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PREPRATION AND EVALUATION OF NATURAL HERBAL LIP BALM

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ABSTRACT

Cosmetics are the substances used to alter the appearance of the human body. Current cosmetic lip products are based on use of toxic chemical ingredients with various adverse effects. Now a days the demands for herbal cosmetics in the world market are increasing leading to usage of natural ingredients for the production of lip balm. In the present work, Lip Balm using papaya as the main ingredient is prepared. The pH of the Lip balm was found to be 7.5 and the melting point was 60˚C - 61˚C. After performing stability studies at room temperature (27.0˚C ± 3.0˚C), refrigerated condition (5.0˚C ± 2.0˚C) and oven temperature (42.0˚C ± 2.0˚C), it proved that prepared Lip balm was uniform in nature, without any deformation at room temperature and refrigeration. The prepared lip balm was evaluated for the parameters such as colour, appearance, odour, pH, patch test, Spreadability, stability and melting point.

KEYWORDS: *Papaya extract, Coconut oil, Almond oil, Beeswax, Vitamin E, Rose oil*

1. INTRODUCTION

Cosmetics play a significant role in today's lifestyle. The trend across various industries, including cosmetics, is shifting towards natural and sustainable practices. Consumers increasingly prefer ingredients derived from natural foods, herbal medicines, and traditional healing methods, reflecting a broader demand for organic vegetable products. Among the widely used cosmetic items are lip care products.

Lip inflammation, characterized by broken, chapped, and painful corners of the mouth, necessitates the use of moisturizers to alleviate discomfort. Dry, cracked lips are a common issue, particularly in harsh weather conditions. While this problem is most prevalent in winter, it can persist throughout the summer as well. Certain ingredients, like menthol, camphor, and peppermint oil, can exacerbate dryness over time.

Herbal extract-based cosmetics are highly regarded for their effectiveness and reliability. For instance, papaya is valued for its anti-inflammatory enzymes that promote healing and its rich content of Vitamin C, a powerful antioxidant.

1.1 Types of Lip Balm

A. Tinted Lip Balm

Tinted lip balm not only moisturizes but also adds color to the lips. It is a great alternative for those who prefer a lighter application compared to lipstick. This balm provides hydration and a subtle, luminous color to the lips.

B. Plumping Lip Balm

Plumping lip balm goes beyond moisturizing by making the lips appear fuller. These balms contain special ingredients designed to enhance the lips' volume while also providing protection and hydration.

C. Medicated Lip Balm

Medicated lip balm is typically prescribed by doctors for treating chapped lips and other lip conditions. Although these balms are less soothing and can be irritating, they are effective for medical use as recommended by dermatologists.

D. Flavored Lip Balm

Flavored lip balm includes various flavorings such as vanilla, mint, mango, and other fruity tastes. These balms are designed to moisturize the lips while offering appealing scents and flavors to enhance the user experience

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E. Organic Lip Balm

Organic lip balm is made from natural or organic ingredients like avocado oil, jojoba oil, beeswax, vitamin E, hemp, and cocoa butter. Unlike other lip balms with chemical ingredients that may harm the lips, organic lip balms provide moisture and protection in a natural way.

2. ADVANTAGES AND DISADVANTAGES OF NATURAL LIP BALM

2.1 Advantages

- Natural lip balms help maintain the natural health and beauty of the lips. They can be used by both men and women and provide protection against cold sores, chapping, and dryness.

2.2 Disadvantages

- Lip balms made with low-quality ingredients can severely damage the lips.
- Homemade lip balms generally do not last as long on the lips compared to commercially-prepared ones.
- Natural oils in lip balms can be greasier and harder to spread.

2.3 Anatomy of the Lips

The anatomy of the lips includes various structures that contribute to their function and appearance:

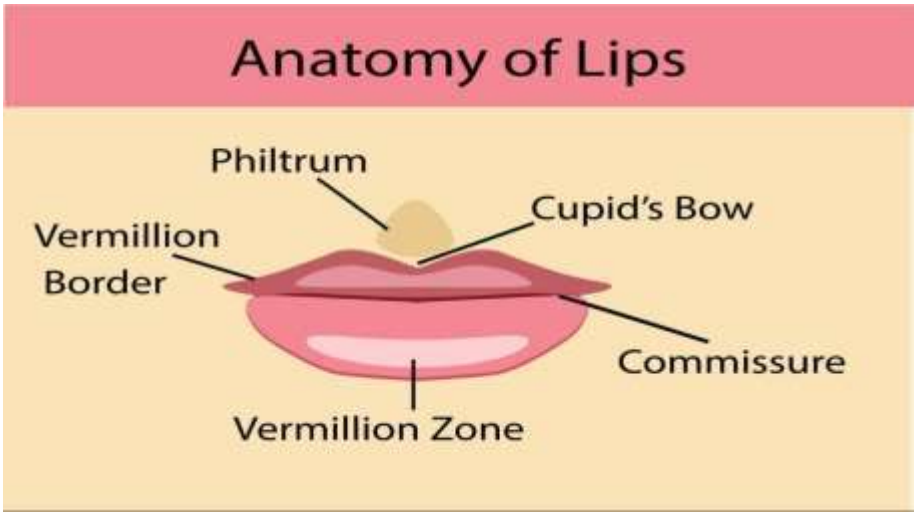


Figure no 1: Anatomy of lips

- **Skin:** The outer layer of the lips is made of skin, which is thinner and more sensitive than the skin on other parts of the body.
- **Vermilion Border:** This is the distinct margin that separates the red-colored vermilion area of the lips from the surrounding skin.
- **Vermilion Zone:** The red area of the lips, which has a high concentration of blood vessels, giving it its color.
- **Philtrum:** The vertical groove or indentation in the center of the upper lip.
- **Cupid's Bow:** The V-shaped area in the center of the upper lip's double curve.
- **Oral Mucosa:** A thin, moist tissue layer covering the inner surface of the lips, helping to keep them moist.
- **Muscles:** The orbicularis oris muscle surrounds the mouth and aids in movements like smiling and puckering.
- **Nerve Endings:** The lips have a high density of nerve endings, making them very sensitive to touch, temperature, and pain.

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3. PROBLEMS RELATED TO LIPS

- Several conditions can affect the lips, including:
- **Cheilitis:** Inflammation, allergies, or irritants causing dry, cracked, and possibly swollen and painful lips.
- **Dry Lips:** Loss of moisture due to environmental factors like cold temperatures, dry air, or frequent lip-licking, leading to tight, cracked, or peeling lips.
- **Chapped Lips:** Severe dryness resulting in painful, bleeding, and uncomfortable lips, often due to prolonged dryness, sun, wind, or harsh weather.
- **Fever Blisters (Cold Sores):** Painful, fluid-filled blisters caused by the herpes simplex virus, often flaring up during stress or illness.
- **Angular Cheilitis:** Inflammation and cracking at the corners of the mouth, possibly due to infections, poor nutrition, or prolonged moisture exposure.
- **Lip Infections:** Bacterial, viral, or fungal infections causing swelling, redness, pain, and pus-filled blisters or sores.
- **Allergic Reactions:** Swelling, itching, redness, and blistering due to allergic reactions to certain foods, cosmetics, or lip care products.
- **Lip Discoloration:** Changes in lip color due to sun exposure, smoking, medications, or underlying health conditions.

3.1 Difference between conventional lip balm and herbal lip balm:

CONVENTIONAL LIP BALM	HERBAL LIP BALM
Conventional lip balm contains petroleum, syntheticwax, alumina, paraben, hydrogenated oils and artificial fragrances which possess harmful effects sometimes.	They are made with natural and organic ingredients, free from synthetic chemicals and additives
Lip balm are often eaten by the users, so the health regulators have toxic effect due to ingredient that goes with lip balm.	They prioritize using plant based oils , butters, and waxes to moisturize and nourish the lips.

4. INGREDIENTS

- **BEESWAX**



Figure no 2: Beeswax

- **PAPAYA EXTRACT**



Figure no 3: Papaya Extract

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- **COCONUT OIL**



Figure no:4 Coconut oil

- **VITAMIN E**



Figure no 5: vitamin E

- **ALMOND OIL**



Figure no 6: Almond oil

- **ROSE OIL:-**



Figure no7: Rose oil

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5. PHARMACOGNOSY OF PAPAYA

- **Biological Name:** Carica papaya
- **Common Names:** Tree melon, papayero, papaw
- **Biological Source:** Papain, a dried and purified latex from the green fruits and leaves of Carica papaya , family Caricaceae. The plant is cultivated in Sri Lanka, Tanzania, Hawaii, and Florida, growing to a height of 5-6 meters and producing fruits up to 30 cm long and weighing up to 5 kg.

Uses

1. Papaya has potent skin-lightening effects due to its exfoliating action and the enzyme papain.
2. Papain helps restore even-toned skin by accelerating the shedding of dead skin cells.
3. The pulp of ripe papaya provides hydration and nutrition to the skin.

5.1 Chemical Constituents

Sr. No:	Ingredients	Chemical condtituents	Uses
1.	Beeswax	Wax ester	Used as a base provides texture create protective barrier
2.	Papaya extract	Carpaine	Moisturize and treat chapped lips
3.	Vitamin e	Alpha- tocopherol	Preservative
4.	Almond oil	Oleic acid 68%	Gives softness
5.	Coconut oil	Fatty acid	Moisturize and nourishes the lips

Table 2: Chemical Constituents

6. BENEFITS OF USING A PAPAYA LIP BALM

Papaya, rich in antioxidants and vitamin A, helps remove dead cells, whiten skin, reduce unwanted hair, exfoliate dead skin, and repair aging skin. The fruit is rich in papain enzyme, vitamins (especially vitamin A), minerals, flavonoids, and fibers.

- **Soothes Inflammation:** Papaya has anti-inflammatory and antioxidant properties that help speed healing and reduce inflammation from allergic reactions, sores, cheilitis, or minor burns.
- **Relieves Itchy Lips:** Calendula in papaya balm helps prevent dermatitis, offering a natural remedy for itchy lips.
- **Heals Skin Barrier:** Supports and hastens the skin's natural reparative process, especially effective when combined with soothing ingredients like beeswax and Vitamin E
- **Locks in Moisture:** Prevents moisture loss, ideal for winter use or as an overnight treatment.
- **Heals Infections:** Papaya has antibacterial and antiviral properties that soothe cold sores and fever blisters, potentially offering relief when combined with other herbs like lemon balm or St. John's wort.

6.1 Application of Natural Lip Balm

- Natural lip balms are used to prevent dryness and protect against environmental factors.
- Numerous chemical-based lip balms are available from brands like The Body Shop, Nivea, Himalaya, Blistex, and Babylip.
- Natural lip balms can be used by both men and women.
- Formulating lip balms requires balancing butters, oils, waxes, and other excipients.
- Since lip balms are often ingested, it is crucial that health regulators closely examine their ingredients.

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7. FORMULATION

Ingredients	Test 1	Test 2
Beeswax	2 gm	10 gm
Papaya extract	2 ml	10 ml
Vitamin e	0.1 gm (1 capsule)	1 gm
Almond oil	3 ml	15 ml
Coconut oil	2 ml	10 ml
Rose oil	2-3 drops	20-24 drops

Table 3: Formulation

7.1 Procedure

- The herbal lip balm is formulated by melting beeswax in a porcelain dish on a water bath. Coconut oil, almond oil, and rose oil are heated in a separate dish, then both phases are mixed at the same temperature. Fresh papaya extract and vitamin E are heated in another dish just before mixing. All contents are combined at 150°C with continuous stirring,
  then transferred to an ice bath to solidify. After cooling, the mixture is homogenized in a mortar and pestle to achieve the desired texture, then molded and refrigerated to cool completely.

Storage and precautions

- Store in a cool, dry place.
- Away from direct heat.

8. EVALUATION PARAMETERS

- To maintain a consistent standard, the formulated herbal lip balm was evaluated for various parameters:

8.1 Physical Appearance: Color, odor, and taste were determined.

8.2 Melting Point: Determined by melting the material to fill capillaries, then immersing in a vial of water with a controlled temperature.

8.3 Spreadability: Tested by applying the product on a glass slide to observe uniformity and integrity.

8.4 Stability: Placed for accelerated stability studies at room temperature (30°C) and oven temperature (40°C to 50°C).

8.5 Skin Irritation Test: Applied on the skin for 10 minutes to check for irritation.

8.6 pH Parameter: Determined using a pH meter calibrated with buffer solution, aiming for a neutral pH close to 7.

9. RESULTS

Evaluation Parameters	Observed Value
Color	Pink
Odour	Pleasant
Melting point	60c
Spreadability test	Good
Stability test	Good
Skin irritancy test	No irritation
PH	7.5

Table No 4: Result

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10. CONCLUSION

This research aimed to create a lip balm using herbal and natural ingredients. The formulation was developed and assessed for its organoleptic properties, as well as other parameters such as pH, spreadability, and melting point. Stability testing indicated that the formulations are safe for use. According to the stability data, the recommended storage temperature for the formulation is between 25°C and 35°C, with a neutral pH of 7 to 7.5. The melting point of the lip balm was found to be 60°C.

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A STUDY ON OCCUPATIONAL STRESS AMONG WOMEN WITH SPECIAL REFERENCE TO BANKING SECTOR

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ABSTRACT
Occupational stress stems from unexpected responsibilities and pressures that do not align with a person's knowledge, skills, or expectations, inhibiting one's ability to cope. It can increase when workers do not feel supported by supervisors or colleagues, or feel as if they have little control over work processes. The need for the study is to ascertain specific problems of employees related to job stress and to find out the level of stress. The present study will help to develop more appropriate strategies to minimize the job stress of employees and these could be incorporated into a well-designed set of human resources policies and also helps as one of the sources for the secondary data for future research also. This study is helpful in assessing the extent of stress experienced by women employees in Banking sector. The population selected for this study are employees of banks mainly women. The sampling population of this study includes 30 women employees from banking sector. Both primary and secondary data were used for the study.
KEY TERMS: *Occupational Stress, Banking Sector*

1. INTRODUCTION

Stress is one of the problems faced by human beings. It has both positive and negative impact on an individual. The positive stress called "Eustress" is required to a certain level to help an individual to perform their work without which the individual will not work. The negative stress called "Distress" has negative impact on the individual, which restricts them in performing their work. It motivates the individual to attend to the task and get rid of the tension or demand the unattended task produced. Stress has become a pervading issue of everyone's life in this modern world. The modern world which is often regarded as a world of achievements has become a world of stress. Be it a family, any social activity or any business organization, stress is everywhere. Right from birth till death, an individual is invariably exposed to various stressful situations. Our economy has shown growth in almost all sectors, but stress has also joined hands with this growth. Individuals under stress are experiencing various psychosomatic and psychological disorders, the feelings of frustration, dissatisfaction with life in general. Workplace stress is the harmful biological reaction that occurs when there is poor match between job profiles and the capabilities, resources, or needs of the worker. These conditions, ultimately affects the job performance and the health of the individuals. But a little amount of stress may prove to be healthy for an organization. With the rising problem of stress, stress management has become very important. Stress Management refers to the wide range of techniques and psychotherapies which can prevent and control an individual's level of stress thereby improving everyday functioning of an individual. Stress management can have any of the three solutions – prevent or control, escape from it, or learn to adapt to it. As it is said that prevention is better than cure, steps should be taken at the initial stage to prevent the stressors rather than curing its harmful effects or bearing heavy costs after being affected by it. Effective stress management can be done at the individual level as well as at the organizational level in various ways.

Stressors: Competition, restructuring and expansion are an inevitable part of every growing industry. There are numerous factors which cause stress among employees like role conflict, uncertainty, insecurity, fears concerning job loss, job changes, compensation, role ambiguity, changes in power, status, prestige, workload, long working hours, technological problem at work, inadequate salary, time for family, job worries at home, group differences and communication. Studies have found that there exists a significant relationship between all these factors and job stress. All these factors can be categorized under four heads which are:

- Organizational Stressors- Inadequate salary, strict rules and regulations, Ineffective communication, Peer pressure, Role conflicts/role ambiguity, centralized organization structure, Less promotional opportunities, Lack of employees participation in decision-making, authoritative leadership, changes in power, status, prestige, workload, long working hours, technological problem at work.

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- Individual Stressors - Expectations which the family members, colleagues, superior and subordinates have from the employee creates a pressure amongst individuals. Failure to fulfil these expectations causes employee stress. Other individual factors causing stress among employees are inherent personality traits such as being impatient, aggressive, rigid, home group differences, lack of rewards, praise, no autonomy in the task etc. Similarly, the family issues, financial problems, changes in job profile all lead to stress.
- Job Stressors - Monotonous nature of job, insecure environment, unhealthy working conditions, Lack of confidentiality, Crowding.
- Extra-organizational Stressors - Changes in Government policy, economic policy, regulations by RBI. Social changes, obsolete technology are the extra-organizational factors causing stress.

2. STATEMENT OF THE PROBLEM

Every sector has policies to achieve its objectives. Continuous updating and monitoring of these policies should be essential to keep pace with changing in time to avoid any type of stress on the part of the employees. To study the work stress of the employees in Banking sector, it is mainly focused on various factors which are directly or indirectly related to the nature of work. These factors include design of tasks, management styles, inter-personal relations, workload, career concerns and environmental conditions. The need for the study is to ascertain specific problems of employees related to job stress and to find out the level of stress. The present study will help to develop more appropriate strategies to minimize the job stress of employees and these could be incorporated into a well-designed set of human resources policies and also helps as one of the sources for the secondary data for future research also.The level of stress faced by employees in Banking sector is not new. During the past few years banking sector have undergone tremendous changes. In a competitive environment, every sector is interested to improve its position to get a strong base for its survival. To attract the customers to large number and to improve the market share as well as profits these sectors adopt various strategies downsizing, excessive working hours, introduction of new technologies, new plans, etc. Due to these factors the employees are experiencing high level of stress and it has become their integral part of living. Stress at work can be a real problem to the organization as well as for its workers. Good management and good work organization are the best forms of stress prevention. This study is helpful in assessing the extent of stress experienced by women employees in Banking sector.

3. OBJECTIVES OF THE STUDY

- To identify the main factors related to Occupational stress.
- To analyse how stress factors affect women employees in Banking sector
- To study the relationship between stress and the variables that creates stress.
- To identify the measures to be taken to reduce Occupational stress.

4. RESEARCH METHODOLOGY

Both descriptive and explanatory research methodologies are adopted in this project. This is because job stress which is the main concept of this project cannot be quantified nor captured by a single research method. A project of this nature requires a wide collection of opinions of the subject matter and one of the ways of achieving this is through the administration of questionnaires. The items that are given in the questionnaire are used to measure job control, psychological demands, job insecurity, physical exertion and workplace social support. Each item on the standardized questionnaire shall be scored using a five-point Likert scale from strongly agree to strongly disagree. The population selected for this study are employees of banking sector mainly women. The sampling population of this study includes 30 women employees. Data was collected using mainly two methods, i.e. Primary data and Secondary data. Respondents of Banking sector suffer from headache and migraine, followed by Hypertension, Obesity and Depression and Anxiety. Thus, it is much evident that if the factors of stress are not properly controlled and monitored it can hamper the organizational structure.

5.MAJOR FINDINGS OF THE STUDY

Work life imbalance and unmatched expectations are the major causes of stress in Banking sector followed by work environment. Most of the women employees of Banking sector handle their stress situation by spending time with their family. It is said that 56% of the women employees are affected due to the environment in which the person works, so changes in work environment itself can help to reduce stress. It is found that the management plays a major role in handling stress situation. To a certain extent, the management is efficient in handling stress problems. 23% of the respondents say that watching TV is a technique to reduce stress which is followed by physical exercise, yoga, modified working environment and time management. By providing good working environment, continuous training, proper communication and conducting effective Stress management programs helps in reducing stress. The suggestions given by employees are taken into consideration in most of the cases.

6.IMPLICATIONS

1. Physical problems and Health problems: Like heart diseases, ulcers, arthritis, increased frequency of drinking and smoking, cardiovascular, gastrointestinal, endocrine and other stress related disorders.

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2. Psychological and Behavioural problems: Psychological problems like change of moods, inferiority complex, widespread resentment, reduced aspirations and self-esteem, reduced motivation and job skills.
3. Organizational problems: Job dissatisfaction, behavioural problems, production turnover, increased absenteeism, increased accidents, lower productivity.

7.CONCLUSIONS OF THE STUDY

Due to rapid change in the technology and widening of national frontiers the very core of existence lies on the mantra of survival of fittest. Employees of Banking sector are working in stressful environment due to rapidly changing environment for competition and survival. As a result, employees feel stressed and are not satisfied with their job. And therefore they will not feel happy with working in their respective sector for a long time. Hence, it is the responsibility of human resources managers to find out the reason , Why employees are not happy with their jobs, and also to investigate and understand and what makes employees to feel stress.

Finally, it is the responsibility of both management and employees when it comes to the issue of handling stress. When an employee is handling stress, as a result of both internal and external environments, it is the management and customers that will experience the effect of stress experienced by employees. Hence, Personal managers must consider suitable concrete measures to maintain stress free environment in all the three sectors. The productivity of the work force is the most decisive factor as far as the success of an organization is concerned. The productivity is in turn dependent on the psycho-social well-being of the employees. Although certain limitations were met with the study, every effort has been made to make it much comprehensive.To alleviate the negative consequences of stress, more effort on the part of policy makers, practitioners and organizational management envisaged. The author, hereby making a few efforts to suggest some effective measures that can alleviate the stress of employees and lead to their better adjustment within the organization. They can be detailed as follows:

Stress Management Program: Organize a Stress Management Program that focuses on different categories of employees at all hierarchical level. Many situational observations of employee-employer interaction identified within the organization can lead to stress at work. A successful stress management training program requires the involvement and support of top officials and the cooperation from employees. It depends upon a clear plan, on-going evaluation of progress, and clear goals for measuring success.

Stress Management Strategies

1. Take adequate steps to redesign jobs, which are taxing to employee's abilities and capacities.
2. Encourage the cross functional and inter-departmental work arrangements to reduce work related stress among low performers and low achievers.
3. Adequate role clarification to be made whenever necessary to eliminate role ambiguity.
4. Introduce more job oriented training programs, which improve employee's skills and their confidence to work effectively.
5. Encourage open channel of communication to deal work related stress.
6. Adequate resources i.e. material, technical and human should be extended to make employee feel safe and secure to perform their work effectively.
7. Ensure justified use of grievance handling procedures to win trust and confidence of employees and reduce their anxiety and tension related to job related problems.
8. Provide counselling on work related and personnel problems and support from a team of welfare health and counselling staff.
9. Attractive system of reward and recognition of good work.
10. Effective follow up should be made to different leave category absentee employees.
11. Organization should organize regular check-up and those found suffering from very high stress should be subjected to stress management process.
12. Cut back excessive hours, which directly affect the employee's physical fitness.

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IMPACT ON YOGIC PRACTICE WITH PRANAYAMA ON SELECTED RESPIRATORY PARAMETERS AMONG OVERWEIGHT CHILDREN IN COIMBATORE DISTRICT

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ABSTRACT

The rising prevalence of overweight individuals has shifted societal perspectives on lifestyle and health. This issue extends beyond aesthetics, impacting both mental and physical well-being, and increasing risks for chronic diseases. Understanding and addressing overweight requires a comprehensive approach that includes lifestyle changes, nutritional education, and mental health support. Yogic practices, especially pranayama, integrate physical postures and controlled breathing techniques to enhance overall well-being. By promoting mental clarity, physical strength, and emotional balance, these practices offer a holistic approach to health, fostering harmony between mind, body, and spirit.

***Objective**: The motive of this study was to investigate impact on yogic practice with pranayama on selected cardiorespiratory parameters among overweight children in coimbatore district.*

***Methodology**: The purpose of the study was to determine the impact on yogic practice with pranayama on selected respiratory parameters among overweight children in coimbatore district. Two hundred overweight boys and girls were selected from various schools in Coimbatore district, Tamil Nadu, India Among the 100 subjects were divided into two experimental groups and two control group with fifty subjects (N=50) in each group. Experimental group I (YPPBG=50) underwent yogic practices with pranayama for boys and experimental group II (YPPGG =50) underwent yogic practices with pranayama for girls for a period of thirty six weeks, for three alternate days in a week, the workout lasted for 50 minutes approximately and Control group boys III (CGB=50) and Control group girls IV (CGG=50) do not undergo any sort of training except their routine. The data analysis was conducted using the dependent 't' test, and a confidence level of 0.05 was used to determine statistical significance.*

***Results**: The results indicate that there was a significant difference between the yogic practices with pranayama for boys and girls groups compared to their respective control groups, Suggesting that the yogic practices with pranayama had an impact on the overweight children. Specifically, the children who underwent the yogic practices with pranayama showed improvements in their respiratory parameters.*

***Conclusion**: The yogic practices with pranayama can significantly improve respiratory parameters among overweight children. The findings provide evidence that training programs that are tailored to the demands of the yogic practices with pranayama can be more effective in enhancing their respiratory performance than control group. This study provides valuable insights into the importance of yogic practices with pranayama for improving respiratory parameters, such as namely slow vital capacity, forced vital capacity, maximum voluntary ventilation, expiratory reserve volume and heart rate in overweight children.*

KEY WORDS: *Yogic Practices, Pranayama, Respiratory Parameters and Overweight.*

INTRODUCTION

The prevalence of overweight individuals has shifted societal views on lifestyle, nutrition, and well-being, raising serious health concerns. This issue goes beyond aesthetics, impacting mental and physical health and increasing risks for chronic diseases like diabetes and cardiovascular disorders. The rise in overweight is driven by sedentary lifestyles, high-calorie diets, and environmental factors. Hereditary, socioeconomic, and environmental influences interact in complex ways, necessitating a comprehensive understanding that includes mental health support, nutritional education, and societal norm reassessment. Obesity is now a global epidemic, not limited to wealthy societies. The WHO highlights obesity's multifaceted effects as a major public health challenge. Modern eating patterns favoring processed, high-calorie foods and reduced physical activity due to urbanization and technological advancements contribute significantly. Environmental and socioeconomic factors also play crucial roles, with lower-income communities often lacking access to healthy foods and safe recreational spaces. Addressing obesity requires a holistic approach considering both individual behaviors and broader societal factors.

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Yoga, rooted in Indian philosophy, has evolved into a globally respected practice promoting mental, physical, and spiritual well-being. Beyond physical postures, yoga fosters harmony between mind, body, and spirit. It enhances flexibility, strength, and balance through various poses and movements. Additionally, mindful breathing and meditation techniques in yoga reduce stress and promote relaxation. Yoga offers numerous health benefits, including lowered blood pressure, improved cardiovascular health, and strengthened immunity. Its meditative aspects enhance inner connection and self-awareness, fostering composure and resilience. Adaptable to different lifestyles and fitness levels, yoga provides a sanctuary from modern life's pace. It promotes holistic health and harmonious coexistence of body, mind, and spirit, making it suitable for both beginners and experienced practitioners.

METHODOLOGY

Participation: The purpose of the study was to determine the impact on yogic practice with pranayama on selected cardiorespiratory parameters among overweight children in coimbatore district. To reach the goal of the study, Two hundred overweight boys and girls were selected from various schools in Coimbatore district, Tamil Nadu, India Among the 100 subjects were divided into two experimental groups and two control group with fifty subjects (N=50) in each group. Experimental group I (YPPBG=50) underwent yogic practices with pranayama for boys and experimental group II (YPPGG =50) underwent yogic practices with pranayama for girls for a period of thirty six weeks, for three alternate days in a week, the workout lasted for 50 minutes approximately and Control group boys III (CGB=50) and Control group girls IV (CGG=50) do not undergo any sort of training except their routine. The data analysis was conducted using the dependent 't' test, and a confidence level of 0.05 was used to determine statistical significance.
Criterion Measures: It is evaluated the respiratory parameters where chosen as the criterion measures to this study for testing.

TABLE - 1
CRITERION MEASURES

S.No	VARIABLES	TESTS	UNIT OF MEASUREMENT
RESPIRATORY PARAMETERS			
1.	Slow Vital Capacity.	Digital Spiro Meter	Measure In Litres
2.	Forced Vital Capacity		
3.	Maximum Voluntary Ventilation		
4.	Expiratory Reserve Volume		
5.	Heart Rate	Pulse Oximeter	In Counts

Statistical Methods; The collected data before and after training period of thirty six weeks on the above said parameters due to the yogic practices with pranayama for school children was statistically analyzed with't' test to find out the significant improvement between pre and post-test. In all cases the criterion for statistical significance was set at 0.05 level of confidence. (P<0.05).

TABLE – II
THE T- RATIO FOR YOGIC PRACTICE WITH PRANAYAMA FOR BOYS GROUP AND CONTROL GROUP BOYS ON RESPIRATORY PARAMETERS

Variables	Group	Test	Mean	SD	SEM	t-ratio
Slow Vital Capacity (Measure In Litres)	YPPBG	Pre Test	1.45	0.19	0.03	4.82*
		Post Test	1.58			
	CGB	Pre Test	1.44	0.03	0.01	0.45
		Post Test	1.44			
Forced Vital Capacity (Measure In Litres)	YPPBG	Pre Test	3.65	0.21	0.03	4.51*
		Post Test	3.79			
	CGB	Pre Test	3.63	0.13	0.02	0.52
		Post Test	3.64			
Maximum Voluntary Ventilation (Measure In Litres)	YPPBG	Pre Test	82.98	5.15	0.73	7.20*
		Post Test	88.22			
	CGB	Pre Test	82.48	2.05	0.02	0.78
		Post Test	82.52			
Expiratory Reserve Volume	YPPBG	Pre Test	0.93	0.11	0.01	5.04*
		Post Test	1.01			
	CGB	Pre Test	0.89	0.11	0.02	0.78

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(Measure In Litres)		Post Test	0.91			
Heart Rate (In Counts)	YPPBG	Pre Test	75.92	5.37	0.76	2.32*
		Post Test	74.16			
	CGB	Pre Test	76.14	5.78	0.82	0.47
		Post Test	76.52			

*Note: YPPBG- Yogic Practices with Pranayama for Boys Group, CGB- Control Group Boys. Significance at 0.05 level of confidence for df of 49 is 2.01.

Mean, standard deviation and t-value were calculated for each outcomes measure can be found in Table-II result shows that the pre-test mean values of yogic practices with pranayama for boys group and control group boys (1.45,3.65,82.92,0.93,75.92) and (1.44,3.63,82.48,0.89,76.14) respectively and the post-test mean values are(1.58,3.79,88.22,1.01,74.16) and (1.44,3.64,82.52,0.91,76.52) respectively. The obtained dependent t-test value on slow vital capacity (t=4.82*), forced vital capacity (t=4.51*), maximum voluntary ventilation (t=7.20*), expiratory reserve volume (t=5.04*) and heart rate (t=2.32*) of game yogic practices with pranayama for boys group respectively. The table value required for significant difference with degrees of freedom 49 at 0.05 level of confidence. The obtained 't' test value of yogic practices with pranayama for boys group was greater than the table value 2.01. The results clearly indicated that the slow vital capacity, forced vital capacity, maximum voluntary ventilation, expiratory reserve volume and heart rate of the yogic practices with pranayama for boys group improved due to impact on yogic practice with pranayama on selected cardiorespiratory parameters among overweight children in coimbatore district.

TABLE – III
THE T- RATIO FOR YOGIC PRACTICE WITH PRANAYAMA FOR GIRLS GROUP AND CONTROL GROUP GIRLS ON RESPIRATORY PARAMETERS

Variables	Group	Test	Mean	SD	SEM	t-ratio
Slow Vital Capacity (Measure In Litres)	YPPGG	Pre Test	1.26	0.08	0.01	7.65*
		Post Test	1.35			
	CGG	Pre Test	1.23	0.05	0.05	0.38
		Post Test	1.23			
Forced Vital Capacity (Measure In Litres)	YPPGG	Pre Test	3.06	0.07	0.01	7.54*
		Post Test	3.13			
	CGG	Pre Test	3.03	0.06	0.01	1.37
		Post Test	3.02			
Maximum Voluntary Ventilation (Measure In Litres)	YPPGG	Pre Test	69.22	3.64	0.52	6.83*
		Post Test	72.74			
	CGG	Pre Test	68.56	3.27	0.46	1.08
		Post Test	68.06			
Expiratory Reserve Volume (Measure In Litres)	YPPGG	Pre Test	0.83	0.03	0.00	6.08*
		Post Test	0.85			
	CGG	Pre Test	0.81	0.03	0.00	0.60
		Post Test	0.80			
Heart Rate (In Counts)	YPPGG	Pre Test	75.88	1.57	0.22	5.26*
		Post Test	74.70			
	CGG	Pre Test	75.92	2.77	.039	0.05
		Post Test	75.94			

*Note: YPPGG- Yogic Practices with Pranayama for Girls Group, CGG- Control Group Girls. Significance at 0.05 level of confidence for df of 49 is 2.01.

Mean, standard deviation and t-value were calculated for each outcomes measure can be found in Table-II result shows that the pre-test mean values of yogic practices with pranayama for girls group and control group girls (1.26,3.06,69.22,0.83,75.88) and (1.23,3.03,68.56,0.81,75.92) respectively and the post-test mean values are (1.35,3.13,72.74,0.85,74.70) and (1.23,3.02,68.06,0.80,75.94) respectively. The obtained dependent t-test value on slow vital capacity (t=7.65*), forced vital capacity (t=7.54*), maximum voluntary ventilation (t=6.83*), expiratory reserve volume (t=6.08*) and heart rate (t=5.26*) of yogic practices with pranayama for girls group respectively. The table value required for significant difference with degrees of freedom 49 at 0.05 level of confidence. The obtained 't' test value of yogic practices with pranayama for girls group was greater than the table value

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2.01. The results clearly indicated that the slow vital capacity, forced vital capacity, maximum voluntary ventilation, expiratory reserve volume and heart rate of the yogic practices with pranayama for girls group improved due to impact on yogic practice with pranayama on selected cardiorespiratory parameters among overweight children in coimbatore district.

FIGURE-I BAR DIAGRAM SHOWING THE MEAN VALUES OF PRE AND POST-TEST ON SLOW VITAL CAPACITY, FORCED VITAL CAPACITY, MAXIMUM VOLUNTARY VENTILATION AND EXPIRATORY RESERVE VOLUME OF YPPBG AND CGB

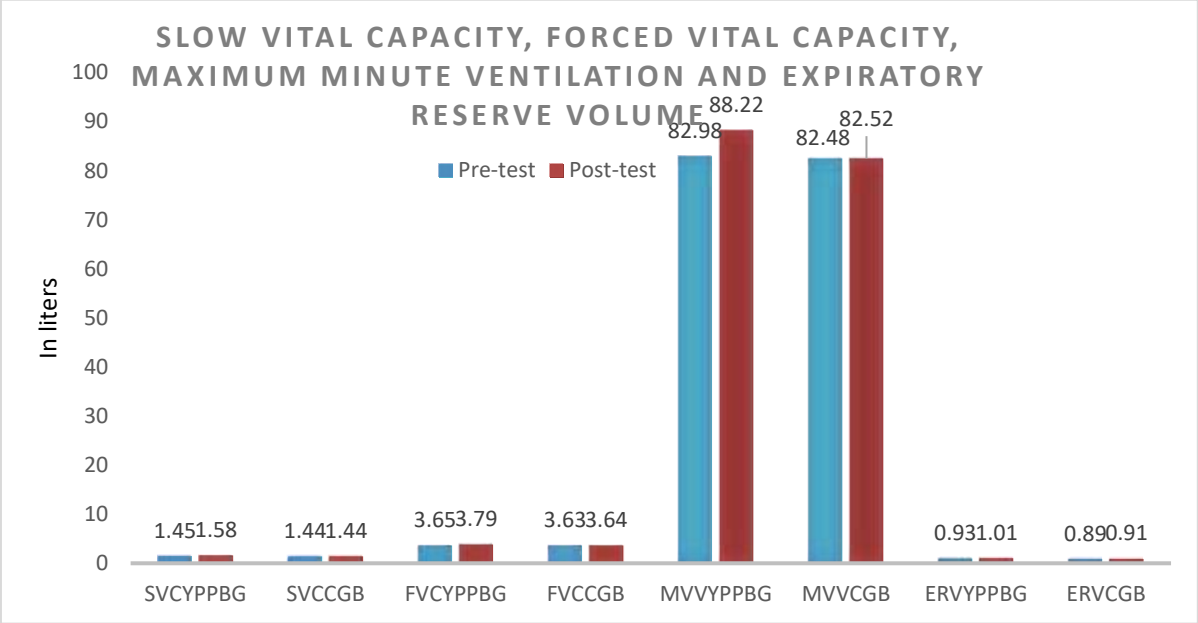
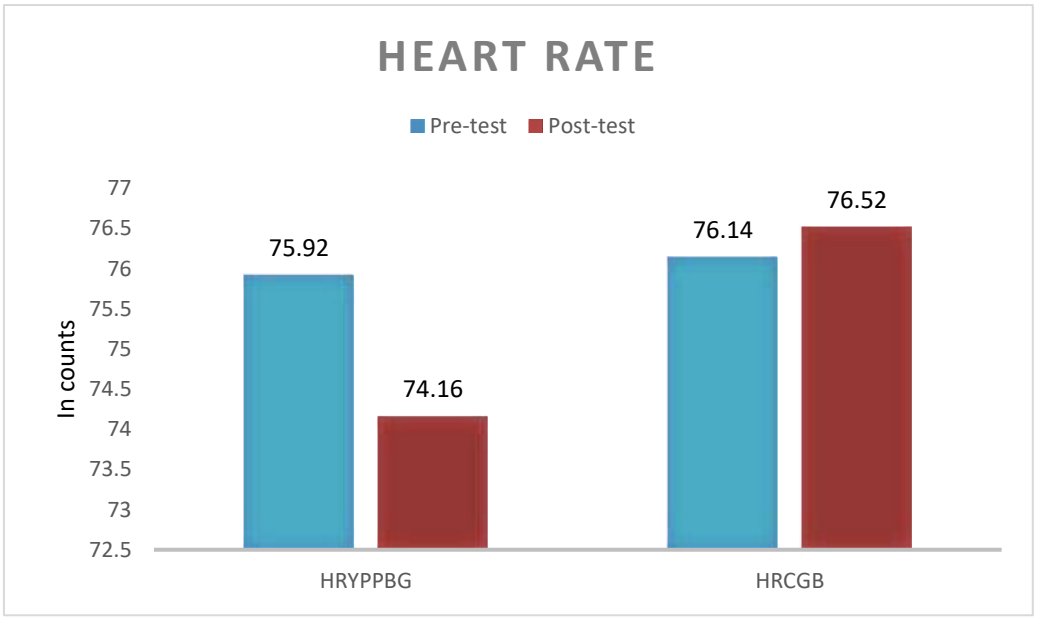


FIGURE-2 BAR DIAGRAM SHOWING THE MEAN VALUES OF PRE AND POST-TEST ON HEART RATE OF YPPBG AND CGB



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FIGURE-3 BAR DIAGRAM SHOWING THE MEAN VALUES OF PRE AND POST-TEST ON SLOW VITAL CAPACITY, FORCED VITAL CAPACITY, MAXIMUM VOLUNTARY VENTILATION AND EXPIRATORY RESERVE VOLUME OF YPPGG AND CGG

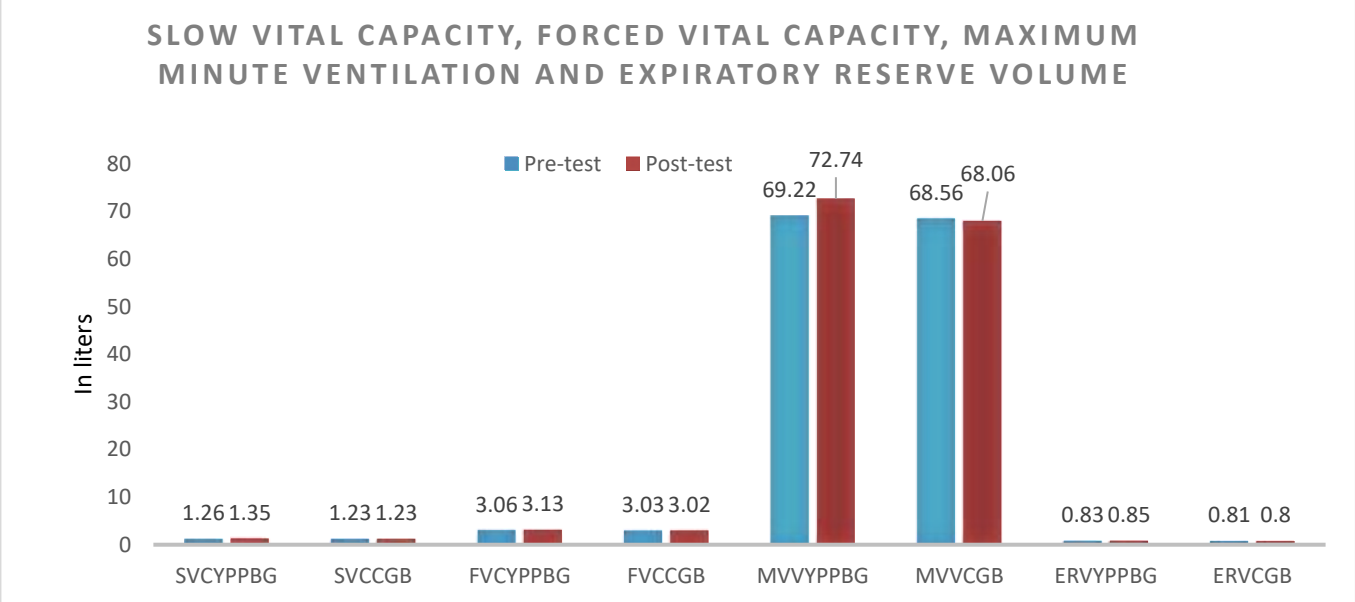
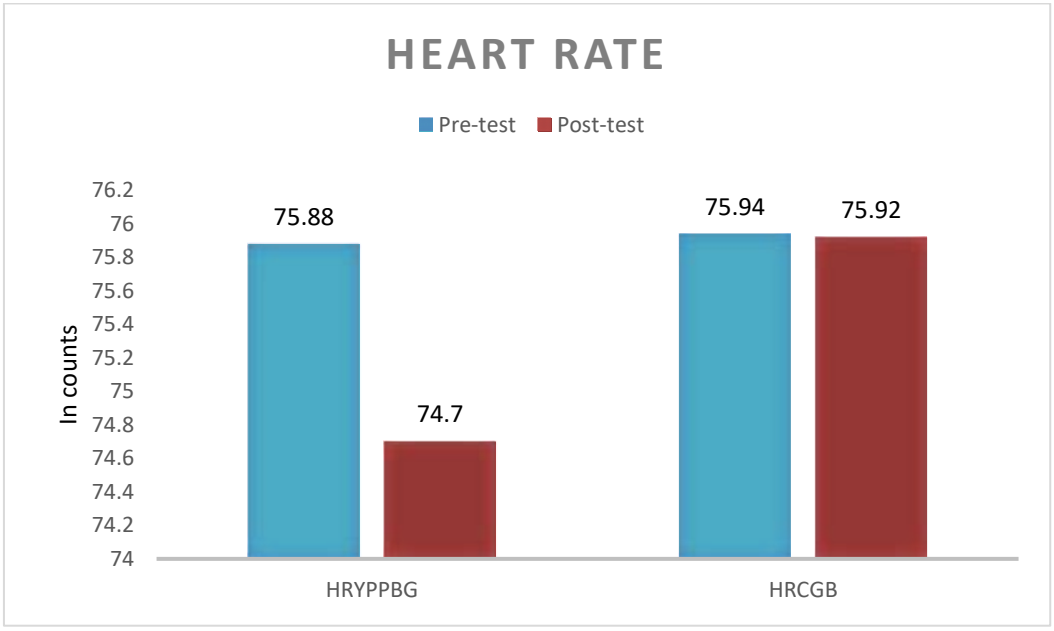


FIGURE-4 BAR DIAGRAM SHOWING THE MEAN VALUES OF PRE AND POST-TEST ON HEART RATE OF YPPGG AND CGG



DISCUSSION ON FINDINGS

Based on the results, the yogic practices with pranayama for boys and girls group demonstrated significantly improved respiratory parameters, such as namely slow vital capacity, forced vital capacity, maximum voluntary ventilation, expiratory reserve volume and heart rate. The improvement was found to be caused by yogic practices with pranayama for boys and girls when compared to the control group. This study suggests that the yogic practices with pranayama for boys and girls had a positive impact on the development of respiratory parameters can be an effective approach to enhancing performance in these areas. Thus, the results are in line with other study of which has emphasized the effect of yogic practices and aerobic training on selected lung functions among physical education students .Results shows that there was a significant difference among experimental and control groups on slow vital capacity. **Palanisamy, A. (2020),** It was observed that the twelve weeks of yogic practices have significantly improved the selected lung functions of physical education students.

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From present study it can be concluded that regular practice of pranayama mainly improves respiratory efficiency as seen by highly significant in respiratory parameters. It also improves cardiac efficiency as indicated by significant decrease in pulse rate & highly significant increase in 40 mmHg endurance time. There was significant decrease in RR while FVC, MVV were significantly increased in subjects after the practice of pranayama **Waghmare, P et al., (2013).** ERV, which measures the additional air that can be forcibly exhaled after normal expiration, showed a considerable increase. This suggests that pranayama practices have strengthened the expiratory muscles, contributing to more effective and efficient breathing patterns. **Bal, B. S. (2015),** This study have significant differences were found in expiratory reserve volume (ERV), inspiratory reserve volume (IRV) in experimental group of university level girls.

The results are in line with other study of which has highlighted the Effect of yogic practice and aerobic exercise on selected physical and physiological variables among overweight school boys. Results show that asana, pranayama and asanas with pranayama practices group influence expiratory reserve volume when compared with the control group. Asana with pranayama practices may have a better influence on the expiratory reserve volume of obese men **Yokesh, T. P., & Chandrasekaran, K. (2011)**.

Kalwale, P et al., (2013) the present study shows that one month of pranayama training produces a significant decrease in pulse rate. The decrease in pulse rate may have been brought about by increased parasympathetic and decreased sympathetic activity.

CONCLUSION

Yogic practices with pranayama plays a vital role in improving the respiratory parameters of overweight children. The study revealed significant improvements in Slow Vital Capacity (SVC), Forced Vital Capacity (FVC), Maximum Voluntary Ventilation (MVV), and Expiratory Reserve Volume (ERV) among the experimental groups. These findings suggest that pranayama is highly effective in enhancing lung capacity and respiratory muscle strength. The controlled breathing techniques fundamental to pranayama likely contribute to greater lung expansion, increased elasticity, and overall improved respiratory efficiency. Additionally, there was a significant decrease in resting heart rate, indicating enhanced cardiovascular efficiency and better autonomic regulation. Pranayama practices, especially those involving deep, slow breathing, promote increased parasympathetic activity, resulting in a calmer and more efficient heart function.

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INDIVIDUALIZED MEDICINE: REVOLUTIONIZING HEALTHCARE WITH TAILORED THERAPIES

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ABSTRACT

Individualized medicine is changing the way as we approach the healthcare by customizing the medical treatments to fit each person's unique genetic makeup, environmental influences, and to lifestyle choices. This concept focuses on the idea of that every patient is unique, but with genetic differences that influence their health and how they respond to the treatments. By using advanced technologies such as genomics (the study of genes and their functions), proteomics (the study of proteins and their functions), and the detailed patient data, precision medicine allows doctors to identify an specific genetic markers and molecular causes of diseases. With this information, the healthcare providers can create personalized treatment plans that target the exact causes of an illnesses, making the treatments more effective and reducing the side effects. We already have seen the benefits of precision medicine in the cancer treatment, where specific therapies designed to target specific genetic mutations have significantly improved patient outcomes. However, the potential of precision medicine extends far beyond the oncology. It could revolutionize the treatment of heart diseases, neurological disorders, rare genetic conditions, and many other health issues. Despite its promise, the precision medicine faces challenges like ensuring data security, addressing the ethical concerns, and providing equal access to such advanced treatments. Nevertheless, the future of the precision medicine looks bright. It aims to create a healthcare system that is more focused on the individual patients, providing treatments tailored to each person's unique biology and requirement. This approach is expected to lead to a more better health outcomes with a higher quality of life for many people.

INTRODUCTION

Individualized medicine, precision medicine, personalized treatment.

Individualization of Healthcare

Precision medicine is founded on the idea that every patient is a unique, and their genetic, environmental, and their lifestyle factors play a crucial role in their health. This approach moves away from the traditional one-size-fits-all model of the healthcare.

Precision Medicine

Precision medicine is revolutionizing the healthcare by fundamentally changing how the medical treatments and interventions are designed, developed, and administered. This groundbreaking approach is based on the understanding that each person is biologically unique, with genetic, environmental, and lifestyle factors that significantly influence their health and response to treatments. This introduction delves into the essence and importance of precision medicine, highlighting its transformative potential. At its core, precision medicine rejects the outdated one-size-fits-all approach to healthcare. Instead, it leverages the advanced of technologies like genomics, proteomics, and personalized diagnostics to uncover the specific genetic markers and molecular drivers of specific diseases. With this knowledge, healthcare providers can create personalized treatment plans that target the main root causes of illnesses with unmatched precision, improving therapeutic effectiveness while minimizing the side effects.

The significant impact of precision medicine is already evident in the cancer treatment, where targeted therapies have an dramatically improved patient outcomes by focusing on the specific genetic mutations. However, its applications extend beyond oncology, with the potential to revolutionize the management of cardiovascular diseases, neurological disorders, and rare genetic conditions, and more. Despite its promise, precision medicine also brings challenges such as data privacy, ethical considerations, and equitable access to advanced therapies. Nonetheless, as technology progresses and our understanding of human biology deepens, precision medicine is set to become a cornerstone of 21st-century healthcare. This approach promises a future where healthcare is increasingly individualized, ensuring that each patient receives a treatments tailored precisely to their unique biological makeup, leading to a better health outcomes and a higher quality of life. The following sections will discuss the key parameters in more detail.

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Targeted Therapies
Targeted therapies are a key element of precision medicine, which tailors treatments based on an individual's unique genetic and molecular makeup. These therapies specifically target the genes, proteins, or pathways that drive diseases like cancer. By focusing on a patient's specific genetic alterations, targeted therapies aim to increase the treatment effectiveness, reduce side effects, and improve overall outcomes. In the era of personalized medicine, these therapies provide an more precise and efficient treatment options for a wide range of diseases. Precision medicine enables the healthcare providers to create highly customized treatment plans that address the specific causes of a diseases with greater accuracy, enhancing treatment efficacy while minimizing the risk of adverse effects.

Genetic profiling
Genetic profiling, also known as DNA fingerprinting, is a technique that analyzes a person's unique DNA to identify the genetic variations, such as DNA sequences and the number of repeats at specific loci. This method is widely used for purposes like forensic investigations, paternity testing, and identifying an genetic disorders. By comparing genetic profiles, scientists can determine a relationships, establish identities, and assess the risk of inherited diseases. This powerful tool is essential in the modern genetics and criminal justice due to the uniqueness of an individual's DNA. In precision medicine, advanced genetic profiling is crucial for understanding a person's genetic makeup. By examining a patient's DNA, healthcare providers can pinpoint specific genetic markers and variations that may impact their health and response to treatments. This approach allows for more personalized and an effective healthcare.

Technological Advancements
Precision medicine depends on the advanced technologies like genomics, proteomics, bioinformatics, and data analytics. These technologies allow the healthcare providers to gain a thorough understanding of an individual's health and their genetic makeup.

Patient-Centered Care
Precision medicine embraces a patient-centric approach, emphasizing the importance of involving a patients in decision-making, tailoring treatments to their specific needs, and it offering a higher level of care customization.

Future Prospects of Precision Medicine
Precision medicine is set to revolutionize the healthcare in the coming years. The following sections discuss its promising future prospects:

Personalized Treatments
As genetic and molecular profiling becomes more accessible and affordable, personalized treatments will become more common. Therapies tailored to a patient's unique genetic makeup will lead to more effective and an targeted interventions.

Early Disease Detection
Precision medicine allows for the identification of a genetic markers and biomarkers for early disease detection, enabling proactive and preventative healthcare strategies. This can significantly improve the patient outcomes and reduce healthcare costs.

Pharmacogenomics:
Advancements in pharmacogenomics will result in the development of drugs that specifically matched to a patient's genetic profile, minimizing adverse reactions and enhancing the drug efficacy.

Challenges
Precision medicine faces several challenges, including ensuring equitable access to advanced treatments, addressing ethical dilemmas related to genetic information, and providing adequate training for the healthcare professionals in genomics and in personalized medicine.

Expanding Beyond Oncology:
While precision medicine has made significant strides in cancer treatment, it also holds promise for other areas such as the cardiovascular diseases, neurological disorders, rare genetic conditions, and many of other illnesses.

Rare Disease Research:
Precision medicine will significantly benefit individuals with rare diseases by identifying the underlying genetic causes and by developing targeted therapies, offering hope to previously underserved patient populations.

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Global Collaboration:
International cooperation and data sharing will facilitate larger-scale research and the discovery of novel treatments. Genomic databases and international networks will promote knowledge exchange and will accelerate progress.

Ethical and Regulatory Frameworks:
Continued development of ethical and regulatory guidelines is essential to address privacy concerns, consent issues, and ensure the equitable access to precision medicine.

Data Integration and AI:
Integrating patient data—including genomic, clinical, and environmental information—with the power of artificial intelligence will lead to a more accurate disease risk assessments and treatment recommendations.

CONCLUSION:

Precision medicine is revolutionizing healthcare by personalizing medical treatments and the interventions based on each patient's unique genetic, environmental, and lifestyle factors. This emerging field holds great promise for improving the healthcare outcomes. By tailoring treatments to individual needs, precision medicine can enhance therapeutic effectiveness, reduce side effects, and increase the patient satisfaction. Through genomic profiling and advanced diagnostics, healthcare providers can identify genetic predispositions and biomarkers associated with such various diseases. This enables early detection and intervention, increasing the chances of successful treatment. Precision medicine is particularly impactful in cancer treatment, where understanding individual tumor characteristics helps determine the most effective drugs and strategies.

However, to implement precision medicine on a broader scale, challenges such as data privacy, accessibility, and affordability must be addressed. Additionally, healthcare professionals need specialized training to interpret the genetic data and make informed treatment decisions. As technology advances and data-sharing becomes more secure, precision medicine is set to play a crucial role in the improving healthcare outcomes and reducing the burden of disease on individuals and society. The future of healthcare lies in tailoring treatments to individuals, maximizing the potential for better, more of a personalized care.

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REVOLUTIONIZING MATH EDUCATION: THE IMPACT OF MULTIMODAL TEACHING APPROACHES

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ABSTRACT
Multimodal experiences are critical for learning in the twenty-first century, particularly those that focus on improving a learner's capacity to generate and analyze visual texts. This study used a quasi-experimental design to investigate the efficacy of a multimodal teaching technique in enhancing Grade 4 pupils' Math performance. The null hypothesis that there is no significant difference between the posttest mean score of the experimental and comparison groups is rejected, implying that the experimental comparability to the comparison group improves significantly after the posttest. Furthermore, the null hypothesis that there is no significant difference between the pretest and posttest results of the comparison group is rejected, implying that the comparison group's scores improve from pretest to posttest, as does the experimental group's. However, there is a significant improvement in the experimental group, indicating that the intervention is more effective than traditional teaching methods. The study's recommendations are as follows: teachers should continue to use multi-modal teaching approaches in their classrooms; education officials and school administrators should encourage teachers to support teachers by providing materials and professional development training in multimodal teaching approaches; and future researchers should develop and evaluate other potential characteristics or variables related to multimodal teaching approaches.
KEYWORDS: *Multimodal Teaching Approach, Grade 4 Mathematics, Quasi-Experimental Research Design, Pedagogy*

I. INTRODUCTION

Teaching is the term used to describe the act of imparting information or skills to another person (Rajagopalan, 2019: Escalaw, 2022). Giving can relate to imparting knowledge or sharing personal experiences, such in a lecture. Both art and science are viewed as important in teaching. It highlights the teacher's creativity and originality in setting up an engaging environment for students to study in the classroom. It is a science that sheds light on the rational, mechanical, or procedural steps that must be followed to guarantee successful goal attainment. Different teachers have different viewpoints on the teaching idea. Moreover, according to Paynor (2024) and Escalaw (2021) teaching is the purposeful exchange of information and experience, often structured within a field, and, more broadly, it is the act of promoting the psychological and intellectual growth of another person or a piece of artifice.

Multimodal teaching strategies use a variety of approaches and instruments to give education while accommodating diverse learning styles and preferences (Paynor, 2024). Multimodal teaching uses visual, auditory, kinesthetic, and textual elements to enhance understanding and retention, creating an inclusive, effective educational experience that accommodates diverse student needs (Paynor, 2024). Additionally, lessons are organized from fundamental to complex competencies, it is essential to ensure learners have a firm grasp of fundamental skills before moving on to more advanced competencies (Escalaw, 2021; Torres, 2021; Escalaw, 2022;. If this isn't done, tht4eacere might be learning gaps that prevent pupils from picking up new knowledge and abilities in later classes (Torres, 2021). Differentiated instruction is nevertheless beneficial for raising student achievement in math and other disciplines, despite these obstacles.

To address this issue, educators and schools employ strategies including tailored education, extra help for kids who need it, and the use of technology to enable remote learning. Notwithstanding the difficulties, it is critical to give closing the mathematics learning gap top priority in order to provide students with the skills they will need for both their academic and professional lives. According to Paynor (2024) multimodal learning theory states that we understand and retain information better when use a variety of senses, including visual, auditory, and kinesthetic.

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Combining these modes allows learners to experience learning in a number of ways, resulting in a diversified learning style. Djamdjuri et al. (2021) define multimodal learning as an embodied learning environment including various sensory systems and learner action systems.

Based on numerous studies made by several researchers, Several studied had been made on multimodal teaching approach in mathematics such as meaning-making with mathematics textbook (Norberg, 2022); multimodal teaching and learning with the use of technology (Papageorgiou & Lamera, 2017); multimodal approaches to math and physical education within cooperative learning to enhance social attitudes (Bassachs et al., 2022); multimodal teaching for primary students in primary school classrooms (Lian, 2020). Therefore, with multimodal teaching approach benefits and its significance to teaching and learning process, the researcher proposes to conduct this study to revisit it positive outcome to Mathematics Grade 4 learners. This study aim to determine the effectiveness of multimodal teaching approach to enhance academic performance of Grade 4 Mathematics learners.

II. METHODOLOGY

In this section, research design, participants of the study, research instruments, data gathering, data analysis and research were briefly discussed below.

Research Design

This research used qualitative research design that employs quasi-experimental designs, such as non-equivalent control group designs, play a vital role in educational research, particularly when random assignment of participants to experimental conditions is not feasible or ethical. In these designs, participants are not randomly assigned to groups, leading to potential differences between the experimental and control groups before the intervention (Creswell, 2014). Non-equivalent control group designs involve comparing an experimental group that receives the intervention with a control group that does not, but the groups are not equivalent at the outset.

Participants of the Study

The study's participants were third-grade students at one of Laguna's schools. This study utilized two sections. During enrollment, the pupils were divided into parts based on their diversity. Those who were not partnered became blind participants. They were involved in the teaching and learning process; however, data collected from blind participants was not included in the study.

Research Instrument

The study assessed how improving Grade 4 mathematics performance may be achieved by a multimodal teaching method. Based on the Most Essential Learning Competencies of the Grade 4 Mathematics Curriculum, a K–12 lesson model was developed. A Table of Specifications was produced, along with a 30-item pretest and posttest. The test's validity was confirmed by master teachers, and reliability was assessed using Cronbach's alpha. A Cronbach's alpha coefficient of 0.85 was discovered during the investigation, which is suitable for scientific purposes.

Data Gathering

The study was approved by the school administrator and parents, and participants were informed about the study's purpose and value. Interviews were recorded, and participants signed a form. If face-to-face interviews were not possible, an online platform was used. The researcher explained the study's nature and purpose, and participants were informed of the alternative.

Data Analysis

The study aimed to evaluate the impact of a multimodal teaching approach on enhancing Grade 4 mathematics performance. A K-12 teaching methodology lesson model was created, based on the Most Essential Learning Competencies of the Grade 4 Mathematics Curriculum's assigned themes for the third quarter. A 30-item pretest and posttest were conducted on Grade 4 Mathematics topics from weeks one through eight. A Table of Specifications was created and validated, including the third quarter's competencies, meeting duration, topic, number of items to be tested for each competency, item distribution, and total number of items. Participants were given formative tests after comprehensive presentations. Cronbach's alpha, a statistic measuring internal consistency reliability, was used to measure the reliability of the pretest and posttest with a result of 4.89 with is highly acceptable.

Research Ethics

The rights and welfare of study participants are protected by the strictest ethical guidelines, which must be followed in all research activities. Privacy, confidentiality, and informed consent have to be upheld during the entire investigation. Data collection, storage, and analysis must be done responsibly, and any possible conflicts of interest must be declared. It is the responsibility of researchers to publish

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their findings honestly and to abstain from any wrongdoing, including plagiarism, fabrication, and falsification. The study cannot begin until ethical review bodies have given their approval.

III RESULTS AND DISCUSSIONS

After the data were gathered, analysed, and evaluated, the following research findings are presented:
The pretest mean score of comparison group and experimental group is low (Mean =12.42; SD=3.29), while formative test mean score of comparison group (Mean=13.69; SD=3.77) is lower than the experimental group (Mean=22.16; SD=3.78); however in terms of posttest mean score the comparison (Mean=12.68; SD=3.78) group is a little lower than the experimental group (Mean=17.88; SD=5.21).

The t-test revealed that there is slightly significant difference between the formative test scores of comparison group to experimental group [t(58)=4.62, Mean-Diff=8.47, p-value=.0001]. Numerous academics agree with the study's findings. The significance of formative assessment in the teaching and learning process has been highlighted by educational scholars in recent times as a way to improve student learning outcomes. Formative assessment is a critical component of the teaching process that greatly enhances student learning outcomes, according to Kültür and Kutlu (2021) and Bassachs et al. (2022). In their view, formative assessment is an essential component of the teaching process rather than just an evaluation tool. It gives teachers insightful knowledge about their students' comprehension and development, which allows them to implement targeted interventions to close learning gaps and improve students' overall learning experiences.

The t-test revealed that there is slightly significant between comparison and experimental group in terms of posttest [t(58)=3.683, Mean-Diff=5.20, p-value=.043]. Additionally, the t-test on the significant difference in the pretest and posttest score of the Comparison group revealed that it is statistically significant [t(58)=3.838, Mean-Diff=2.28, p-value=.001].

The t-test on the significant difference in the pretest and posttest score of the experimental group revealed that it is statistically significant [t(58)=10.739, Mean-Diff=5.46, p-value=.000] ,which means that there is a significant effect in the posttest score of the leaners after teacher employs multi-modal teaching approach in Grade 4 Mathematics.

Summarizing the students' performance from the pretest and posttest, both groups showed improvement; however, the experimental group's notable increase and the control group's noticeable improvement highlight how crucial it is to consider the numerous factors influencing these results. Finding out if the groups receiving strategic intervention materials and the ones not receiving them have significantly different performance gains is vital. Test results are more likely to rise after the teaching and learning process, even if it is true that kids may have lower test results before the procedure. This increase can range in intensity from a slight one to a very large one.

The data shows an evenly distributed score distribution between two groups, indicating a suitable starting point. Students are divided based on pretest results. Enhancing teaching and learning can be achieved through peer collaboration and considering instructional strategies and resources (Escalaw, 2022). Real experimental study is needed to determine the impact of specific educational resources, but this study uses quasi-experimental research, which positively impacts students' teaching and learning process. This approach aligns with current educational trends and psychological research.

Multiple academics (Bernarte & Digo, 2024; N. R. D. Paynor, 2024; Guo, 2023; Philippe et al., 2020; Han et al., 2023; Dahlström 2021; Dressman, 2019; Huang, 2020; Ross et al., 2020; Ouyang et al., 2022; Escalaw et al., 2023) corroborated this result by stating that a multimodal approach to teaching integrates various sensory channels, such as visual, auditory, and kinesthetic, to improve learning experiences (Paynor, 2024; Escalaw, 2021; (N. R. D. Paynor, 2024). Educators may accommodate a variety of learning styles and foster a deeper knowledge of their pupils by including them in many modes at once. Dynamic learning environments are produced by smoothly integrating interactive activities, visual aids, and technological resources. This method encourages involvement, increases student interest, and makes it easier for students to remember the material. In the end, the multimodal method gives students the power to create their own knowledge through interactive and experience learning, producing more significant and successful learning outcomes.

CONCLUSION

The study's findings reject the null hypothesis that there is no significant difference in formative mean score between the experimental and comparison groups. The experimental group performed significantly better on the formative test than the comparison group. The posttest mean score difference was also significant. The comparison group showed an improvement from pretest to posttest results, while the experimental group showed a significant improvement from pretest to posttest results. The study suggests that teachers should

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adopt a multi-modal teaching approach, education officials and administrators should offer materials and professional development training, and future researchers should explore additional characteristics or variables related to this approach.

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EVALUATION OF THE MECHANICAL PROPERTIES OF STYRENE BUTADIENE RUBBER(SBR)/BANANA FIBRE(BF) COMPOSITES

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ABSTRACT

Tensile strength, rip strength, abrasion loss, hardness, and thermal conductivity are the main characteristics of Styrene-Butadiene Rubber (SBR) composites that are examined in this work as a function of increasing banana fibre loading. Because banana fibres are reinforcing, adding them to the SBR matrix initially increases tensile and tear strength. However, there is an ideal concentration at which fibre aggregation and poor interfacial bonding cause these qualities to drop. Abrasion loss increases with higher loadings because of insufficient fibre dispersion, but it decreases with moderate fibre concentration, indicating enhanced wear resistance. Fibre addition improves the composites' hardness up to a certain point, beyond which adding too many fibres causes inconsistent results and lower hardness. It is discovered that as fibre counts increase, thermal conductivity decreases.

KEYWORDS—*SBR composites, tensile strength, thermal conducutivty.*

I. INTRODUCTION

I. INTRODUCTION

Polymers are widely used for different applications in the current world. Styrene-butadiene rubber (SBR) is a synthetic polymer composed of styrene and butadiene, widely used in various industries. Developed as a substitute for natural rubber, SBR is known for its excellent abrasion resistance and aging stability. It is extensively utilized in the production of automobile tires, conveyor belts, and footwear due to its durability and flexibility. The polymerization process of SBR can be tailored to achieve different mechanical properties, making it versatile for diverse applications. Despite its advantages, SBR's performance can be affected by extreme temperatures and oil exposure, necessitating careful selection for specific uses. Banana fibre composite materials are eco-friendly alternatives derived from the fibres of banana plants, known for their impressive strength and durability. These composites are utilized in various applications, including automotive parts, construction materials, and biodegradable packaging. Their lightweight nature and high tensile strength make them an attractive choice for industries aiming to reduce environmental impact while maintaining material performance. Additionally, banana fibre composites are biodegradable, contributing to sustainability and reducing waste.

A growing number of natural fibres are being used as a result of environmental concerns. Because of concerns about sustainability, many technical applications also choose materials based on natural fibres. One application for which this kind of composite material may be examined is the inside of automobiles.

II. MATERIALS AND METHODS

A. Raw Materials

The materials used are Styrene Butadiene Rubber(SBR), Carbon Black(CB) and Banana Fibre(BF). The concentration or loading of Banana Fibre is varied from 0phr,10phr,20phr,30phr,40phr,50phr. The rubber chemicals added are stearic acid, zinc oxide, sulphur etc.

Component	Amount (phr)
SBR (Styrene-Butadiene Rubber)	100
Banana Fibre	10,20,30,40,50
Zinc Oxide	3
Sulfur	1
CBS(N-Cyclohexyl-2-benzothiazolesulfenamide)	1
Carbon Black	10
Processing Oil	5

Table 1 Formulation of the SBR/BF Composite

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The naming of the composite based on the weight percentage of banana fibre are as follows.

Composite	Wt% of Banana Fibre (phr)
S1	10
S2	20
S3	30
S4	40
S5	50

Table 2 Naming of SBR/BF Composite

B. Preparation of Elastomer Composites.

The preparation of Styrene-Butadiene Rubber (SBR) and banana fibre composites using a two-roll mixing mill involves a systematic process. First, the SBR rubber is masticated on the mill to achieve a uniform consistency. Next, pre-treated banana fibres are gradually added to the masticated SBR rubber to ensure even dispersion. The milling process continues with repeated sheeting and folding to achieve a homogeneous composite blend. Finally, the mixed composite is sheeted out to the desired thickness, ready for further processing or molding into specific shapes.

A two roll mill was used to prepare the rubber composites. The standard conditions were maintained. A hydraulic press was used to get the polymer sheet pressed.

III. RESULTS AND DISCUSSION

The various tests were performed on the prepared elastomer composites and the results are discussed below.

A. Stress-Strain Characteristics

The variation of tensile strength with the variation of banana fibre is shown in the following graph. As the concentration of banana fibre in Styrene-Butadiene Rubber (SBR) composites is increased, a notable variation in tensile strength is observed. Initially, the tensile strength tends to improve due to the reinforcing effect of the banana fibres, enhancing the overall composite structure. However, beyond a certain fibre concentration, the tensile strength may begin to decrease. This decline is often attributed to fibre agglomeration, poor interfacial bonding, and inadequate stress transfer between the fibres and the rubber matrix. Therefore, optimizing the fibre concentration is crucial to achieving the best balance of mechanical properties in SBR-banana fibre composites.

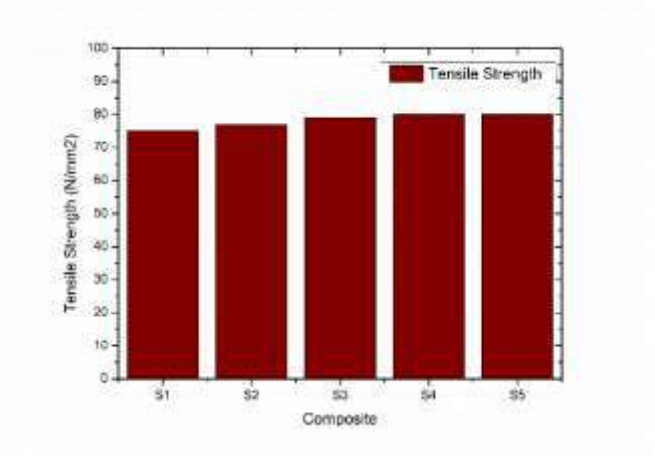


Figure 1 Variation of Tensile Strength

B. Tear Strength

The following graph displays the variation in tear strength.There is a clear pattern of fluctuation in the tear strength of Styrene-Butadiene Rubber (SBR) composites when the concentration of banana fibre is increased. Because of the fibres' ability to resist crack propagation, the tear strength often increases at lower fibre concentrations. An excellent balance between the rubber matrix and the reinforcing fibres may be reflected in the tear strength, which may reach an optimal point as the fibre concentration increases. However, due of fibre aggregation and inadequate bonding, additional increases in fibre content may result in weak spots within the composite and a loss in tear strength. Thus, in order to enhance the tear strength of SBR-banana fibre, it is imperative to have the ideal fibre concentration.

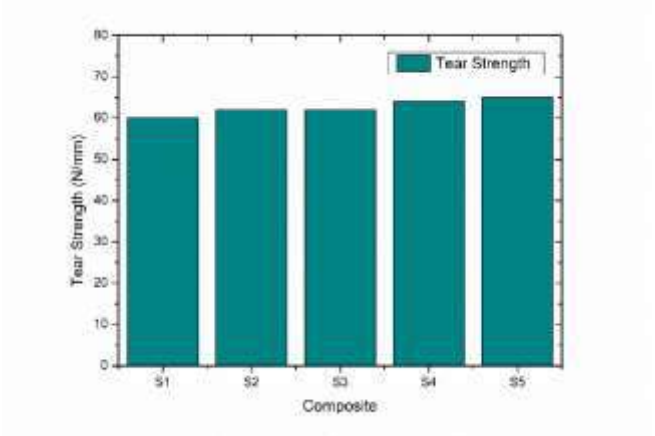


Fig 2 Variation of Tear Strength

C. Abrasion Loss

The abrasion loss variation for the various composites under study is displayed in the accompanying graph. The concentration of banana fibres has a major impact on the variance of abrasion loss in banana fibre composites made of Styrene-Butadiene Rubber (SBR). Because of their

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reinforcing function, banana fibres tend to reduce abrasion loss at lower concentrations, improving the wear resistance of the composite. The abrasion loss may minimize as the concentration of fibres rises, showing ideal fibre dispersion and rubber matrix interaction. But over this ideal threshold, too much fibre can result in more abrasion loss. Poor fibre dispersion, agglomeration, and weaker interfacial bonding, which impair the composite's resistance to wear, are frequently the cause of this rise.

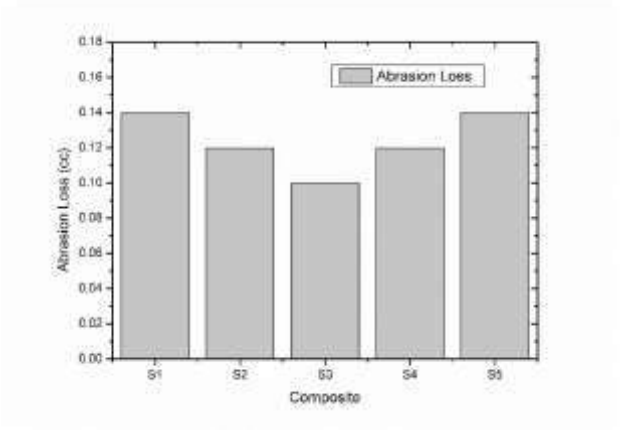


Figure 3 Variation of Abrasion Loss

D. Hardness

The variance in Hardness values of several composites is displayed in the accompanying graph. The concentration of banana fibres in Styrene-Butadiene Rubber (SBR) banana fibre composites affects how hard they are. Because of their stiffening action, banana fibres often increase the hardness of the composite at lower concentrations. The hardness may climb even more as the fibre content does, eventually reaching an ideal point where the fibres are evenly distributed and successfully strengthen the rubber matrix. However, more fibres may result in a decrease in hardness over this ideal percentage. Fibre aggregation and inadequate interfacial bonding, which result in irregularities within the composite structure, are frequently the cause of this drop.

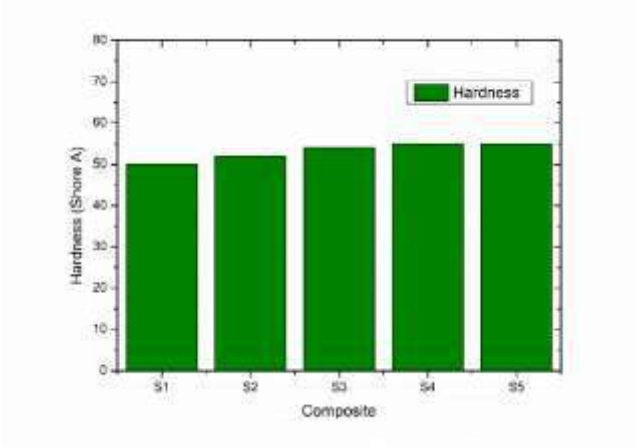


Figure 4 Variation of Hardness

E. Thermal Conductivity Studies

The following graph shows the variation of thermal conductivity. The thermal conductivity of Styrene-Butadiene Rubber (SBR) banana fibre composites is significantly affected by the concentration of banana fibres. Initially, the addition of banana fibres, which are natural insulators, tends to lower the thermal conductivity of the composite due to the inherent low thermal conductivity of the fibres. As the concentration of banana fibres increases, the overall thermal conductivity of the composite decreases further, reflecting the dominant insulating nature of the fibres. This decrease continues until an optimal fibre concentration is reached, where the insulating effect is maximized, and the composite exhibits the lowest thermal conductivity. However, beyond this optimal point, further increasing the fibre content can lead to agglomeration and poor dispersion of fibres, which may create thermal bridges and defects within the composite. These imperfections can slightly increase the thermal conductivity due to localized heat transfer pathways. Additionally, excessive fibre content may disrupt the homogeneity of the rubber matrix, further affecting thermal properties. Therefore, achieving a balance in fibre concentration is crucial to optimizing the thermal insulation properties of SBR-banana fibre composites. Properly managing the dispersion and interaction of fibres within the matrix ensures that the composite retains its desired low thermal conductivity. This balance is essential for applications requiring effective thermal insulation.

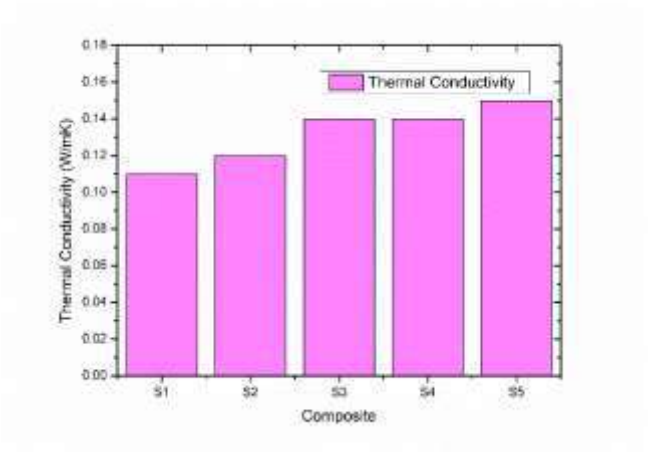


Figure 5 Thermal Conductivity

It is seen from the graph that the thermal conductivity values increases nominally for S3 composites and then it increases for S5 composites. The reason for the minute increase in value is due to the fact that the banana fibre being a natural fibre will not contribute to much increased thermal conductivity. The thermal conductivity tests were conducted on Lee Disc apparatus.

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Fig 6 Lee Disc Apparatus

F Tribological Properties

The tribological performance of styrene-butadiene rubber (SBR) composites reinforced with varying amounts of banana fibre is being discussed in this section. The analysis is conducted using a pin-on-disc apparatus, a widely used method for evaluating the friction and wear characteristics of materials.The equipment used is Pin-on-Disc Apparatus. The pin-on-disc test setup includes a stationary pin (specimen) in contact with a rotating disc under a controlled load.

Test Conditions

Load: 10 N
Sliding Speed: 1 m/s
Sliding Distance: 1000 m
Environment: Room temperature

One important factor in tribological research is the coefficient of friction(COF). In comparison to the composites with larger fibre contents, the SBR composite with the lowest banana fibre concentration (10 phr) had a higher friction coefficient. The friction coefficient trended downward as the amount of banana fibre rose. This phenomenon can be explained by the composite's decreased flexibility and greater stiffness, which results in less deformation under load.

It was discovered that as the amount of banana fibre in the composites increased, the wear rate decreased. The maximum wear rate was seen in the 10 phr banana fibre composite, suggesting that a substantial amount of material was removed during the sliding process. On the other hand, the banana fibre composite with a 30 PHr showed the least wear rate, indicating improved resilience to wear. The reinforcing effect of the banana fibres, which aid in load distribution and lower the rate of material removal, is probably what's responsible for this improvement in wear resistance.



Fig 7 Pin On Disc Apparatus

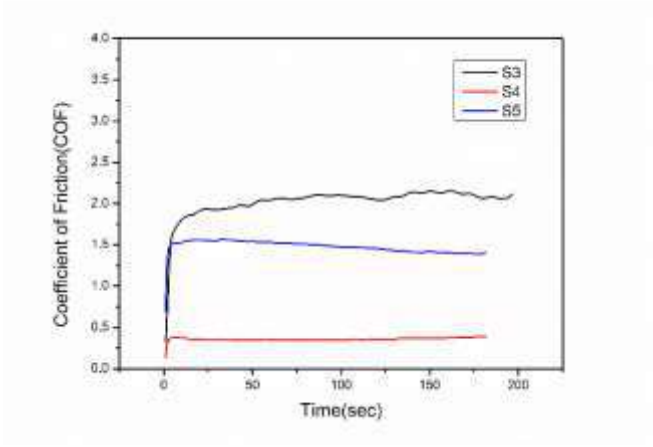


Fig 8 COF Vs Time

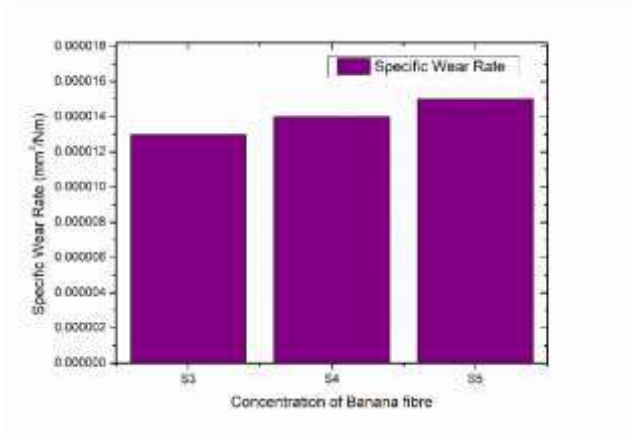


Fig 9 Variation of specific wear rate

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CONCLUSION

From the above test results, it is seen that the tensile strength increases but in a very small way when the banana fibre loading is increased in the composite. The variation of tear strength also is in a very slow manner as the fibre content goes up in the composite. The abrasion loss values in cc is also plotted for different composites and the main factor contributing the abrasion loss is the presence of carbon black. The hardness values does not show much change as increasing natural fibre content has got less effect on the composite.

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RICE EEL *(Monopterus albus)* FISHBALL FORTIFIED WITH CASSAVA - BASED SAGIP NUTRI- POWDER

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ABSTRACT

This study was conducted to determine the benefits of Rice Eel (Monopterus albus) Fishball Fortified with Cassava-Based SAGIP Nutri-Powder in promoting nutritious food to improve individual's health and well-being. One purpose of the study was to address and mitigate the malnutrition covered by the BIDANI among 14 barangays in the municipality of Echague, Isabela. The study involved four treatments: Treatment 1 (Commercial Fishball), Treatment 2 (50 grams CBSNP, 200 grams Rice eel flesh), Treatment 3 (100 grams CBSNP, 300 grams Rice eel flesh), and Treatment 4 (150 grams CBSNP, 500 grams Rice eel flesh, 250 grams All-purpose flour). A 9-point Hedonic Scale was used for sensory evaluation, in terms of appearance/color, aroma/odor, flavor/taste, and general acceptability. Sixty (60) respondents, categorized as students, tricycle drivers/farmers, and professionals aged 18-50 years old, served as panelist. Treatment 3 received the highest mean score across all treatments, with the quantitative description of "Like Very Much." Statistical analysis showed no significant differences among the treatments in terms of appearance/color, aroma/odor, flavor/taste, and general acceptability. However, Treatment 3 consistently received the highest ratings. The Return on Investment (ROI) analysis revealed that Treatment 2 was the most profitable for a business venture. Furthermore, the study underscores the importance of developing innovative, nutritious food products to improve public health. The development of such products can play a crucial role in improving the dietary habits and overall health of the population.

KEYWORDS: *BIDANI, CBSNP, Fishball,Fortified, Rice Eel*

INTRODUCTION

The problem and its background

In the latest trend of innovation, rice eels have been utilized and developed as food products, like rice eel longganisa, burger patties, and shanghai rolls. The increasing effort to transform this species into a valuable product got a hook by catching the attention of the researchers and food experts. Surprisingly, The rice eel *(Monopterus albus)* has been considered by the farmers as a pest, but last year it turned out to be a dollar-earner according to Jovita P., a son of the Bureau of Fisheries and aquatic Resources. Furthermore, the redirecting implication of progressive discoveries and growing technology introduce new forms of recognition into underrated sources. Along with the various and modern methods of improving current food sources.

Rosli & Sarbon (2015) state that, "swamp eels are known to have good nutrition, are tasty and used for medicinal purposes". The protein content of swamp eel flesh was 16.88%, moisture content was 83.87%, and fat content was 3.41% (Halim & Sarbon, 2017). Eel is a good source of protein, omega-3, and a wide range of vitamins and minerals. Eel provides a significant amount of vitamins A, D, and B12. It contains low levels of mercury. It can also provide a reasonable amount of omega-3 fatty acids, but there are better seafood sources (Michael Joseph, MSc, 2023).

In Eastern medicine, eel meat has the properties of orange, tonic for the spleen and stomach. The function of eel meat on the body helps to replenish damage, reduce leprosy, strengthen tendons and bones. Use eel meat for cases of tuberculosis, qi and blood, low blood pressure, postpartum hemorrhage, hemorrhagic dysentery syndrome, hemorrhoids, or physical weakness (VINMEC International Hospital)

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Cassava is an important source of food calories in the world, fulfilling a critical role as a food security crop (Haggblade, Andersson Djurfedlt, Banda Nyirenda, Bergman lodin, Brimer & Chiona, 2012). Stapleton (2012) stated that, "its roots are also one of the most important sources of commercial starch in tropical and subtropical countries. In fact, the crop is the second most important source of starch worldwide, after maize, and the most traded one". The global export of cassava starch and flour in 2014 amounted to 8.5 million tons (FAO, 2015). In South and South-East Asia, starch export has been one of the drivers of cassava expansion and 40% of the total cassava production is used for starch extraction (Fuglie, Oates & Xie, 2006). Applications of cassava starch (also known as tapioca) is found in the textile and pharmaceutical industry and within food manufacturing, for which it is well suited since it has a bland taste and produces a clear paste (Jobling, 2004; Fuglie, Oates & Xie, 2006; FAO, 2015).

The study aligned to the Sustainable Development goals which are: SDG #1 Poverty, SDG #2 Zero Hunger, SDG #3 Good Health and Wellbeing, SDG #8 Decent Work and Economic Growth, SDG #11 Sustainable Cities and Communities, and lastly SDG #12 Responsible Consumption and Production. Furtherly and sustainably focus on innovation and development.

Statement of the Problem

This study was conducted to determine the acceptability and potential benefits of Rice Eel *(Monopterus albus)* enriched with Cassava-Based Sagip Nutri-Powder Fortified with CPH, Malunggay, and Turmeric Powder through fish ball and to promote a daily healthy lifestyle.

Specifically, it aimed to answer the following questions:

1. What is the level of acceptability of the Rice Eel Fishball fortified with Cassava-Based SAGIP Nutri-Powder in terms of appearance/color, aroma/odor, taste/flavor, and general acceptability?
2. What is the difference in acceptability levels among the four treatments of Rice Eel Fishball based on the evaluated sensory attributes?
3. What is the most preferred among the four treatments?
4. What is the Return on Investment (ROI) computed for the different treatment ?

METHODOLOGY

Materials and Equipment

The study used different kitchen utensils in making Rice Eel Fishball such as chopping board, Frying pan, knife, mixing bowl, whisk, disposable gloves, colander, blender, weighing scale, measuring tools.

Experimental Design and Treatments

This research was experimental type. This study was conducted with four (4) treatments.

The data and other information were presented, treated and analyzed using the experimental design in comparing the groups under the observation of this research.

In this research, the ratios of ingredients for Rice Eel Fish Ball remained consistent, except for the main components, namely rice eel and the binding agents, which include all-purpose flour, and egg white. Different ratios of Cassava-Based SAGIP Nutri- Powder were used as a fortification in making Rice Eel Fishball.

The treatments are the following:

Treatment 1

200 grams Galunggong fish, 150 grams All purpose flour, 15 grams cornstarch, 5 grams of garlic and onion powder, 12 grams ground pepper, 66 grams egg white, 500 grams oil and 24 grams salt.

Treatment 2

200 grams Rice eel flesh, 50 grams Cassava- Based SAGIP Nutri- Powder, 150 grams APF, 15 grams cornstarch, 15 grams garlic and onion powder, 12 grams ground pepper, 66 grams, 500 grams oil, 24 grams salt.

Treatment 3

300 grams rice eel flesh, 100 grams Cassava- Based SAGIP Nutri- Powder, 200 grams APF, 15 grams cornstarch, 15 grams garlic and onion powder, 12 grams ground pepper, 66 grams egg white, 500 grams oil, 24 grams salt.

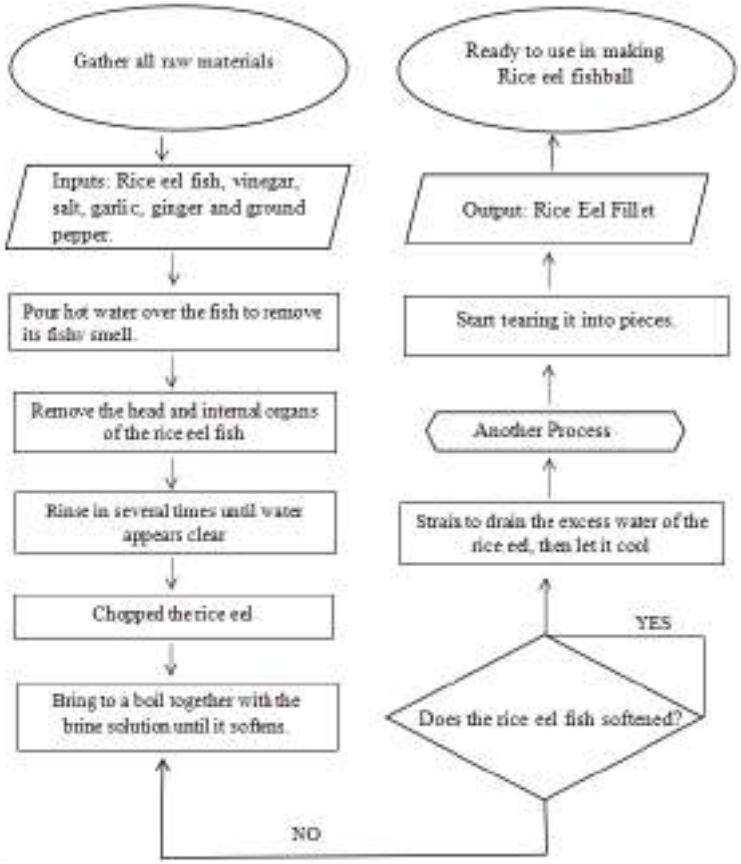
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Treatment 4

500 grams rice eel flesh, 150 grams Cassava- Based SAGIP Nutri- Powder, 250 grams APF, 15 grams cornstarch, 15 grams garlic and onion powder, 12 grams ground pepper, 100 grams egg white, 500 grams oil, 24 grams salt

Processing Procedure

1. **Preparation of Rice Eel Fillet**



Pour hot water over the fish to remove the fishy smell. Remove the head and internal organs of the rice eel fish. Chop the rice eel into small pieces then bring to a boil together with the brine solution until it softens. Strain to drain the excess water of the rice eel, then let it cool. Remove the fishbones, then start tearing it into pieces.

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2. Preparation in Making Rice Eel Fishball

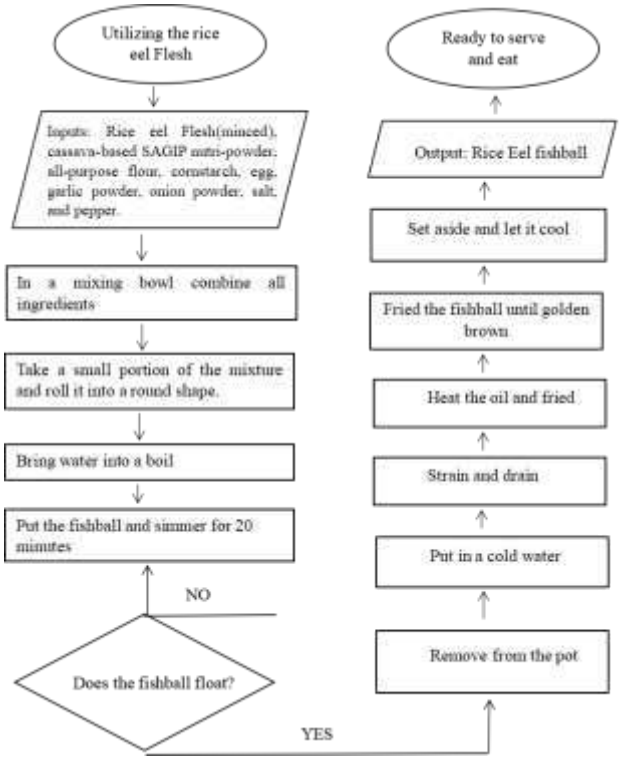


Figure 2. Process on making Rice Eel Fishball

The rice eel fishball were prepared using the proportion given in the treatments above.
In a mixing bowl, mix together the all-purpose flour, Cassava- Based SAGIP Nutri- Powder, cornstarch, salt, onion powder, one by one into a separate small bowl, beat them until frothy, then add them to the combined dry ingredients. Stir the mixture thoroughly until it is uniform. Incorporate this combined mixture into the rice eel paste, then mix it thoroughly. Make small portions of the mixture and shape them into round shapes. Repeat this process until all of the mixture is used.

Fill a large bowl with water and place it in a pot. Place the pot on the stove and warm the water until it reaches a lukewarm temperature. Submerge the fish balls in the lukewarm water in the pot and simmer them for 20 minutes. Once done, take the fish balls out of the pot and place them in a strainer to cool down. In a separate frying pan, add oil and heat it up before cooking the boiled fish balls. Once they turn a golden brown color, remove them from the oil and place them in a strainer to drain excess oil.

The same procedure was done to the other treatments using separate cooking utensils to eliminate contaminants which will affect the organoleptic characteristics of the product.

Sensory Evaluation

A sensory evaluation was conducted at CEd Cafeteria, Isabela State University Echague Campus to assess the acceptability of Rice Eel *(Monopterus albus)* Fishball fortified with Cassava-based SAGIP Nutri-Powder using a 9-Point Hedonic Scale for appearance, aroma, taste, and overall acceptability.

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The range of scale is interpreted as follows:

Scale	Range	Descriptive Rating
9	8.50- 9.00	Like Extremely
8	7.50- 8.49	Like Very Much
7	6.50- 7.49	Like Moderately
6	5.50- 6.49	Like Slightly
5	4.50-5.49	Neither like or dislike
4	3.50-4.49	Dislike Slightly
3	2.50-3.49	Dislike Moderately
2	1.50-2.49	Dislike Very Much
1	1.00-1.49	Dislike Extremely

A sensory panel was composed of sixty (60) individuals classified into 3 groups: the professionals, students and the tricycle drivers/farmers, encompassing diverse culture in terms of ages among regular street food consumers. This seeks to capture a broad range of preferences and viewpoints regarding street food products. The qualifications of the panelist in terms of age are 18- 50 years old.

Cost and Return Of Investment

Cost analysis was performed to determine the economic feasibility of the product if it will be sold in the market.

This was done by listing down all the costs incurred in producing the different proportions of Rice Eel Fishball Fortified with Cassava- Based SAGIP Nutri- Powder and computing the unit cost and the return on investment (ROI) per treatment.

RESULTS AND DISCUSSION

Summary of Findings

STUDY 1. Determine the level of acceptability of Rice Eel (*Monopterus albus)* Fishball Fortified with Cassava-Based SAGIP Nutri-Powder

In terms of Appearance/color

As shown in Table 1 , the Rice Eel (*Monopterus albus*) Fishball Fortified with Cassava-Based SAGIP Nutri-Powder was well-received across all treatments in terms of appearance/color, aroma/odor, flavor/taste, and general acceptability. Treatment 3 consistently stood out, scoring the highest in appearance (8.38), aroma (8.42), flavor (8.45), and general acceptability (8.35), indicating it was the most preferred among all treatments. Treatment 1 also performed well, receiving scores of 7.75 for appearance, 7.62 for aroma, 7.68 for flavor, and 7.67 for general acceptability, showing it was highly favored by the panelists. Treatment 2, with scores of 7.58 for appearance, 7.58 for aroma, 7.52 for flavor, and 7.68 for general acceptability, was similarly well-received but slightly less than T1. Treatment 4 received the lowest scores in each category 7.30 for appearance, 7.62 for aroma, 7.60 for flavor, and 7.58 for general acceptability, still indicating a strong positive reception. Overall, the high scores across all treatments reflect a strong positive reception, with Treatment 3 emerging as the most preferred in all aspects.

Table 1. Level of acceptability of Rice Eel (*Monopterus albus)* Fishball Fortified with Cassava-Based SAGIP Nutri-Powder

	Appearance/Color	Aroma/Odor	Taste /Flavor	General Acceptability	Mean	Description
Treatment $_1$	7.75 b	7.62	7.68	7.67	7.68	LVM
Treatment $_2$	7.58 bc	7.58	7.52	7.68	7.59	LVM
Treatment $_3$	8.38 a	8.42	8.45	8.35	8.4	LVM
Treatment $_4$	7.30 c	7.62	7.60	7.58	7.52	LVM

Note: LVM- Like Very Much

STUDY 2. Difference in acceptability level of Rice Eel *(Monopterus albus)* Fishball Fortified with Cassava-based SAGIP Nutri-powder.

In terms of Appearance/Color

The analysis of variance for Rice Eel *(Monopterus albus)* Fishballs fortified with Cassava-Based SAGIP Nutri-Powder shows significant differences among treatments. Treatment 3 was most favored with a mean score of 8.38 or Like Very Much, followed by Treatments 1 and 2 with scores of 7.75 and 7.58, respectively. Treatment 4 scored the lowest at 7.30 or Like Moderately. Variability was significant at the 1% level, with a moderate coefficient of variation at 11.77%. Overall, the formulations were well-received, with Treatment 3 being the most appealing.

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Table 2. Appearance/Color of Rice Eel (*Monopterus albus)* Fishball Fortified with Cassava-Based SAGIP Nutri-Powder

TREATMENTS	Mean	Description
Treatment 1	7.75 b	Like Very Much
Treatment 2	7.58 bc	Like Very Much
Treatment 3	8.38 a	Like Very Much
Treatment 4	7.30 c	Like Moderately
ANOVA Result	**	
C.V. (%)	11.77	
LSD	0.43	

Note: Means with the same letter/s are not significantly different from each other using LSD test.
*** - significant at 1% level*

In terms of Aroma/Odor

The analysis of variance for the aroma/odor of Rice Eel *(Monopterus albus)* Fishballs fortified with Cassava-Based SAGIP Nutri-Powder showed significant differences among treatments. Treatment 3 was the most favored with a mean score of 8.42 or Like Very Much. Treatments 1, 2, and 4 also received positive ratings, though slightly lower than Treatment 3. The differences were significant at the 1% level, with a moderate coefficient of variation at 11.54%, indicating consistent responses. Overall, the aroma/odor was well-received, with Treatment 3 being the most appealing.

Table 3. Aroma/Odor of Rice Eel (*Monopterus albus)* Fishball Fortified with Cassava-based SAGIP Nutri-powder.

TREATMENTS	Mean	Description
Treatment 1	7.62 b	Like Very Much
Treatment 2	7.58 b	Like Very Much
Treatment 3	8.42 a	Like Very Much
Treatment 4	7.62 b	Like Very Much
ANOVA Result	**	
C.V. (%)	11.54	
LSD	0.43	

Note: Means with the same letter/s are not significantly different from each other using LSD test.
*** - significant at 1% level*

In terms of Taste/Flavor

The analysis of variance for the taste/flavor of Rice Eel (*Monopterus albus*) Fishballs fortified with Cassava-Based SAGIP Nutri-Powder showed significant differences among treatments. Treatment 3 was the most favored, with the highest mean score of 8.45 or Like Very Much. Treatments 1, 2, and 4 also received positive ratings, with mean values between 7.52 and 7.68. The differences were significant at the 1% level, with a moderate coefficient of variation at 12.05%, indicating consistent responses. The LSD test confirmed that the four treatments were not significantly different in taste/flavor acceptability. Overall, the taste/flavor was well-received, with Treatment 3 being the most preferred.

Table 4. Taste/flavor of Rice Eel (*Monopterus albus)* Fishball Fortified with Cassava-based SAGIP Nutri-powder

TREATMENTS	Mean	Description
Treatment 1	7.68 b	Like Very Much
Treatment 2	7.52 b	Like Very Much
Treatment 3	8.45 a	Like Very Much
Treatment 4	7.60 b	Like Very Much
ANOVA Result	**	
C.V. (%)	12.05	
LSD	0.45	

Note: Means with the same letter/s are not significantly different from each other using LSD test.
*** - significant at 1% level*

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In terms of General Acceptability

The analysis of variance for the general acceptability of Rice Eel (Monopterus albus) Fishballs fortified with Cassava-Based SAGIP Nutri-Powder revealed significant differences among treatments. Treatment 3 was the most preferred, with the highest mean score of 8.35 or Like Very Much. Treatments 1, 2, and 4 also received positive ratings, with mean values between 7.58 and 7.68. The differences were significant at the 1% level, with a moderate coefficient of variation at 12.91%, indicating consistent responses. The LSD test confirmed no significant differences among treatments with the same letter. Overall, Treatment 3 was the most favored for general acceptability.

Table 5. General Acceptability of Rice Eel (*Monopterus albus)* Fishball Fortified with Cassava-Based SAGIP Nutri-Powder

TREATMENTS	Mean	Description
Treatment 1	7.67 b	Like Very Much
Treatment 2	7.68 b	Like Very Much
Treatment 3	8.35 a	Like Very Much
Treatment 4	7.58 b	Like Very Much
ANOVA Result	**	
C.V. (%)	12.91	
LSD	0.48	

Note: Means with the same letter/s are not significantly different from each other using LSD test.
*** - significant at 1% level*

STUDY 3. Most Preferred treatment among the four treatment

Among the four treatments of Rice Eel *(Monopterus albus)* Fishballs fortified with Cassava-Based SAGIP Nutri-Powder, Treatment 3 was the most preferred by panelists. It achieved the highest scores in appearance of 8.38, aroma of 8.42, taste of 8.45, and general acceptability of 8.35, resulting in a top grand mean of 8.4. Treatment 4, although liked very much, had the lowest grand mean of 7.52. Overall, Treatment 3 consistently demonstrated superior sensory attributes and was the most preferred.

Table 6. Most Preferred Treatment among the four treatment of Rice Eel (*Monopterus albus)* Fishball Fortified with Cassava-Based SAGIP Nutri-Powder

TREATMENTS	Treatment 1	Treatment 2	Treatment 3	Treatment 4
Appearance/ color	7.75	7.58	8.38	7.30
Aroma/ odor	7.62	7.58	8.42	7.62
Taste/ flavor	7.68	7.52	8.45	7.60
General Acceptability	7.67	7.68	8.35	7.58
Grand Mean	7.68	7.59	8.4	7.52

STUDY 4. Summary and Computation of Return on Investment of Rice eel (*Monopterus albus)* fishball fortified with Cassava based SAGIP Nutri- Powder

Table 7 summarizes the Cost and Return analysis for making Rice Eel *(Monopterus albus)* Fishballs Fortified with Cassava-Based SAGIP Nutri-Powder across four treatments. Treatments 1, 2, 3, and 4 show varying Return on Investment (ROI) percentages: Treatment 1 (39.80%), Treatment 2 (43.89%), Treatment 3 (42.06%), and Treatment 4 (40.22%). Treatment 2 emerges as the most profitable. Overall, all treatments show positive returns, indicating a viable venture.

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Table 7. Summary and Computation of Return on Investment of Rice Eel (*Monopterus albus)* Fishball Fortified with Cassava-Based SAGIP Nutri-Powder.

TREATMENTS	Treatments			
	Treatment 1	Treatment 2	Treatment 3	Treatment 4
Total Production Cost (Php)	157	262	315	368
Unit Cost = Total Cost / No. Of Packs	39.25	65.5	63	61.33
Selling Price = (Unit Cost x 50% +No. Of Packs)	43.625	36.75	36.5	36.66
Total Sale = Selling Price x No. Of Packs	94.5	147	182.5	219.96
Income = Total Sale- Total Production Cost	62.5	115	132.5	148.04
ROI = Income x100 / Total Production Cost	39.80%	43.89%	42.06 %	40.22%

CONCLUSIONS

Based on the findings of the study, the following conclusions are derived:
First, The Rice Eel *(Monopterus Albus)* Fishball Fortified with Cassava-based SAGIP Nutri-powder regarding from the four different treatments in terms of level of acceptability in different sensory attributes among the four treatments, treatment 3 has gained the highest average mean. Therefore Treatment 3 was the most preferred in four different evaluated sensory attributes. Second, the Rice Eel *(Monopterus Albus)* Fishball fortified with Cassava-based SAGIP Nutri-powder regarding their general acceptability made from the different four treatments have no significant difference. Third, treatment 3 is the most preferred treatment in making Rice Eel *(Monopterus Albus)* Fishball Fortified with Cassava-based SAGIP Nutri-powder gaining a score of 8.4%. Finally, treatment 2 got the highest return on investment of 43.89%, while treatment 3 and treatment 4, has ROI of 42.06% and 40.22%, and lastly treatment 1 has an ROI of 39.80% respectively.

RECOMMENDATIONS

Based on the study results, here are concise recommendations:

1. Study and refine Treatment 3 composition for targeted market segmentation. Educate consumers on its nutritional benefits and continuously enhance the product through feedback and research.
2. Highlight nutritional advantages of rice eel flesh, utilizing all edible parts. Implement quality controls for consistent nutritional content.
3. Allocate resources strategically based on ROI variations to enhance profitability. Emphasize these benefits in marketing and promotions to leverage unique selling points.
4. Perform a thorough nutritional analysis of the rice eel fish ball product to guide further research and development.
5. Investigate product shelf life under various conditions to ensure stability and longevity.
6. Conduct additional research for conclusive and reliable results, exploring various aspects of product development and consumer preferences.

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The Researchers.

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AN ISLAMIC VIEW ON STRESS MANAGEMENT: A COMPREHENSIVE LITERATURE REVIEW

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ABSTRACT

The current trend in stress management is a shift from a Western perspective to a more holistic approach that integrates stress management with religious practices. This is because several previous studies have found that religion contributes to a peaceful individual life and helps prevent mental problems. The goal of this study is to find previously completed stress management techniques from an Islamic perspective to improve students' wellbeing. The methodology employed in this study is a systematic literature review. A total of 500 publications were discovered pertaining to the stage, according to the research findings. At first, there were numerous pertinent publications that aligned with the criteria established by the researcher. The study suggests that the Islamic approach to stress management includes practices such as reading the Quran, engaging in dhikr (remembrance of Allah), and praying, which can make success possible.

KEYWORDS: *Stress management perspective, on student welfare, from an Islamic standpoin.*

1. INTRODUCTION

The prevailing tendency in stress management is to shift from a Western approach to stress management towards a religious perspective or the incorporation of religious elements. Multiple prior studies have established that religion plays a significant role in promoting people's peace of mind and serves as a preventive measure against mental diseases. (Aazami and Marzabadi 2017). The study completed by Haneef Khan et al. in (2012) I discovered that the religious convictions of a Muslim have a beneficial impact on their problem-solving abilities. There is an inverse relationship between a Muslim's Islamic identity and their stress levels, meaning that a stronger Islamic identity is associated with lower stress levels. Additionally, problem-solving or coping skills that are rooted in Islamic values are positively associated with an individual's psychological well-being.The impact of religion on stress reduction and pleasure enhancement is seen in the domains of faith and the implementation of religious doctrines. The active engagement of a Muslim in adhering to religious principles in daily life exerts a more pronounced impact on alleviating stress and enhancing happiness compared to mere faith. (Abu-Raiya and Ayten 2019). Sadeghi et al. (2019) Furthermore, it was discovered that the proper execution of religious ceremonies has a substantial impact on enhancing personal mental well-being. This implies that adhering to Islam in a perfect manner in one's everyday routine can lead to inner tranquilly, mental clarity, and overall contentment with life. (Sudan 2019) The presence of religion in reducing stress and enhancing happiness (well-being) is seen in both the acceptance and implementation of religious doctrines. The active engagement of a Muslim in the application of profound Islamic principles in their daily lives exerts a more pronounced impact on reducing stress levels and enhancing overall happiness, surpassing the influence of mere faith.(Abu-Raiya and Ayten 2019) Sadeghi et al. (2019) Additionally, it has been discovered that the incorporation of religious rituals has a substantial impact on enhancing individual mental well-being. This implies that adhering to Islam in a proper and consistent manner in one's everyday life can result in a serene state of mind, rational thinking, and overall satisfaction with life. (Sudan 2019)

Hence, to effectively address anxiety, stress, and depression while promoting psychological well-being and individual happiness, it is imperative to incorporate religious teachings into the intervention. Islamic teachings encompass a holistic approach to treatment and healing, including spiritual, psychological, and material dimensions. (Sudan 2019). Islam offers various methods for healing and promoting health to its followers. Firstly, Muslims firmly believe that Allah SWT is the sole provider of human well-being. This conviction is founded upon passages found in the Qur'an, particularly in the surah Ash-Shu'ara' Verse 25- 80 states قَالَ لِمَنۡ حَوۡلَهُۥٓ أَلَا تَسۡتَمِعُونَ"and when I am ill, He is the one who restores my health." This conviction will instill in humans the virtue of patience when confronting the anguish and challenges they encounter.Furthermore, engage in the act of reading the Koran. Engaging in the act of reading the Quran at times of sadness, anxiety, and discomfort can provide solace and tranquilly to one's mental state. As stated in the Qur'an, specifically in Surah Ar-Ra'd verse 13-28,

وَيُسَبِّحُ ٱلرَّعۡدُ بِحَمۡدِهِۦ وَٱلۡمَلَٰٓئِكَةُ مِنۡ خِيفَتِهِۦ وَيُرۡسِلُ ٱلصَّوَٰعِقَ فَيُصِيبُ بِهَا مَن يَشَآءُ وَهُمۡ يُجَٰدِلُونَ فِي ٱللَّهِ وَهُوَ شَدِيدُ ٱلۡمِحَالِ

Allahswa affirms, which means"Specifically, this refers to individuals who have faith and experience tranquilly in their hearts through the act of remembering Allah." The heart finds tranquilly alone via the contemplation of Allah. ٱلَّذِينَ ءَامَنُواْ وَتَطۡمَئِنُّ قُلُوبُهُم بِذِكۡرِ ٱللَّهِۗ أَلَا بِذِكۡرِ ٱللَّهِ تَطۡمَئِنُّ ٱلۡقُلُوبُThe third step involves ingesting nourishment and medications, including both

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natural and synthetic substances, in accordance with one's specific requirements. This represents a manifestation of human exertion, as the Prophet Muhammad (peace be upon him) witnessed. He stated that Allah is the creator of both disease and its remedy and that every disease has its own cure. Therefore, it is advisable to pursue medical intervention. (HR. Abu Dawud) To obtain comprehensive information on stress management methods explored by previous researchers, the authors conducted a systematic literature review by utilising Google's database. This approach was chosen as it allowed them to identify stress management themes from an Islamic perspective.

THE APPROACH

The author conducted a thorough analysis of the available literature, utilising a methodical methodology. The author does data extraction utilising the Google.com platform and other relevant literature. The employed keywords encompass Islamic perspective stress management, Islamic stress management, prayer intervention, memory intervention, and fasting intervention. The article search was performed according to specific inclusion criteria.The investigation was done from 2010 to 2024. The performed investigations encompassed both experimental and non-experimental research on stress management, academic stress, and student welfare.The study was conducted on adolescents in middle school (junior high and high school) as well as young adults in college. The criteria for exclusion are as follows: The study was done among secondary school students (both junior high and senior high school) as well as college students. (Fig. 1)

Identification	**Screening**	**assessment**
Article	eligibility	eligibility
The number of articles found from the Google database is 500 articles	Duplicate selection and title found 500 articles	Abstract selection, found 50 relevant articles
Assessment of the content of the arti- cle as a whole to see the feasibility of the articles in this study and found 20 eligible articles.	The number of articles that qualify or deserve to be analyzed is 20 articles	***No duplication found***
There were 300 articles that were excluded because they did not meet the criteria	The number of additional articles from other sources is 0 articles	The selection of articles as a whole issued (excluded) as many as 5 articles. The reason the article was excluded is that the subject is not a student or student

Figure 1. Islamic Stress Management Systematic Literature Study Procedure Chart.

The author conducted a data-based search for articles on stress management from an Islamic perspective, yielding the following results: Google.com discovered 500 articles that were pertinent to the keywords specified by the author.During the subsequent phase, the researcher performed abstract screening and identified a total of 450 articles that failed to match the requirements, while just 50 articles were deemed relevant based on abstract selection.Subsequently, the papers were evaluated based on their substance, and the writers identified a mere 50 articles deemed suitable for additional analysis. In addition, the researchers carried out a study on the 50 publications.

The study findings revealed that several studies were undertaken to assess the efficacy of stress intervention or management techniques, among other factors. The study conducted by Nugra-Heni et al. in 2018 To conduct a study on the efficacy of reading the Koran in reducing academic stress among students in the eleventh grade of high school, the objective is to determine whether reading the Al-Quran and listening to murottal Al-Quran may effectively reduce academic stress among students. The study conducted by Munif et al. in 2019 To conduct research on the impact of Islamic spiritual awareness on stress levels among nursing students.Islamic spiritual mindfulness, also known as Islamic spiritual consciousness, involves five daily sessions lasting 20 minutes each. These sessions aim to awaken motivation for spiritual growth and enhance worship, encourage self-reflection to analyse personal issues, cultivate a heightened sense of willpower and self-awareness, foster emotional responsiveness, engage in dhikr (remembrance of God), practice acceptance, and promote relaxation.

In addition, Afridah et al. (2018) conducted a study on the efficacy of training Wonder Prayer Islamic in enhancing the well-being and emotions of high school students. An Islamic prayer session for training miracles is being done. Over the course of two days, the content covered many aspects of prayer. On the first day, the focus was on the meaning of prayer, its benefits, the restrictions and rules surrounding prayer, and the concept of miraculous prayer. The second day delved into the practical application of prayer, the third component of prayer, and further discussions on the subject. More precisely, it refers to the act of praying in order to attain contentment and tranquilly, irrespective of one's hardships. This encompasses both the concept of prayer itself and its historical

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significance. Rohmania and Annatagia (2020) will conduct a study on enhancing subjective well-being in teenagers from divorced families using memory training. The training session focuses on the study of challenging life situations, purification of the soul, theoretical and practical aspects of memory, prayer, contemplation of the Qur'an, and self-assessment through the assigned home practice of dhikr.

In their study, Martin et al. (2018) examined the impact of relaxation recollection on the subjective well-being of adolescent pupils. The process of training relaxation involves engaging in the recitation of activities dedicated to Allah SWT. In a study conducted by Irman et al. (2019), the impact of dhikr relaxation in counselling was examined as a means to decrease internet addiction. The stages of relaxation and remembrance in a counselling group are as follows: Firstly, the therapist establishes a psychological rapport with the students, engages in discussions about the anxiety experienced due to internet addiction, and encourages them to express their hopes regarding the challenges they are facing. The process consists of three stages:

- Activity initiation, which involves relaxation and remembering;
- Activity continuation, which includes reflection, self-analysis, messages, and conclusions; and
- Activity termination and cessation. Ismail (2016) conducted a study on Islamic guidance and counselling, specifically focusing on the application of therapy through movement salat as a means of relaxation to alleviate anxiety. The participant engaged in the study of movement and prayer under the leadership of an instructor. The combination of therapy, physical activity, and religious devotion has the potential to reduce anxiety.

Furthermore, there are Muslim researchers. In order to conduct a study on various stress management approaches from an Islamic standpoint, it is important to note that there is a lack of empirical evidence about the efficacy of the methods being offered. The research methodologies employed include empirical studies, extensive literature reviews, and qualitative analysis. Several studies, like Lamoshi's (2015) research, have examined the use of religion as a resilience tool for managing stress in teenagers, specifically through an Islamic perspective. Approach: His research employs qualitative methods. Lamoshi reveals that there are several strategies for stress management, with the initial one being to adopt a positive mindset. Positive thoughts have the ability to elevate one's attitude and behaviour in a positive manner. Islam instructs its followers to consistently exhibit patience and gratitude in all situations, as conveyed by the words of Rasulullah Saw, which signify the excellence of a believer whose every endeavour is virtuous, with no exception. If he experiences pleasure, he expresses gratitude; conversely, if he encounters challenges, he demonstrates patience. "That exceeds his capabilities" (Hadith of a Muslim). Implementing this approach in daily life can serve as a tool for Muslim students to cultivate a mindset that consistently embraces positive and optimistic thinking, regardless of the circumstances they encounter. Bekhets (2018) demonstrates that adopting a positive mindset and rejecting religious beliefs might have a beneficial impact on an individual's overall well-being, encompassing both physical and psychological components.

Furthermore, the individual is characterised by a positive and hopeful outlook. In Surah Al-Baqarah (2) verse 83, Allah SWT commanded the Children of Israel not to worship anyone other than Him and to treat their parents, relatives, children, orphans, and the needy with kindness. Engage in polite and articulate communication with others, engage in prayer, and fulfil the obligation of paying zakat. "However, you subsequently avert your attention (refuse), with the exception of a small portion of yourself, and you persist as a dissenter." Embracing a compassionate and altruistic mindset can foster a positive outlook in self-learners, as it brings about a sense of joy when providing assistance to others. Optimistic attitudes are crucial to the daily existence of a densely populated Muslim community that is deeply rooted in Islamic principles. Optimistic attitude: This facilitates individuals in adjusting to situations or mitigating the challenges they encounter, hence potentially enhancing their psychological well-being (Souri and Hasanirad, 2011; Yovita and Asih, 2019).

Furthermore, it is crucial to maintain a sense of optimism and perseverance. In a hadith, Rasulullah saw, which translates to "From Abu Hurairah Radhiyallahu anhu, he said, Messenger of Allah Shallallahu ‘alaihi wow greetings said, a robust believer is more virtuous and more beloved by God Azza wow Jalla than feeble believers; and both are deserving of kindness." Adopt a serious attitude, acquire what is beneficial for you, and seek assistance from Allah in all your endeavours as well. Do not experience occasional weakness. When faced with a calamity, instead of stating, "If I had done this, then that wouldn't have happened," it is better to acknowledge that it is Allah's will and accept that He has the power to accomplish anything He desires. This is because entertaining thoughts of "what if" might lead to negative actions influenced by Satan. The Hadith of Rasulullah refers to the sayings, actions, and approvals of Prophet Muhammad. Provide students with encouragement to persevere through challenges, cultivate a sense of optimism in their pursuit of knowledge and aspirations, practice rational thinking, overcome negative ideas, and develop smart behaviour. These efforts will contribute to students' psychological well-being, fostering feelings of tranquilly, happiness, and overall contentment.

Furthermore, one should "savour existence." To derive pleasure from life entails approaching it with a tranquil state of mind, maintaining a positive mindset, and cultivating happy emotions. In order to engage in positive interactions with others, it is important to provide assistance and refrain from displaying condescension. The Prophet Muhammad (peace be upon him). "The act of smiling

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in front of your brother is so valuable that it can be considered a charitable act" (HR. Tirmidhi). Furthermore, "refrain from experiencing sorrow." Renowned author Dr. Ayaid Al-Qarni has authored a book, already translated into other languages, titled "No Sad." This book offers guidance from the Al-Quran and the Hadith of the Prophet, aimed at helping individuals overcome sadness, anxiety, and frustration. Al-Qarni advises leading a life of gratitude, free from dwelling on the past and excessive preoccupation with time, as both can give birth to tension and dissatisfaction. It is important to be focused on the present moment. Engaging in meaningful pursuits, embracing life's offerings, consistently pursuing knowledge for lasting contentment, and refraining from negative thinking will alleviate anxiety. The study conducted by Andriyani et al. in 2017 identified worry as a mediator of correlation. Anxiety significantly affects the overall well-being of exhausted pupils and kids in need of welfare in educational settings.

In their study, Aazami and Marzabadi (2017) chose to do research or engage in academic investigations. Sources on stress management model patterns based on the Quran and hadith. The Quran and Sunnah provide guidance on four distinct strategies for controlling stress: cognitive, behavioural, emotional, and ltimate. The cognitive aspect encompasses one's belief and trust in Allah SWT and their understanding and application of wisdom, guidance, and insight. It also includes faith in qada and qadar (divine decree), the certainty that God is the provider of sustenance, belief in God's grace, trust in the omnipotence of God, belief in the day of resurrection, faith in the afterlife, acknowledging Allah Most High's love, demonstrating dedication and perseverance in worship, and being mindful of mortality.

Behavioural methods encompass various actions such as engaging in prayer, entering into matrimony or starting a family, fulfilling the obligation of zakat, maintaining a consistent state of patience, engaging in restful sleep, performing the hajj pilgrimage, observing fasting, actively participating in social interactions, expressing gratitude and contentment with life, adhering to the teachings and practices of the apostle, extending assistance to others, resolving issues in a constructive manner, performing virtuous deeds in the name of Allah, and seeking repentance. Strategies for managing stress through emotional means involve maintaining unwavering faith in the mercy of Allah SWT, cultivating a humble and devoted attitude towards Allah SWT, fostering compassion and kindness, nurturing hope, seeking pleasure and fearing Allah SWT, confronting problems with composure rather than avoiding them, valuing oneself, and having self-confidence. Lastly, there is the multi-method, which is a fusion or amalgamation. Among the methods encompassing cognitive, behavioural, and emotional aspects, there are practices that involve faith in Allah SWT. and Al-Quran, such as remembering and fearing Allah SWT., performing acts of charity, practicing religion, demonstrating patience in dealing with and resolving problems, engaging in jihad fi sabilillah, establishing prayer, zakat, and fulfilling other religious obligations, as well as engaging in positive social interactions.

Achour et al. (2015) conducted a qualitative study on An Islamic Perspective on Coping with Life Stressors. Achour et al. argue that the coping approach for dealing with stress is based on an Islamic perspective, which involves the adoption of Islamic spirituality, worship, and moral discipline. From an Islamic perspective, six coping strategies that can be employed to effectively handle stress include having unwavering faith in Allah SWT, engaging in regular prayer and remembrance of Allah SWT (dhikr), cultivating patience and forgiveness, maintaining a positive mindset, and providing support to both family and society.

Firstly, it is essential to have unwavering faith and belief in Allah SWT, as emphasised in the Al-Quran, specifically in the surah Al-An'am (6) verse 102, ذَٰلِكُمُ ٱللَّهُ رَبُّكُمۡۖ لَآ إِلَٰهَ إِلَّا هُوَۖ خَٰلِقُ كُلِّ شَيۡءٖ فَٱعۡبُدُوهُۚ وَهُوَ عَلَىٰ كُلِّ شَيۡءٖ وَكِيلٞwhich signifies that Allah is the one and only Lord, the creator of everything, and therefore, it is imperative to pray to Him as He is the sustainer of all things. Additionally, the surah Hud (11) verse 123 وَلِلَّهِ غَيۡبُ ٱلسَّمَٰوَٰتِ وَٱلۡأَرۡضِ وَإِلَيۡهِ يُرۡجَعُ ٱلۡأَمۡرُ كُلُّهُۥ فَٱعۡبُدۡهُ وَتَوَكَّلۡ عَلَيۡهِۚ وَمَا رَبُّكَ بِغَٰفِلٍ عَمَّا تَعۡمَلُونَhighlights that Allah encompasses the secrets of the heavens and the earth, and all matters ultimately return to Him. Therefore, engage in prayer and place your complete reliance on Him. Furthermore, your actions will not take God by surprise. (RI 2022). It is mandated for Muslims to have unwavering faith in the absolute authority of Allah SWT. And have faith in the supreme wisdom of all of God's designs. This is because having complete faith in the omnipotence of Allah SWT will diminish worry and enhance the conviction that there exists a remedy for every predicament.

Next, complete your prayer. Prayer in Islam is a highly efficacious technique for alleviating stress. Request a little respite for the physical and psychological individual from the exhaustion and strain caused by daily activities. Prayer serves as a method for individuals to establish a stronger connection with their Creator, resulting in a state of tranquilly within their hearts. This verse is found in Al-Baqarah (2) يَٰٓأَيُّهَا ٱلَّذِينَ ءَامَنُواْ ٱسۡتَعِينُواْ بِٱلصَّبۡرِ وَٱلصَّلَوٰةِۚ إِنَّ ٱللَّهَ مَعَ ٱلصَّٰبِرِينَof the Al-Quran, and it addresses the believers, saying, "O you who believe! Kindly seek assistance from Allah by practicing patience and engaging in prayer. Indeed, Allah is in the company of those who demonstrate patience" (RI, 2022).

Thirdly, engage in dhikr (remembrance) of Allah SWT (Subhanahu wa Ta'ala). That is, one should recall Allah, who has the ability to perform prayer, recite the Koran, praise, and supplicate. I hope that this conviction could alleviate levels of anxiety, stress, and conflict. In the Quran, specifically in Surah Ar-Ra'ad (13) verse 28 ٱلَّذِينَ ءَامَنُواْ وَتَطۡمَئِنُّ قُلُوبُهُم بِذِكۡرِ ٱللَّهِۗ أَلَا بِذِكۡرِ ٱللَّهِ تَطۡمَئِنُّ ٱلۡقُلُوبُ, it is said that

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people who have faith and a tranquil heart find serenity in remembering Allah. According to RI (2022), Allah's heart can only become peaceful through remembrance. In times of adversity, Islam encourages individuals to seek solace in contemplation of Allah SWT in order to attain inner tranquilly.

Furthermore, exercise patience and practice forgiveness. The Quran extensively addresses the concept of patience and advises Muslims to cultivate patience, as it promotes a state of tranquilly and reduces stress levels. Patience is seen as a significant marker of superior quality and essential spirituality and ethics for achieving achievement. The explanation can be found in verse 200 of the Al-Quran surah Ali-Imran (3), يَـٰٓأَيُّهَا ٱلَّذِينَ ءَامَنُواْ ٱصۡبِرُواْ وَصَابِرُواْ وَرَابِطُواْ وَٱتَّقُواْ ٱللَّهَ لَعَلَّكُمۡ تُفۡلِحُونَ
which addresses the believers and states: Exhibit patience and fortitude in your actions, remaining steadfast at the frontier of your country. Maintain a reverent fear of Allah, as it will bring you good fortune. (RI, 2022) Patience is a means to establish a close connection with Allah SWT, as mentioned in Surah Al-Anfal (8), verse
وَأَطِيعُواْ ٱللَّهَ وَرَسُولَهُۥ وَلَا تَنَٰزَعُواْ فَتَفۡشَلُواْ وَتَذۡهَبَ رِيحُكُمۡۖ وَٱصۡبِرُوٓاْۚ إِنَّ ٱللَّهَ مَعَ ٱلصَّـٰبِرِينَ46
This verse emphasises the importance of obeying Allah and His Messenger, refraining from disputes that weaken one's faith and resolve, and maintaining patience. Indeed, Allah is in the company of those who demonstrate fortitude. (RI2022).Competent individuals Exercising patience will result in receiving blessings, kindness, and guidance from Allah SWT., as mentioned in Surah Al-Baqara (2) verses 155 وَلَنَبۡلُوَنَّكُم بِشَيۡءٖ مِّنَ ٱلۡخَوۡفِ وَٱلۡجُوعِ وَنَقۡصٖ مِّنَ ٱلۡأَمۡوَٰلِ وَٱلۡأَنفُسِ وَٱلثَّمَرَٰتِۗ وَبَشِّرِ ٱلصَّـٰبِرِينَ

This verse indicates that individuals would be tested with many challenges, like fear, hunger, loss of possessions, loss of loved ones, and scarcity of resources. And convey this message of happiness to those who demonstrate patience, specifically those who, when faced with overwhelming calamity, utter the words "ٱلَّذِينَ إِذَآ أَصَـٰبَتۡهُم مُّصِيبَةٞ قَالُوٓاْ إِنَّا لِلَّهِ وَإِنَّآ إِلَيۡهِ رَٰجِعُونَ" (verily we belong to Allah, and to Him we shall return) (156). It is they who will attain pardon and kindness from God, and they are the ones who get divine guidance.Furthermore, within the context of Islam, adopting a positive mindset is considered an effective approach for problem-solving and alleviating stress. Positive thinking is a reflection of profound contemplation on faith and the all-powerfulness of Allah SWT. Both faith and clear thinking are crucial elements for cultivating a pleasant and thriving life. Adopt a good mindset towards Allah SWT. Developing cognitive and perceptual patterns, emotional intelligence, and problem-solving skills can greatly benefit one's social interactions. (Machouche et al. 2012) Adopting a positive mindset is closely linked to one's mental well-being, life satisfaction, psychological functioning, social engagement, and personal growth. (Rusydi 2012).

Facilitate the development and growth of a social community or society. Islamic teachings strongly advocate for Muslims to engage in social engagement and establish connections within society. Muslims participate in a variety of communal rituals during public worship, such as congregational Salat Fardhu in the mosque, Friday prayers, Eid al-Fitr prayers, Eid al-Adha prayers, pilgrimage, and other forms of worship. Within social interactions, individuals who adhere to the Muslim faith are unable to discriminate against others on the basis of race, colour, complexion, gender, or social standing, as they recognise the inherent unity of all members within society. Public support is crucial for people who are experiencing difficulties, tragedies, or stress. Each Muslim bears a moral obligation to offer emotional, spiritual, religious, and even theoretical assistance to individuals who require it. Universal support for social care is essential for individuals of all age groups, including children, adolescents, adults, and the elderly.There is a notable association between social support and happiness (subjective wellbeing) in adolescents. (Tarigan 2018), students (Thohiroh et al. 2019), and adults (Samputri and Sakti 2015). Sudan states that there is an additional qualitative study examining stress management among pupils from both traditional and Islamic viewpoints. Islamic teachings encompass a holistic approach to healthcare, incorporating spiritual, psychological, and material means to promote comprehensive well-being.In the Al-Quran, specifically in Surah Al-Isra,verse 82, وَنُنَزِّلُ مِنَ ٱلۡقُرۡءَانِ مَا هُوَ شِفَآءٞ وَرَحۡمَةٞ لِّلۡمُؤۡمِنِينَ وَلَا يَزِيدُ ٱلظَّـٰلِمِينَ إِلَّا خَسَارٗا it is said that the Qur'an has been revealed as a remedy and blessing for the believers, whereas for the wrongdoers, it would only result in further losses. (RI, 2022).In Surah Ash-Shu'ara' verse 80, وَإِذَا مَرِضۡتُ فَهُوَ يَشۡفِينِ it is said that God is the ultimate healer while I am afflicted with illness. (RI, 2022). Multiple methodologies can be employed. The first requirement is to possess unwavering trust in or belief in Allah SWT. Due to the divine will of Allah SWT, only He possesses the ability to bestow healing; it was He who inflicted disease, and He also grants healing. Likewise, engaging in the act of reading the Quran during moments of sadness, tension, and anxiety would provide a profound sense of tranquilly. Additionally, it is advisable to ingest foods or medications that were endorsed by the Prophet Muhammad PBUH, such as honey, black cumin, black seed, and olive. It is also important to eat wholesome and permissible food, as well as provide sufficient relaxation. Lastly, engage in prayer for Allah SWT. Practicing prayer with unwavering faith empowers an individual.

Adriani and Yustari (2019) To conduct a qualitative study on the use of religious activities as a means of stress management among young Muslims in Indonesia. Evidence from studies suggests that individuals perceive religion as a potential solution to alleviate the stress caused by various factors, including those who engage in reading the Koran and participating in religious institutions. Nevertheless, certain individuals argue that religion does not assist them in their comprehensive experience of modest problems. A comprehensive study titled "The Role of Stress Management in Self-Efficacy: A Case Study in the Tehran-Based Science and Research Department of Islamic Azad University Natural Resources and Agricultural Faculty Students" discovered a correlation

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between method-focused coping strategies and self-efficacy. The study methodology employed is correlational.Khaleghi and Najafabadi (2015)

Mohammadinia et al. (2015) Additionally, conduct research. Several references on stress management in disasters, drawing from the Holy Quran, highlight several religious approaches elucidated in the Quran. These approaches can effectively mitigate tension and foster tranquilly in the heart and mind. One such approach is firmly believing that sustenance is predestined by Allah SWT. Prioritise wholehearted belief in Allah SWT, engaging in dhikr, doing prayers, reading and listening to the holy Quran, contemplating the purpose of creation, and practicing patience.Sodri (2018) To conduct a qualitative descriptive study on the practice of prayer in shaping the character of Muslim individuals, specifically focusing on students from SMAN 2 Medan who participated in the Pray Tazkira Assembly in North Sumatra. The activities conducted at the Assembly include collective recitation of prayers, recitation of religious texts, listening to religious teachings, and group prayers.Zulkarnain (2020) subsequently To do research or engage in academic investigations Citations regarding prayer psychotherapy as a method for managing internal stress enhance the well-being of the soul. According to Zulkarnain's research at the library, prayer has therapeutic qualities that can improve both physical and psychological well-being.

CONCLUSION

In conclusion, According to the aforementioned explanation, it was discovered that only 10 out of the total 50 articles conducted experimental studies on stress management methods from an Islamic standpoint. The intervention or training conducted includes reciting Al-Quran dhikr (7 sessions), reciting 1 article, performing prayer (1 session), and praying (1 session). In addition, there are several papers that do not involve experimental studies but rather focus on qualitative and quantitative correlational research. This demonstrates the limited utilisation of experimental methods in studying stress management from an Islamic standpoint. Instead, a significant emphasis is placed on conducting extensive theoretical research, exploring many perspectives, and offering opinions to enhance stress management techniques. This presents a dilemma for scientists who identify as Muslims. In order to conduct a research experiment, you can assess the efficacy of stress management techniques.

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WEAVING THROUGH PAIN: UNDERSTANDING THE HEALTH HAZARDS OF WEAVERS

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ABSTRACT
Power loom and handloom industry are one of those few industries where practically all the family members are involved in either weaving or allied activities. Weaving is the ancient art of transforming threads into tapestries of beauty and utility, often hides a darker narrative - one of occupational health hazards that silently weave their way into the lives of those who practice it. From musculoskeletal disorders, eyesight problem to respiratory illnesses, weavers pay a significant price for their dedication to their craft. This article aims to unveil these hazards, their causes, and advocating for a healthier and more sustainable weaving future.

KEYWORDS: *occupational health hazards, power loom and handloom weavers, government policies.*

INTRODUCTION

Weaving, an ancient and revered craft, transforms threads into intricate textiles that are both beautiful and functional. However, this art form conceals a darker reality: the significant occupational health hazards that affect the weavers. From musculoskeletal disorders to respiratory illnesses, the physical toll on weavers is profound. Additionally, the psychological stresses associated with long hours, economic instability, and inadequate working conditions further exacerbate their challenges. This article delves into these hidden health issues, examining their causes and proposing potential solutions. By shedding light on these concerns, we aim to advocate for a healthier, safer, and more sustainable future for weavers, ensuring that the legacy of their craft continues without compromising their well-being. Weavers, while creating beautiful textiles, grapple with several health issues. Let us examine some of the common hazards:

Metgud et al. (Cardio-Respiratory and Musculoskeletal Profile): A study on women workers in a woollen textile factory revealed that 91% of subjects experienced musculoskeletal pain, with postural pain in the lower back (47%) and neck (19%).

Alka Goel and Isha Tyagi (2012): in this study the author as studied on the occupational health hazards related allied to weaving. The study conducted in Mahua Dabra village, near Jaspur in Uttarakhand, where 70 handloom weavers were personally interviewed and gathered the data related to health problems, they are facing related to weaving occupation. The author found inhaling woollen fibre causes respiratory diseases as the do work without wearing mask and bobbin winding is seating poster work where weavers sit for 4 to 6 hours which causes postural health hazards. In the same way the author says about all the heath related problems weavers faces during weaving process. And he suggests weavers should be provided well-ventilated room and have health camps for weavers.

Dogra (2009), Indian weavers have multi-faceted problems. They survive on unbelievably low wages, are under high debts perennially and have a very low level of education. All of these lead the handloom weaver to a life of insecure livelihood many a times on the threshold of starvation. Thus, it is not surprising that a significant number of young weavers are giving up the traditional occupation and moving towards greener pasture.

OBJECTIVES

- To know the health status of the weavers.
- To Identify the causes of health problems among the weavers.

METHODOLOGY

This study used a combination of mixed research methods, a census was collected of weavers to understand the socio demographic, in-depth interviews were conducted to collect data regarding the health risks and working conditions of power loom and handloom weavers face. Data from two units were selected for the study: Ramdurg taluk in the Belagavi district and Hungund taluk in Bagalkot district of Karnataka. 300 respondents were chosen randomly from each taluk.

Musculoskeletal Problems

The repetitive nature of weaving, involving prolonged sitting, awkward postures, and intricate hand movements, takes a toll on the musculoskeletal system. Work-related musculoskeletal disorders (WMSDs), such as backache, neck pain, carpal tunnel syndrome, and tendonitis, are prevalent among weavers worldwide. Studies in India, Pakistan, and Iran report high incidences of these issues, impacting weavers' physical well-being and productivity.

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Respiratory Issues: (Breath of Dust)
Weaving environments, especially in small workshops, are often poorly ventilated and dusty. Fibers, dyes, and other airborne particles can lead to respiratory illnesses such as asthma, bronchitis, and allergic reactions. This risk is amplified in situations where natural ventilation is scarce or synthetic fibres are used. Weavers inhale dust, fibres, and other particulate matter, leading to respiratory problems.

Eye Sight Problem
The health hazards faced by weavers extend beyond the immediate physical realm. Studies suggest correlations between weaving and visual impairments, likely due to the strain of focusing on intricate patterns under poor lighting conditions. Additionally, psychological stresses arising from long working hours, low wages, and economic uncertainty can take a toll on mental well-being.

Joint Pain
This problem is common among weavers due to poor ergonomics, extended sitting, manual manipulation of heavy materials, repeated actions, and inactivity, weavers frequently experience this issue. Painful joints, stiff joints, and injuries from repetitive strain are all caused by these things. Among weavers we can even find other health problems like obesity problem, blood pressure, and sugar.

Government schemes and policies for the health benefits of weavers
Group Insurance Scheme (Mahatma Gandhi Bunkar Bima Yojana)
Through LIC of India, a group insurance plan for handloom weavers is being established. The program is open to all types of handloom weavers between the ages of 18 and 59 (K.H.D.C., Co-ops, and disorganized). In addition to the advantages, the LIC offers scholarship for the children of weavers through the Shikshak Sahayog Yojana. The State Government is providing 50% of the yearly premium payment, or Rs. 40/- weaver beneficiary, to support the handloom weaver's

Health Insurance Scheme: (ICICI Lombard)
ICICI Lombard General Insurance Co. Ltd is the organization responsible for implementing the Health Insurance Scheme for handloom weavers. The program gives the weaver community access to the highest calibre of medical facilities. The weaver, spouse, and two children are covered by the plan. It keeps a sizable amount set up for OPD and covers all newly discovered and pre-existing conditions.

Health Scheme
Reimbursement of the medical expenditure for treatment of Cancer (maximum limit Rs.50.000/-) and financial assistance of Rs.500 per annum during the treatment Period.

Reimbursement of the medical expenditure for treatment of Heart operation and transplantation of Kidney (maximum limit Rs.50.000/-) and financial assistance of Rs.500/- per annum during the treatment period.

Financial assistance to mentally retarded and leprosy patients (Rs.500/- per annum).
Rs.1000/- will be paid to the family members for cremation of the deceased weaver.

CONCLUSION
Weaving is not just about creating beautiful fabrics; it is about the lives and livelihoods of the artisans behind them. Recognizing and addressing the health hazards they face is crucial for ensuring their well-being and the sustainability of this age-old craft. By implementing ergonomic improvements, prioritizing safe working environments, and advocating for fair working conditions, we can weave a brighter future where the beauty of the craft is not overshadowed by the shadows of health risks. Weaving, an age-old craft that produces exquisite textiles, is intertwined with significant health risks for those who practice it. Addressing these hazards is vital to ensure the well-being and sustainability of this profession. By understanding the health challenges faced by weavers—ranging from musculoskeletal disorders to respiratory illnesses—and implementing targeted solutions such as ergonomic improvements, proper ventilation, and mental health support, we can create a safer and more supportive working environment. Ensuring fair wages and social security further contributes to their overall well-being. Ultimately, the goal is to weave a future where the beauty of the craft is matched by the health and happiness of its artisans.

Solutions for Weaver's Occupation Health Hazards
- Adjustable chairs and tables, proper lighting, and footrests reduce strain.
- Regular stretching and strengthening exercises are beneficial.
- Educate weavers on good posture and proper techniques.
- Promote health awareness and symptom recognition for a healthy lifestyle.
- Conduct regular health checks and provide on-site healthcare.
- Perform ergonomic assessments and enforce safety regulations.
- Use anti-fatigue mats, supportive cushions, ergonomic sensors, and exoskeletons.
- Install proper ventilation or increase natural airflow.
- Provide masks and respirators.
- Use hypoallergenic natural fibres or safer synthetic options.
- Ensure adequate and adjustable lighting.
- Provide access to counselling services and supportive work environments.
- Ensure fair wages and access to social security.

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RHETORIC IN RELIGIOUS DISCOURSE: ELICITATION AND DIALOGUE AS DRAMATIC PAUSE IN NIGERIAN PENTECOSTAL SERMONS

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ABSTRACT

This study examines the use of elicitation, as well as dialogic interrogation and dialogic repetition, as devices for dramatic pause in Nigerian Pentecostal sermons. Sermons are by their nature, usually monologic, in which the preacher monopolizes the conversation space from commencement to conclusion. The congregation usually is expected to sit through it all, listen and imbibe the message. This trend, noted mainly in orthodox Christianity circles, has been observed to often lead to boredom and attention fatigue in the audience. This study notes that Nigerian Pentecostal preachers, while still wholly in control of the sermon, appear to have effectively reversed its monologic nature by employing elicitation and dialogue as audience-engaging and attention-arresting devices to introduce unique pause effects in their sermons, thereby creating that general impression of vitality and activity often associated with the Nigerian Pentecostal brand of Christianity. This study identified these devices as discursive practices embedded in the social practice of Pentecostal preaching, which are among the principal ways in which its ideology is circulated and reproduced. This present study constitutes a part of a general intellectual investigation, which involves the identification of specific discursive patterns that characterize Nigerian Pentecostal Christian sermons and to determine how they are intertwined with the general ideology of persuasion as a goal.

KEYWORDS: *rhetoric, elicitation. dialogue, Pentecostal sermons*

INTRODUCTION

Religious discourse, alongside all intra-faith linguistic interaction among clergy and laity for evangelical, ecclesiastic and other social functions, has evolved over the years into a sociolinguistic phenomenon each with its unique language code within its social community. Religious institutions have had to accommodate the changes brought about by a de-traditionalized, de-centralized, and rationalized social climate. According to Singh (2011), even though these changes are mediated by language, scholars in the past have tended to place more emphasis on the epistemological status and nature of religious beliefs than on religious language itself. However, despite the low-level interest in religious discourse by linguists and anthropologists, the interface between language and religion just cannot be ignored. Holistically, language, including its subparts at both macro and micro levels, is the medium of every communication, even though the basis of communication can differ based on context, genre and situation. Religion, on the other hand, is extensively influential all over the world. It possesses and has demonstrated the potential to affect all parts and aspects of society including lifestyle, science, education, marriage, behaviour, peace, chaos, and ethics. Pentecostal Christianity, on the other hand, is a form of Christianity that emphasizes the work of the Holy Spirit and the direct presence of God in the life of a believer. In Nigeria, Pentecostal Christianity assumed a formidable stature in the last quarter of the 20th century. It is a fact that all religions are growing. "Orthodox" denominations of Christianity, Islam, as well as indigenous and even some far-eastern religions have blossomed to create a veritably pluralistic religious public space. However, Charismatic and Pentecostal groups have shown phenomenal levels of growth. According to Jando (2014:6),

> "Since its inception, the Pentecostal movement has experienced tremendous growth in terms of the proliferation of its churches and its membership strength. Indeed, the explosion of the movement in Nigeria and elsewhere is a glaring reality. Recognizably, Pentecostalism has penetrated the mainline churches. Obviously, Pentecostals are proliferating almost on daily basis and are winning many converts. The growth of Pentecostal churches, which seems uncontrollable, is substantiated in the heavy presence of its churches in every nook and cranny of the Nigerian society."

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According to Barret (1982), one in four Christians in the world is a part of the Pentecostal Movement, while the Centre for the Study of Global Christianity estimated that, there are about 279 million Pentecostal Christians and 305 million Charismatic Christians in the world (Pew Research, 2011). An interesting fact is that this brand of Christianity has had great influence on the orthodox churches as well as on non-Christians. Achunike (2004) confirms this when he asserts that the mainline churches have adopted different names for their own brands of Pentecostalism. For instance, in the Catholic Church, it is called Catholic Charismatic Renewal of Nigeria. It operates as Evangelical Fellowship in the Anglican Communion (EFAC) and in Methodist Church it is called Methodist Evangelical Movement (MEM).

The origin of Nigerian Pentecostal Christianity, like most others around the world, can be traced through the American Pentecostal movement to the 1900 three-year-long Azusa Street Revival organized by Evangelist Charles Parham in Los Angeles, California. This American root of Nigerian Pentecostalism is still evident in the mode of their activities including the songs and especially the language of ministration. According to the Pews Forum Survey (2006), in Nigeria, there are over 5000 Pentecostal denominations as at the time of the survey; and the number continues to grow. This work will attempt an ethnographic appraisal of Nigerian Pentecostal Christianity, which in recent years has developed into a social phenomenon with its own unique language code. The research will attempt to analyze the structure of utterances by both clergy and laity for evangelical and ecclesial functions, especially in the sphere of sermon preaching and teaching.

One major characteristic of the Pentecostal movement is the attached modernism and blend with contemporary social cultures. Old 'orthodox' values are largely dropped as part of the strategies to "capture the youth for Christ". The movement is considered to be more amenable to social change and more readily accepts and adopts new technologies into their programmes. This group pioneered electronic evangelism in Nigeria and recently has massively keyed into the use of the internet and social media for their activities. Ojo (2004: 2) observes that "Pentecostalism in Nigeria presently constitutes a major social movement and Pentecostal spirituality continues to affect millions of citizens in various ways." The Pentecostal sect of the Christian religion in Nigeria is often seen as a "modern version" of the religion. The notion of "modernity" attached to the sect consists in several factors ranging from the non-formal clergy establishment, unofficial clergy accoutrement, relaxed orthodox practices like head-covering, relaxed gender restraints, and appropriation of digital media technology among others. One factor which, more than any above, has entrenched the notion of modernity is the language factor. One of the major defining characteristics of Nigerian Pentecostal Christianity is the real or attempted Americanization of the language of ministration. A "good" Pentecostal minister is therefore one who is seen to be fluent in the English language; where one of the properties of fluency is speaking the language with an American drawl or accent. Another major characteristic of the NPCL is the oratorical performance rather than the message content of sermonic ministrations. The style of preaching is exuberant, enthusiastic, and charismatic, interspersed with songs, questions, declarations, and folk style. This is in sharp contrast with the liturgy, polity, and ethos of the 'orthodox" sects like the Roman Catholic, Anglican, and Methodist denominations. The oratorical content of Nigerian Pentecostal sermons, especially the use of dramatic pause for rhetorical effect in sermons, is the focus of this study.

The Population of the study

The target population for this research consists of all Pentecostal denominations in Nigeria, while the accessible population consists of the Pentecostal denominations in Imo State. The actual numbers of Pentecostal denominations in Nigeria and Imo State are unknown because new denominations daily spring up all around the country, many of them in unmarked buildings and shanties. The most readily available source for this information is the 2006 figures provided by the Pews Research Centre. The Pew Forum's (2006) Pentecostal Survey estimates that six in ten Protestants in Nigeria are Pentecostal in belief. From an estimated number of 2,000 independent organizations in 1997, Pentecostal churches reportedly increased to about 5,000 in the year 2000, suggesting a growth rate of about 1000 a year. The projected growth rate between the year 2000 and the present will put the number of Pentecostal denominations well above 10,000.

Sample and Sampling Techniques

This study is limited in scope by the sheer number and spread of the Pentecostal denominations in Nigeria. Due to the nature of the study, and the need for exactitude and detail, the researcher employed simple random sampling and purposive sampling techniques.

At the first stage of simple random sampling, a total number of ten (10) Pentecostal denominations within Imo State were randomly selected. Sermons were directly recorded at some of the selected churches, while already recorded audio recordings of sermons were procured from some. Some of the selected churches have digital audio recording facilities with which sermons are regularly recorded and distributed or sold to church members and any other person who might require them the sermons were recorded or already recorded recent sermons procured. All recorded sermons were then transcribed for analysis.

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The second stage involved employing purposive sampling to select five (5) of the recorded and transcribed sermons. The research corpus thus comprises five (5) sermons in English that were purposively selected. The corpus set amounts to 54,273 words in total.

List of Sample Sermons

S1 - Recorded Sermon 1: "The Woman with the Issue of Life" by Pastor Mrs Henrietta Jacobs of the New Wave Assembly.

S2 - Recorded Sermon 2: "Establishing Liberty and Advancing the Kingdom" by Pastor Dennis Inyang of the Sure Word Assembly

S3 - Recorded Sermon 3: "Abba Father – Part 3" by Pastor E.A. Adeboye of the Redeemed Christian Church of God. *(Procured at The Redeemed Christian Church of God, Umuanunu Junction Obinze, Owerri West, Imo State.*

S4 - Recorded Sermon 4: "Season of Change" by Rev. Simeon Afolabi of the Firstlove Assembly, Owerri.

S5 - Recorded Sermon 5: "Blessings from Psalm 23" by Pastor A. C. Ohanebo of the Watchman Catholic Charismatic Renewal Ministry.

Research Instruments

This study attempted to analyze language usage in a natural setting, such as the analysis of language use in specific contexts and situations. The study is descriptive and qualitative and relies on qualitative description using words rather than statistics. The study evaluates the sermons of Nigerian Pentecostal denominations as valid samples of typical Pentecostal Christian discourse by analyzing the rhetoric of its discourse, the forms and functions of its codes, the forms of its speech acts, and the characteristics of its language and specific terms. By the nature of the research, the recording of speech sounds for data collection is required. Data was collected through audio recording of sermons using digital audio recorders in some of the churches and procuring already recorded sermons in audio formats from others. The transcription of the recordings was done using the *SpeechTexter*® application which requires direct audio input through a microphone connected to the computer in order to convert speech into written texts. In terms of the quantitative examination, selected tools of corpus analysis comprising *AntConc321*® and *Design215 Wordlist Maker, Version 1.6* were used.

Methods of Data Analysis

This study analyzed the sample sermons using a socio-pragmatic approach by considering elements of the language and, in addition, attempted to establish social, situational and cultural factors for the identified discursive patterns. Transcribed recorded sermons were transcribed and analyzed in order to identify texts embedded in the rhetorical patterns of elicitation, dialogic interrogation and dialogic repetition used as devices for dramatic pause in sermons.

Rhetoric

Rhetoric is an art of discourse, which studies and employs various methods to convince, influence and, at the same time, please an audience. Often, we find rhetoric in religious discourse and political speeches. They aim to make comparisons, to evoke tender emotions, to censure rivals all to the end of persuading listeners. Rhetoric has thus become an identified characteristic of Pentecostal sermons. This is a fact that researchers like Adedun and Mekiliuwa (2012) and Obuasi (2014) have established in their works. This work aims to determine how Pentecostal preachers in Nigeria use elicitation and dialogic repetition as rhetorical or persuasive devices in the course of elucidation of a particular point of view or in the clarification of an issue in such a manner that differentiates them and establishes for them a community of unique identity.

Dramatic Pause

Dramatic pauses are the verbal punctuation marks of sermons. They involve the use of certain expressions which serve as gap fillers in a sermon. Wharryl (2003) referred to this device as a "Textual Boundary Marker", with the functions sub-classified into three categories: text type change, topic/sub-topic boundary, and topic continuity. According to Wharry (2003:210)

> …a significant function appeared on the surface to be simply as verbal filler, but these expressions actually functioned not only to give preachers time to think about their next statements or to fill space while members of the congregation were caught up in the spirit.

Preachers often use this device to initiate new subsections of the discourse, to set key terms apart, to mark discourse boundaries and mainly to allow a powerful idea to sink in. As a transitory device, it also indicates a shift in discourse and marks a change in discourse direction. It is also used to highlight surprises in the text, to activate the congregation into entering a feeling or thought or simply to

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stimulate anticipation. Such expressions include: *"Praise the Lord!", "Oh, my God!", "Hallelluyah, somebody!" etc.,* which the preachers use at intervals both as gap-fillers and to activate the attention of their audiences.

There are several kinds of pauses in speech: transition pause, sense pause, reflective pause, pause-for-effect, pause-for-emphasis and dramatic pause; each of which serves similar but slightly different purposes in spotlighting specific parts of a speech. However, this study is specifically concerned with the dramatic pause as employed by Nigerian Pentecostal preachers in their sermons.
The Dramatic Pause is a very effective rhetorical and oratorical device in persuasive speeches such as sermons and political discourse. The dramatic pause consists of a short moment of silence with no dialogue or sound. Also known as the "pregnant pause", the dramatic pause is often used to effectively control pace and intonation in speech. Many Pentecostal preachers are known to use filler words (praise the Lord, Amen, praise the name of the Lord, Hallelujah, etc.) as dramatic pauses especially when studying their sermon notes. The dramatic pause as a rhetorical tool helps a speaker to build an intellectual and emotional connection with their audience. It gives the listeners some time to process what has just been said, as well as priming them to stay engaged for what comes next. The dramatic pause differs from the traditional pause in speech, which usually is used to parcellate speeches into smaller units much as a comma does in writing or mark the end of a complete unit of speech and to separate one thought from another, much as a period does in writing. The dramatic pause, on the contrary, is employed not in the traditional sense of marking units of speech but solely to create oratorical effects. Dlugan (2012) described the dramatic pause as "part rhetorical and part theatrical" pause used whenever one wants to generate some drama or suspense.
The dramatic pause as a rhetorical device has the multiple advantages of giving both the speaker and the audience time to reflect as well as boosting the oratorical profile of the speaker as an accomplished public speaker. Waknell (2009) outlined what he referred to as The Four Aims of Presentation to include:

1. **Be heard:** (ensure that the listener can hear properly)
2. **Be understood:** (convey clearly the intended meaning of the message)
3. **Be respected:** (ensure the message is understood so that the audience can accept, believe and act on it as intended)
4. **Be remembered:** (ensure that the impact of the message remains with the listener)

This study identified some commonly utilized devices employed by Nigerian Pentecostal preachers as dramatic pauses: elicitation, dialogic repetition, and dialogic interrogation.

Elicitation
Elicitation as a rhetorical device is a dialogic strategy that has to do with the elicitation for participation and active involvement of the congregation in the sermonic discourse. Akhimien and Farotimi (2018:7) refer to this device as:

> the process of demanding a response, verbal or non-verbal from an interlocutor by questioning. The clergy uses this strategy often to get his audience participate in the service. This is audience participatory device. For instance, shake hands with one or two people and say my God reigns. When he says (?) the entire congregation does this. What this implies is that the audience are steer (sic) up to get involved and his belief about God he transfers to them.

Some writers have also referred to this device as a "summons'. This, according to Osisanwo (2003), is one of the vital techniques used in taking turns. It is also an attention-catching device that Pentecostal pastors often use in catching the attention of the audience or at transitional points of his sermons.

This device serves mainly to keep the attention of the congregation/audience, while at the same time creating the impression that the listeners are active participants in the discourse. The use of dialogic strategies in sermons is a form of meta-discourse that helps the understanding of sermons not only as a persuasive engagement but as a form of social and communicative engagement between preacher and congregation. It elevates the roles of listeners and positions them as conversational partners in sermons. It also helps to temper the preacher's voice of authority. It was observed that Pentecostal preachers make copious use of this device not only as fillers but more importantly at moments before or immediately after a crucial point is made. It creates suspense and heightens anticipation when used before, and gives time for the point to sink in when used after. The use of this kind of audience engagement device during preaching is a technique employed by preachers to encourage listeners to be active and responsive. The sermon thus takes on the shape of a conversation, rather than a monologic presentation.

Generally speaking, this process is a call for a response, which could be verbal or non-verbal. Pentecostal preachers often use this strategy to get their audience to participate in the sermon. As an audience participatory device, listeners may sometimes be asked to perform a speech action such as making a declaration for or against something, providing an answer to a question, or simply repeating what was said by the speaker. The required response may equally be a mental behaviour such as getting up to shake hands with one or two other people, standing up and waving hands to the Lord, or silently thinking out an answer to a question. In the course of this study,

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we discovered that response elicitation in discourse is also a control-activation and control-check device. As a control-activation device, the preacher uses the device to establish his authority over the audience. The exercise of this control is underscored by the fact that all or almost all in the audience are constrained to do his bidding. For example:

Pastor: *You are not in church! Let's share the "Goodness" and go home.*
Congregation: *No, ride on!*
Pastor: *No, let's share the "Goodness"! Surely, Goodness and mercy"....*
Congregation: (interrupting) *Ride on/Fire on, Sir!*

In the sermon above, the preacher used this device in a most powerful form. The statement *"You are not in church!"* is an indication that the preacher was not getting the feedback required. The "threat" to close the service "and go home" was the activator for animating the congregation and securing their attention. This device also grants the power of turn-allocation to the preacher, as he/she gets to activate the audience to participate in the sermon. There was hardly any deviation observed in the audience in the denominations sampled. As a control-check device, preachers use this device to check on the attention and the different linguistic and non-linguistic forms of feedback from the audience. This helps ascertain the perlocutionary effects of the sermonic discourse on the audience.

Taiwo (2006) posits that the context in which the communication takes place goes a long way in determining the kind of response to be elicited as a single speaker cannot dominate the discourse space for too long unless the situation places some constraints on his/her audience to continue to participate in the conversation. Elicitation, as a rhetorical device, also manifests in many forms in sermons as rhetorical questions and dialogic interrogation.

Rhetorical Device	Subset	Presentation	Sample Sermon Source
Elicitation	**Dramatic Pause**	*i.* Let's go!	S1, S2, S4
		ii. Somebody, look into the scriptures.	S1, S6
		iii. Rise to your feet and declare your new level, declare who you are.	S1
		iv. Somebody lift up your voice; open your mouth, open your mouth.	S1
		v. Hey, I don't know how many of you will join me in this assignment. Join me in this assignment to make man whole.	S1
		vi. Let me hear it better.	S1,S2,S3, S4
		vii. If you're glad to be here, shout a louder Amen	S3, S4
		viii. Can somebody say Halleluyah!	*All*
		ix. If you believe that say Amen.	S2, S4
		x. Halleluyah, Come on!	S5
		xi. I hope you are getting me.	S2
		xii. Can someone say Halleluya.	S2
		xiii. Someone shout Halleluya.	ALL
		xiv. If you know you are free, can you shout Halleluya!	S2
		xv. Put your hands together for Jesus.	S1,2,4,5
		xvi. Put your hands together for Jesus. Let's give him praise!	S2
		xvii. If you're glad to be here, shout a louder Amen	S2
		xviii. Go ahead, talk to the Almighty God.	S3
		xix. Let somebody shout Halleluyah.	ALL
		xx. Shake hands with one or two people and tell him or her, "God is going to bless you mightily tonight."	S3
		xxi. I gotta hear your Amen!	S4

Table 1: Occurrence of elicitation in sample sermons

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Dialogic Repetition

Dialogic repetition involves the preacher asking the audience to repeat some words, clauses or sentences after him or her. It is a clear deviation from the monologic pattern of the orthodox denomination preachers and engenders performative discourse. Like all other types, this device elevates the roles of listeners in preaching and positions them as conversational partners. Dialogic repetition, like other kinds of repetition, is a powerful force in discourse. Repetition generally helps emphasize an idea or concept, call attention to a character trait or draw attention to a seemingly minor detail. Repeated words, information, idea and the structure of an utterance are often used to manipulate a listener's attitude and interest. Effective use of repetition in sermons creates different effects. These range from reinforcing the overall message of the preacher, as well as creating a sense of rhythm, resonance, atmosphere and emotion. This study discovers that this is one stylistic device that presents in various forms, most of which are copiously used by Pentecostal preachers. Dialogic repetition helps draw more of the audience's attention to the sermon through programmed restatements by making them vocalize the preachers' thoughts and words in synchrony. According to Adedun and Mekiliuwa (2010), the overall effect of this is to heighten the emotional tone of the speech thereby making it more memorable. According to them, repetition in discourse is a form of "back channelling, gap filler, a cohesive device in discourse", which performs the purpose of a memory aid used to reinforce or emphasize points made by speakers.

For example

Pastor: Say I forbid sickness from coming to me.
Congregation: I forbid sickness from coming to me.
Pastor: Sickness and disease, I forbid you.
Congregation: Sickness and disease, I forbid you etc**.**

In the example above, the preacher not only used the exchange to reestablish rapport with the audience and to bring the emotional tone of the sermon to a high, it is also bound to create a sense of harmony in the congregation as they actively participate in the declarations alongside the pastor, as well as generally helping the preacher to drive home some critical points and contributes to the rhetorical impact of sermons.

Rhetorical Device	Subset	Presentation	Sample Sermon Source
	Dialogic Repetition	i. **Pastor:** Somebody lift your hand and say 'I have capacity, but I am asking for more, Lord.' **Congregation**: I have capacity, but I am asking for more, Lord. **Pastor:** I am asking for more. **Congregation:** I am asking for more. **Pastor:** I am asking for more. **Congregation:** I am asking for more. **Pastor:** Lift your hand and say "there is more to me!" **Congregation:** There is more to me! **Pastor:** Say there is more to me than I can imagine **Congregation:** There is more to me than I can imagine	S2 S1
		ii. **Pastor:** Say I forbid sickness from coming to me. **Congregation:** I forbid sickness from coming to me. **Pastor**: Sickness and disease, I forbid you. **Congregation**: Sickness and disease, I forbid you.	S2
		iii. **Pastor:** Can you lift your hand and say I am free. **Congregation:** I am free. **Pastor:** In Christ I have liberty. **Congregation:** In Christ I have liberty.	S2

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		Pastor: I am free. **Congregation:** I am free. iv. **Pastor:** Can you say I am free from the power of darkness. **Congregation:** I am free from the power of darkness. **Pastor:** I am free from the forces of evil. **Congregation:** I am free from the forces of evil. v. **Pastor:** My liberty cannot be curtailed anymore. **Congregation:** My liberty cannot be curtailed anymore. **Pastor:** Because I am free! **Congregation:** Because I am free! vi. **Pastor:** Say Father, we have come to you tonight as your children **Congregation:** Father, we have come to you tonight as your children vii. **Pastor:** Let me hear you say Please carry us in your arms and bless us. **Congregation:** Please carry us in your arms and bless us. **Pastor:** Say We have all come as children, Lord **Congregation:** We have all come as children, Lord viii. **Pastor:** Can somebody say Restore! **Congregation:** Restore! **Pastor:** One more time, say Restore! **Congregation:** Restore ix. **Pastor:** Season of what? **Congregation**: Season of change. **Pastor:** I can't hear you.. **Congregation**: Season of change! **Pastor:** You will know indeed that this is…? **Congregation:** A season of change! **Pastor:** Key into the spirit! Help me to tell your neighbour, "Key into the spirit!" **Congregation:** "Key into the spirit!" **Pastor:** I can't hear that! Key into the spirit! **Congregation:** "Key into the spirit!" **Pastor:** Say again, "Key into the spirit!" **Congregation:** "Key into the spirit!"	S2 S3 S5 S3 S6 S4 S4

Dialogic Interrogation

Dialogic interrogation in sermons involves the preacher asking direct questions that require direct responses from the congregation. The preacher often employs it to check on the audience's attention to achieve his perlocutionary goals. A secondary function is that it equally

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serves to sustain the attention of the audience. Yet another function of this device is to make listeners reevaluate their understanding of the sermon content, as well as to provide reassurance to listeners that they have, indeed, got the message (Long, 2005).

i. **Pastor**: Upon every man! Upon how many?
Congregation: Every man! (S1)

ii. **Pastor**: Are you there?
Congregation: Yes, Sir (S4)

iii. **Pastor**: We have been freed from what?
Congregation: Fear!/From fear! (S2)

Rhetorical Device	Subset	Presentation	Sample Sermon Source
	Dialogic Interrogation	*i.* Upon every man! Upon how many?	S1
		ii. Are you there?	S2,S5,S6
		iii. True or false?	S5
		iv. We have been freed from what?	S2
		v. He has delivered… He has what? …He has what?	S2
		vi. I have been delivered from what?	S2
		vii. This is the what?	S2,S5
		viii. That God has given us what?	S2
		ix. I told you that you have what...? Your new name is the woman with the issue of what?	S1
		x. Did you see it there?	S1, S4
		xi. Are you connecting the two…this word… to your new name?	S1
		xii. When? I'm asking you, Church, when?	S1
		xiii. Do you know that the Bible says that God will never afflict you? Do you know that?	S1
		xiv. Have you found it in Scripture?	S1
		xv. He says if you know how to give good gifts to your children, how much more will your what?	S1
		xvi. Have you seen that God created you to be made whole?	S1
		xvii. Anyone who can at least look at the face of the nation in the past six months…between December and now, you will know that indeed this is what?	S4
		xviii. **Pastor:** Are you with me?	S4
		Congregation: Yes, Sir!	
		Pastor: Then about two months ago, they called him Acting President. Then about a week ago, they called him what?	S2
		Congregation: President!	
		If you can read the face of the nation, you will know, truly, this is… what?	S1, S2, S3, S5
		Congregation: Season of change!	S2, S3, S5
		xix. Are we together?	S2
		xx. Please are you flowing with me?	
		xxi. Come on, is someone getting that?	S4
		xxii. Come on, tell me, which one does he have?	
		xxiii. How many of you know the song? You want to sing it for me?	
		xxiv.	

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Both elicitation and dialogue are constantly employed as rhetorical tools in Nigerian Pentecostal sermons, and the multi-sensory experience created by their use goes beyond mere spoken words. Their use engenders a deep connection between the preacher and the congregation and activates the emotional involvement and engagement of the congregation. Elicitation and dialogic interrogation in sermons serve to engage the congregation, making the sermon more interactive and participatory. They enhance understanding by demonstrating different interpretations of scriptures, promote reflection by encouraging the congregation to connect scripture passages to their lives, and facilitate learning by allowing for questions and discovery of answers. They also introduce an element of spontaneity and joy, often bringing transformative laughter to the congregation.

CONCLUSION

In conclusion, this study has demonstrated the significant role of rhetoric in Nigerian Pentecostal sermons, specifically the strategic use of elicitations and dialogue as a dramatic pause to engage congregants and facilitate spiritual experience. By analyzing these sermons' linguistic and discursive features, we have uncovered how Nigerian Pentecostal preachers skillfully employ rhetorical devices, especially dialogue and elicitation as dramatic pauses, to create a sense of community, foster emotional connection, and convey religious authority. The findings of this research contribute to our understanding of the complex dynamics of religious discourse and highlight the importance of rhetoric in shaping the beliefs, practices, and identities of Nigerian Pentecostal communities. Furthermore, this study underscores the value of interdisciplinary approaches to the study of religious language, combining insights from linguistics, religious studies, and performance studies to illuminate how rhetoric animates religious experience. Ultimately, this research invites further exploration of the intersections between rhetoric, religion, and culture, and encourages scholars to continue examining how language shapes our understanding of the sacred and the self.

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AN EFFICIENT EV CHARGING PATH WITHWIRELESS POWER TRANSFER TECHNOLOGY

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ABSTRACT

This research proposes an innovative solution forwirelessly charging electric vehicles using dynamic wireless power transfer, which incorporates solar panels for feasible charging. The system relies on resonant inductive power transfer between the coils installed beneath the road surface and a receiver coil placed on the vehicle.An experimental validation was conducted using a hardware setup. The overall system showcases power transmission to charge the vehicle's battery while in motion, eliminating the need to wait for a full battery charge.

I. INTRODUCTION

The gradual deterioration of air quality has popularized electric vehicles as a viable alternative to gasoline powered internal combustion engine (ICE) vehicles. Electric vehicles,equipped with electric motors and high-energy storage devices, offer greater convenience than gasoline- and diesel-powered vehicles. However, the lack of robust charginginfrastructure and high vehicle costs have hindered the rapidgrowth of Electric Vehicles (EVs) in the transportation sector. Various research approaches have been explored in relation to the EV charging methods. Conductive charging involves plugging a cable into an AC source to charge the battery (Budhia et al. 2011). This requires an immediate connection between the power source and the battery. However, this method poses challenges, such as time requirements, determining suitable installation locations, traffic disruptions due to frequent shutdowns, and managinglarge cables connected to EVs (Hul, 2013). Wireless charging offers significant potential for overcoming these limitations (Bolger et al., 1978). It offers advantages such asenhanced safety and ease of charging under stationary or dynamic conditions.

II. LITERATURE REVIEW

A. MODELING AND ANALYSIS OF DYNAMIC CHARGING FOR EVS: A STOCHASTIC GEOMETRY APPROACH

With the increasing demand for greener and more energy efficient transportation solutions,electric vehicles (EVs) have emerged to be the future of transportation across the globe. However, currently,one of the biggest bottlenecks of EVs is the battery. Small batteries limit the EVs driving range, while big batteries are expensive and notenvironmentally friendly. One potential solution to this challenge is the deployment of charging roads, i.e., dynamic wireless charging systems installed under the roads that enable EVs to be charged while driving. In this paper, we use tools from stochastic geometry to establish a framework that enables evaluating the performance of charging roads deployment in metropolitan cities.We first present the course of actions that a driver should take when drivingfrom a random source to a random destination in order to maximize dynamic charging during the trip. Next, we analyze the distribution of the distance to the nearest charging road. This distribution is vital for studying multiple performance metrics such as the trip efficiency, which we define as the fraction of the total trip spent on charging roads.Next, we derive the probability that a given trip passesthrough at least one charging road. The derived probability distributions can be used to assist urban planners and policy makers in designing the deployment plans of dynamic wireless charging systems. In addition, they can also be used by drivers and automobile manufacturers in choosing the best driving routes given the road conditions and level of energy of EV battery.

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B. DYNAMIC RESPONSE CHARACTERISTICS OF FASTCHARGING STATION-EVS ONINTERACTION OF MULTIPLE VEHICLES

In view of the existing problems that multiple vehicles interaction in the selection of fast charging stations for electric vehicles (EVs) and the equalizing the service capability by multiple stations game in station-EVs interaction, a dynamic response strategy of fast charging station-EVs considering interaction of multiple vehicles is proposed. According to this, the charging scheme of EVsand the dynamic service fee of charging stations are decided. Firstly, the charging guidance framework ofstation-EVs interaction is proposed to describe the information flow relationship for vehicle, station, road and intelligent transportation system (ITS). Secondly, in order tomeet the diversified needs of car owners in charging selection, a charging navigation model is established. Considering the impact of dynamic path travel time,a dynamic path selection model of urban road network is established based on the road segment transmission model. Thirdly, in order to accurately analyze the interaction process between vehicles, a charging decision-makingmethod is proposed considering the dynamic evolution of EVs, which reflects the station selection probability of different positions during driving. Fourthly, according to thequeuing time of the charging station, the service fee of the charging station is dynamically adjusted to optimize theservice capacity of the charging station, and the multi-agent stackelberg game model is established by combining the charging station selection of EVs with the dynamic service fee of charging station. Finally, Sioux Falls urban road network system is used as an example to analyze the path selection, dynamic decision of charging station selection andservice fee, and station-EVs interaction strategy. The results show that this method improves the efficiency of electric vehicle charging station searching, guides EVs in the road network to charge orderly,balances the charging loadbetween charging stations and optimizes the service capacity of charging station reasonably.

C. ROUTE OPTIMIZATION OF ELECTRIC VEHICLES BASED ON DYNAMIC WIRELESS CHARGING

One of the barriers for the adoption of electric vehicles(EVs) is the anxiety around the limited driving range. Recent proposals have explored charging EVs on the move, using dynamic wireless charging which enables power exchange between the vehicle and the grid while the vehicle is moving. In this paper, we focus on the intelligent routing of EVs in need of charging so that they can make most efficient use of the so-called mobile energy disseminators (MEDs) which operate as mobile charging stations. We present a method for routing EVs around MEDs on the road network, which is based on constraint logic programming and optimization using a graph-based shortest path algorithm. The proposed method exploits inter-vehiclecommunications in order to eco-route electric vehicles. We argue that combining modern communications between vehicles and state of the art technologies on energy transfer, the driving range of EVs can be extended without the need for larger batteries or overtly costly infrastructure. We present extensive simulations in city conditions that show the driving range and consequently the overall travel time ofelectric vehicles is improved with intelligent routing in the presence of MEDs.

D. BATTERY CHARGING METHOD FOR ELECTRIC VEHICLES FROM WIRED TO ON-ROAD WIRELESS CHARGING.

Recent fossil fuel shortages and global warming related problems have caused a substantial shift from internal combustion engine vehicles towards EVs. This paperexplores the thorough review of battery charging infrastructure from wired connection to on-road wirelesscharging for an EV. The initial part of the paper deals with the wired charging and its power electronics infrastructure. The later portion deals with the wireless charging whereboth static and On-Road types are discussed. Furthermore, various aspects of wireless power transfer are also discussed. The Market scenario and future growth prospects are reviewed and presented in last section of the paper.

E. DYNAMIC WIRELESS ELECTRIC VEHICLE CHARGING SYSTEM

Wireless Power Transfer(WPT) utilizing attractivereverberation is the innovation which could set human free from the irritating wires. Indeed, the WPT embraces a similar essential hypothesis which has just been created for something like 30 years with the term inductive power exchange. Recently WPT innovation is growing rapidly . At kilowatts control level, the exchange separate incrementsfrom a few millimeters to a few hundred millimeters with a lattice to stack proficiency above 90%. The makes the WPT very useful to the electric vehicle (EV) charging applications in both stationary and dynamic chargingsituations. This paper surveyed the advancements in the WPT territory material to EV remote charging. By presenting WPT in EVs, the snags of charging time, range, and cost can be effectively relieved. Battery innovation is never again pertinent in the mass market entrance of EVs. It is trusted that specialists could be supported by the cutting edge accomplishments, and push forward the further improvement of WPT just as the extension of EV.

F. DYNAMIC WIRELESS CHARGINGPERFORMANCE ENHANCEMENT FOR ELECTRIC VEHICLES: MUTUAL INDUCTANCE , POWER TRANSFER CAPABILITY , AND EFFICIENCY

Electric vehicles are becoming more popular as an alternative to conventional gasoline powered vehicles. In order to strengthen charging infrastructure, dynamic wireless charging (DWC) is a promising technology throughwhich the vehicle battery can be continuously charged whilethe vehicle is in motion. The main challenge of the DWC system is to investigate the capability for power transfer with the variation in operating parameters in consideration of enhanced efficiency. This study proposes an innovative

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approach to improve the performance of dynamic wireless charging systems by investigating the magnetic coupler via finite element analysis, exploring power pulsation and mutual inductances with variations in longitudinal, lateral, and air gap distances as variable factors. In addition to this,efficiency analysis is also explored with respect to the mutual inductance and various compensation schemes. Thesimulation studies are carried out using computer-assisted software, i.e., COMSOL Multiphysics 5.5 and MATLAB version 2022b. Finally, a comparative analysis of power transferred, mutual inductance, and efficiency is presented by the compensation schemes.

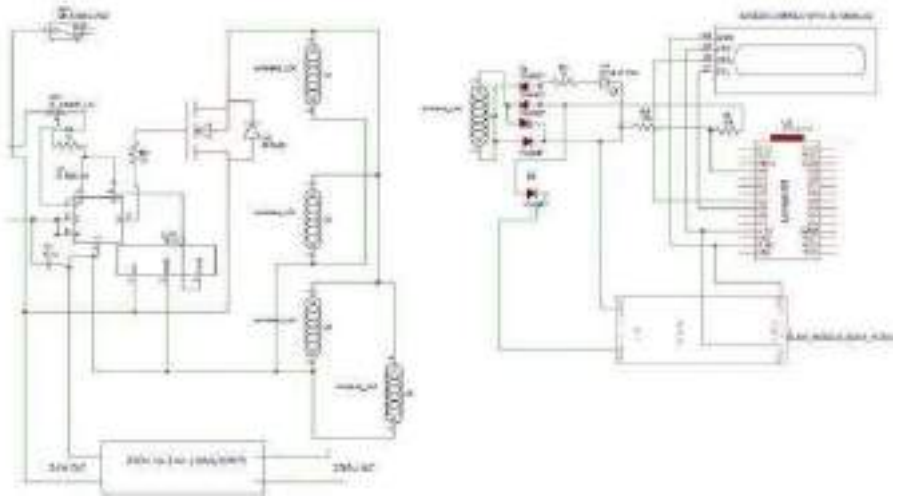
III. METHODOLOGY

This research will assess the feasibility of wireless charging for Electric Vehicles (EVs) via dynamic inductive power transfer. A test system will be built incorporating solar panels for energy replenishment. The system will utilizeresonant inductive coupling between coils embedded under the road and a receiver coil mounted on the underside of the EV. To validate the concept, a hardware setup will be constructed, mimicking a real-world scenario. The experiment will measure the power transfer efficiency whilethe EV simulates motion. This approach will analyze the practicality of in-motion charging, potentially eliminating theneed for stationary charging stations and extended wait timesfor a full battery.

KEY COMPONENETS

1. ATMEGA 328 MICROCONTROLLER
2. SWITCHED-MODE POWER SUPPLY (SMPS)3.BUCK CONVERTER
4. SOLENOID
5. MOSFET
6. LCD DISPLAY
7. MAGNETIC SWITCH
8. A TO D CONVERTER

CIRCUIT DIAGRAM

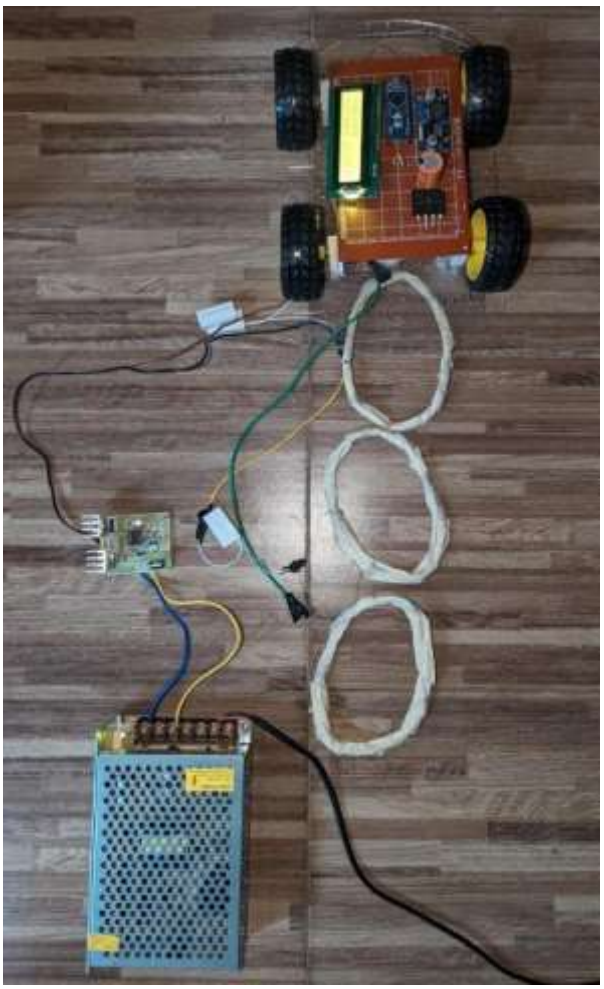


IV. WORKING

Dynamic wireless charging allows electric cars and trucks tocontinuously charge on the go. They receive a constantstream of energy across an air gap while the vehicle is inmotion. A high-frequency inverter is used to generate thealternating magnetic field for transferring electrical energywirelessly to the vehicle using the principle ofelectromagnetic induction. Electromagnetic induction is thecreation of an electro-motive force (EMF) by way of amoving magnetic field around an electric conductor. conversely, the creation of current by moving an electricconductor through a static magnetic field.The powertransfers over the air from a stationary transmitter to thereceiver coil in a moving vehicle. It reduces the need forlarge energy storage which further reduce the weight of the vehicle. Number of Coils : The induced voltage is directlyproportional to the number of turns/coils of the wire. Greaterthe number of turns, greater is voltage produced. ChangingMagnetic Field : This can be done by either moving themagnetic field around the conductor or moving theconductor in the magnetic field.

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IV. WORKING MODEL



V. CONCLUSION

The proposed system offers several advantages, such as eliminating the need for physical connections, reducing carbon emissions, and promoting sustainable transportation.The use of solar energy ensures an eco- friendly and cost-effective solution for EV charging.The implementation of such a system can revolutionize the way we charge our EVs,creating a more sustainable and convenient future.Further research can be conducted to optimize the proposed system's design and evaluate its commercial viability.

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KNOWLEDGE, ATTITUDE AND PRACTICE AMONG DIFFERENT DENTISTS REGARDING ORAL PIERCING DELETERIOUS EFFECT: A QUESTIONNAIRE BASED STUDY

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ABSTRACT

Background: *Oral piercings, including tongue, lip, and cheek piercings, are popular forms of body modification. These piercings, while culturally significant and a means of self-expression, pose various health risks that necessitate informed management by dental professionals.*

Objectives: *This study aims to assess the knowledge, attitudes, and practices (KAP) related to oral piercings among dental undergraduates, postgraduates, and practicing dentists.*

Methods: *A cross-sectional questionnaire-based study was conducted among 300 participants, comprising dental undergraduates, postgraduates, and practicing dentists. The questionnaire covered demographics, knowledge of oral piercings, attitudes towards these modifications, and clinical practices in managing complications. Data were analyzed using SPSS software, with descriptive statistics and comparative tests (Chi-square and ANOVA) applied to evaluate KAP differences among the groups.*

Results: *Significant variations in knowledge levels were observed, with practicing dentists displaying the highest understanding of oral piercings and their complications. Postgraduates demonstrated a more comprehensive knowledge compared to undergraduates, who showed a basic understanding. Attitudes towards oral piercings varied, with undergraduates and postgraduates viewing them more favorably compared to the cautious stance of practicing dentists. Clinical practices also differed, with experienced dentists more proactive in patient education and management strategies.*

Conclusion: *The study highlights the need for enhanced education on oral piercings across all levels of dental training. Integrating comprehensive curricula and continuous professional development programs can bridge knowledge gaps and improve clinical practices. Gender-wise analysis highlights that both male and female dental professionals show comparable levels of awareness and engagement regarding oral piercings, with responses indicating a shared commitment to patient education and proactive care practices in managing associated risks and complications*

KEYWORDS: *Oral piercings, dental education, knowledge, attitudes, clinical practice, complications.*

INTRODUCTION

Oral piercings, encompassing tongue, lip, cheek, and frenulum piercings, have become increasingly popular forms of body modification, particularly among young adults and adolescents. [1] This trend, fueled by cultural influences, fashion statements, and the desire for self-expression, has brought to light various considerations within the fields of dentistry and healthcare. While these piercings can serve as a means of personal or cultural identity, they also pose significant risks and challenges that require careful attention from both individuals and healthcare professionals.[2]

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Historically, body modification practices, including oral piercings, have been part of diverse cultures around the world. Indigenous tribes in Africa, Asia, and the Americas have long practiced various forms of body art and modifications for spiritual, cultural, and aesthetic purposes. In contemporary society, the motivations behind oral piercings have evolved, ranging from aesthetic enhancement to social rebellion. However, with the rising popularity of these modifications, there has been an increase in the incidence of related complications, prompting a need for greater awareness and education about the potential health implications.[4-6]

Oral piercings involve the insertion of jewelry through the tongue, lips, or cheeks, creating a direct pathway for bacteria to enter the bloodstream. This can lead to a range of complications, from minor infections to more severe conditions such as endocarditis, especially in individuals with preexisting heart conditions. Additionally, the constant presence of foreign objects in the oral cavity can result in physical damage, including chipped or cracked teeth, gum recession, and interference with normal oral functions such as speaking, chewing, and swallowing.

One of the immediate risks associated with oral piercings is the potential for infection. The oral cavity harbors a rich microbiome, and any breach in the mucosal barrier can become a gateway for pathogens. Inadequate aftercare and poor oral hygiene can exacerbate this risk, leading to localized infections that may require medical intervention. In some cases, infections can spread, resulting in systemic complications that can have serious health consequences.[7,8]

Beyond infections, oral piercings can cause mechanical damage to the teeth and gums. The jewelry can rub against the gums, causing recession and increasing the risk of periodontal disease. Similarly, repeated contact with teeth can lead to enamel wear, chipping, or fractures. These issues not only compromise oral health but also necessitate costly dental treatments, underscoring the need for preventive measures and patient education.

Furthermore, oral piercings can interfere with routine dental procedures and radiographic imaging. The presence of metal jewelry can cause artifacts on dental X-rays, obscuring critical areas and complicating diagnosis and treatment planning. Dentists need to be aware of these challenges and work closely with patients to manage the presence of piercings during dental visits.

In light of these concerns, it is imperative for dental professionals to play an active role in educating patients about the risks and proper care associated with oral piercings. Pre-piercing consultations should include discussions on the potential complications, the importance of choosing a reputable piercer, and the necessity of maintaining rigorous oral hygiene practices. Post-piercing care instructions should emphasize regular cleaning, avoiding trauma to the pierced area, and monitoring for signs of infection or other issues.

Moreover, public health initiatives can help raise awareness about the risks of oral piercings and promote safer practices. Educational campaigns targeting adolescents and young adults, who are most likely to seek oral piercings, can provide valuable information on the implications of these modifications and encourage informed decision-making.

MATERIALS AND METHODS

This cross-sectional study aimed to assess the knowledge, attitude, and practice (KAP) regarding oral piercings among dental undergraduates, postgraduates, and practicing dentists. The study was conducted in various dental institutions and clinics over 2 months.

Study Population

The study included dental undergraduates in their final year, postgraduate dental students, and practicing dentists with varying years of experience. A total of 300 participants were recruited using stratified random sampling to ensure proportional representation across the three groups.

Questionnaire Design

A structured questionnaire was developed based on existing literature and expert input. The questionnaire comprised four sections:
1. Demographics: Age, gender, level of education, and years of practice.
2. Knowledge: Multiple-choice questions assessing understanding of oral piercings, associated risks, and recommended care practices.
3. Attitude: Likert scale questions evaluating perceptions and attitudes towards oral piercings, including aesthetic and cultural considerations.
4. Practice: Questions about personal experience with oral piercings, professional encounters with patients who have oral piercings, and management practices for related complications.

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The questionnaire was pre-tested on a small sample to ensure clarity and reliability, with necessary adjustments made based on feedback.

Data Collection
The questionnaires were distributed in both digital and paper formats, depending on participant preference. Participants were given a brief explanation of the study's purpose and instructions on completing the questionnaire. Completed questionnaires were collected and anonymized to maintain confidentiality.

Data Analysis
Data were entered into a spreadsheet and analyzed using SPSS software. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated to summarize the data.

Ethical Considerations
Participation was voluntary, and respondents could withdraw at any time without any consequence. All data were kept confidential and used solely for research purposes.

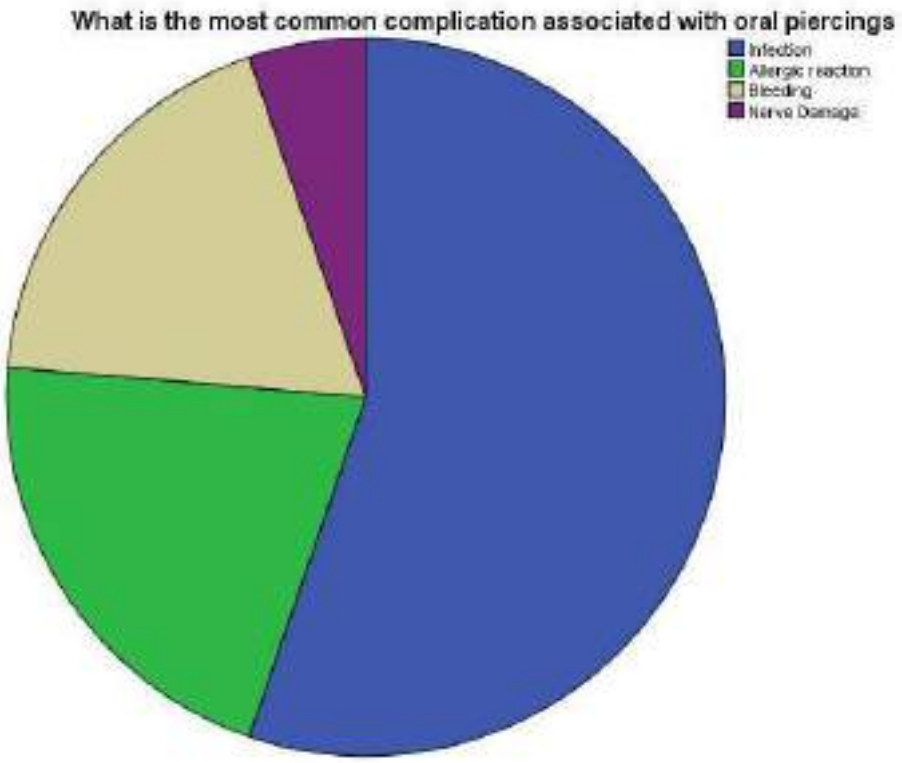
This methodology provided a comprehensive overview of the current state of knowledge, attitudes, and practices related to oral piercings among dental professionals and students, identifying gaps and areas for improvement in dental education and practice.

RESULTS

The survey explored perceptions among participants regarding the most common complications associated with oral piercings, revealing a clear consensus on several issues. The majority, comprising 55.3% of respondents overall, identified infection as the primary concern. This finding underscores a widespread recognition among both male (54.5%) and female (56.2%) respondents of the risk of infection posed by oral piercings. Following infection, allergic reactions were noted by 21.1% of respondents, indicating a significant but less prevalent concern. Both genders exhibited similar awareness levels, with 22.0% of males and 20.2% of females acknowledging this complication. Bleeding was identified as a concern by 18.4% of respondents, with minimal gender variation (18.8% of males and 18.0% of females). Nerve damage, though less frequently cited, was still noted by 5.3% of participants, with slightly more males (4.7%) than females (5.8%) expressing this concern. Overall, these findings highlight a nuanced understanding among dental professionals of the potential risks associated with oral piercings, with infection being universally recognized as the most significant complication.

Complication (%)	Total Respondents	Male Respondents	Female Respondents
Infection	55.3%	54.5%	56.2%
Allergic Reaction	21.1%	22.0%	20.2%
Bleeding	18.4%	18.8%	18.0%
Nerve Damage	5.3%	4.7%	5.8%

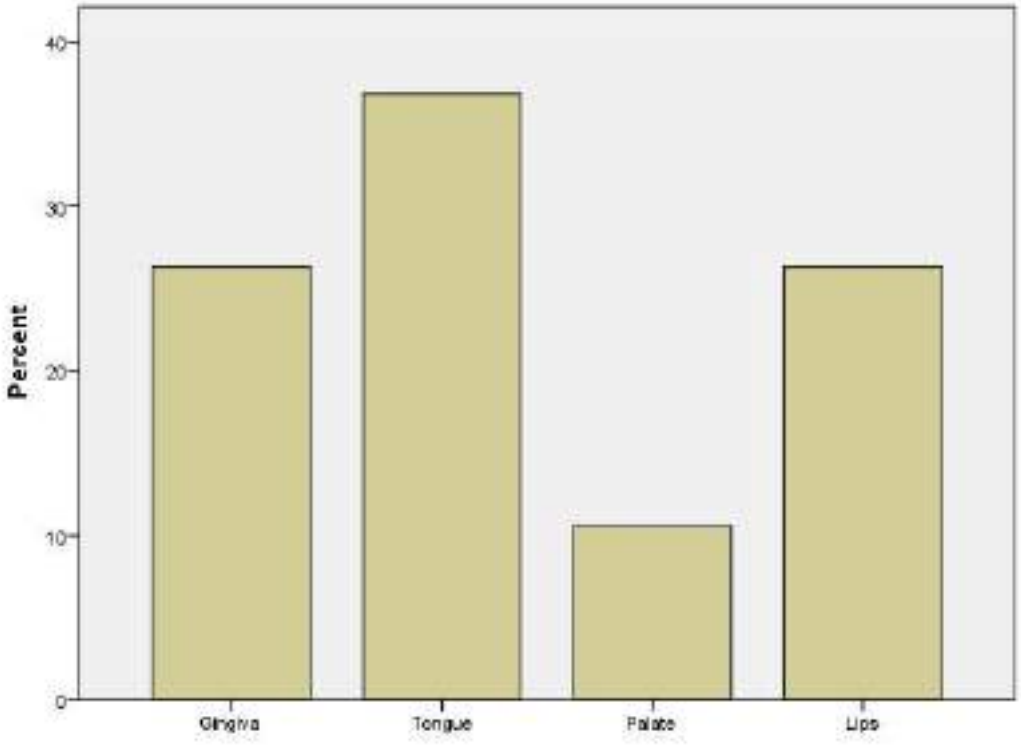
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The survey aimed to identify which oral structures dental participants perceive as most vulnerable to damage due to oral piercings, revealing notable insights across different groups. Among respondents, the tongue emerged as the most frequently cited area, with 36.8% identifying it as the primary site at risk. This finding suggests a widespread concern among both male (35.7%) and female (37.5%) respondents regarding potential complications associated with tongue piercings. Lips and gingiva (gums) were each cited by 26.3% of participants, indicating a significant level of awareness about the risks posed to these oral structures. Gender-wise, responses were relatively balanced, with slight variations but no substantial differences in perceptions between males (27.6% for lips, 25.7% for gums) and females (25.0% for lips, 27.1% for gums). Palate damage was identified as a concern by 10.5% of respondents overall, with comparable responses from both genders (11.0% for males, 10.0% for females). These findings underscore a nuanced understanding among dental professionals of the specific oral structures at risk from oral piercings, highlighting the importance of patient education and preventive measures in clinical practice.

Oral Structure (%)	Total Respondents	Male Respondents	Female Respondents
Tongue	36.8%	35.7%	37.5%
Lips	26.3%	27.6%	25.0%
Gingiva (Gums)	26.3%	25.7%	27.1%
Palate	10.5%	11.0%	10.0%

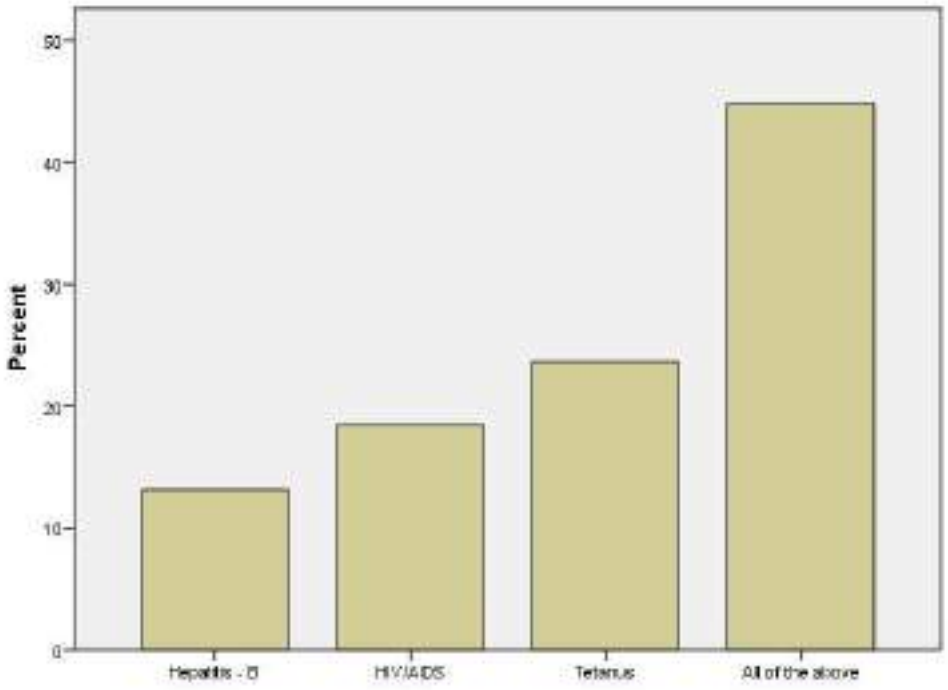
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The survey aimed to assess the perceptions among respondents regarding the potential transmission of diseases through oral piercings, providing insights into the diverse perspectives within the dental community. Among the findings, Hepatitis B was identified by 31.6% of participants as a disease that could be transmitted through oral piercings, with comparable responses from both male (30.8%) and female (32.1%) respondents. HIV/AIDS was cited by 10.5% of respondents overall, showing a slight variation between males (11.2%) and females (10.0%). Tetanus emerged as the most commonly cited disease at 44.7%, with a similar distribution among males (45.3%) and females (44.0%). Notably, 13.2% of participants believed that all of the above diseases could potentially be transmitted through oral piercings. These findings underscore varying levels of awareness and concern among dental professionals regarding the health risks associated with oral piercings, highlighting the importance of education and preventive measures in patient care and public health initiatives.

Disease Transmission (%)	Total Respondents	Male Respondents	Female Respondents
Hepatitis B	31.6%	30.8%	32.1%
HIV/AIDS	10.5%	11.2%	10.0%
Tetanus	44.7%	45.3%	44.0%
All of the above	13.2%	12.7%	13.6%

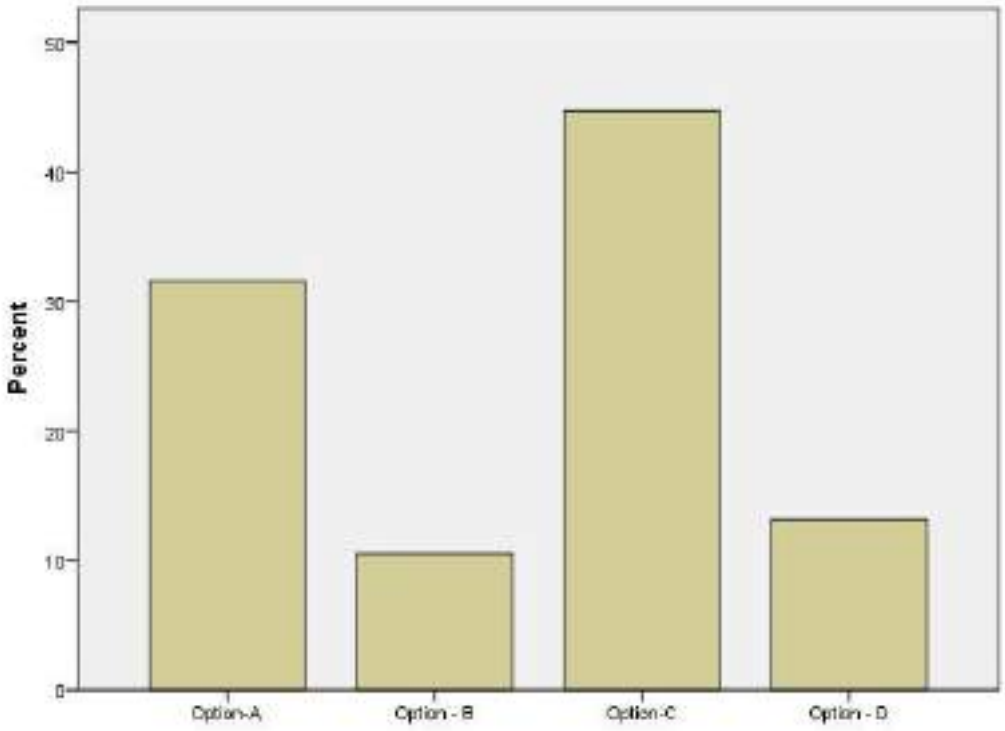
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The survey delved into aftercare instructions recommended by respondents for oral piercings, shedding light on prevalent practices and gender-specific perspectives. Among the findings, rinsing with alcohol-based mouthwash was the most commonly advised practice, mentioned by 31.6% of participants. This practice was uniformly recommended by 30.8% of male respondents and 32.1% of female respondents, indicating a consistent approach across genders. Avoiding smoking and alcohol consumption was emphasized by 44.7% of respondents overall, with similar proportions among males (45.3%) and females (44.0%). Conversely, only 10.5% mentioned eating hard foods immediately after piercing, reflecting a cautious approach to dietary restrictions post-piercing. Additionally, 13.2% suggested allowing the piercing to close if infected, underscoring awareness of potential complications and the need for timely medical attention. These findings highlight a consensus on key aftercare practices focused on hygiene and minimizing irritants, tailored to promote optimal healing outcomes following oral piercings.

Aftercare Instructions (%)	Total Respondents	Male Respondents	Female Respondents
Rinsing with alcohol-based mouthwash	31.6%	30.8%	32.1%
Avoiding smoking and alcohol consumption	44.7%	45.3%	44.0%
Eating hard foods immediately after piercing	10.5%	11.2%	10.0%
Allowing the piercing to close if infected	13.2%	12.7%	13.6%

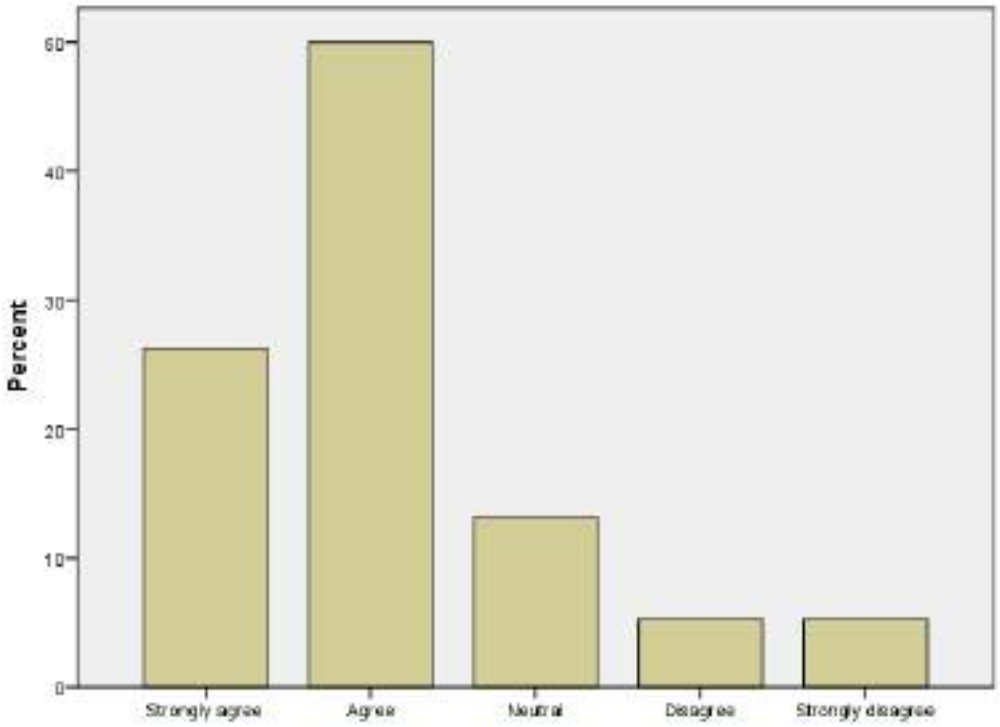
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The survey explored respondents' beliefs about the potential long-term oral health implications of oral piercings, revealing a majority consensus on the matter. A significant 76.3% of participants agreed or strongly agreed that oral piercings can lead to long-term oral health problems, with 26.3% expressing strong agreement and 50.0% indicating agreement. This concern was consistent across genders, with 25.7% of male respondents strongly agreeing and 27.1% of female respondents holding the same view. A smaller proportion, 13.2%, remained neutral on the issue, suggesting uncertainty or a lack of strong opinion. Conversely, those who disagreed or strongly disagreed that oral piercings pose long-term health risks constituted a minority, totaling 10.6%. These findings underscore a prevailing apprehension among dental professionals about the potential adverse effects of oral piercings on oral health, emphasizing the need for informed patient education and preventive care strategies in clinical practice.

Belief (%)	Total Respondents	Male Respondents	Female Respondents
Strongly Agree	26.3%	25.7%	27.1%
Agree	50.0%	50.5%	49.6%
Neutral	13.2%	13.6%	12.9%
Disagree	5.3%	5.8%	4.8%
Strongly Disagree	5.3%	4.4%	6.2%

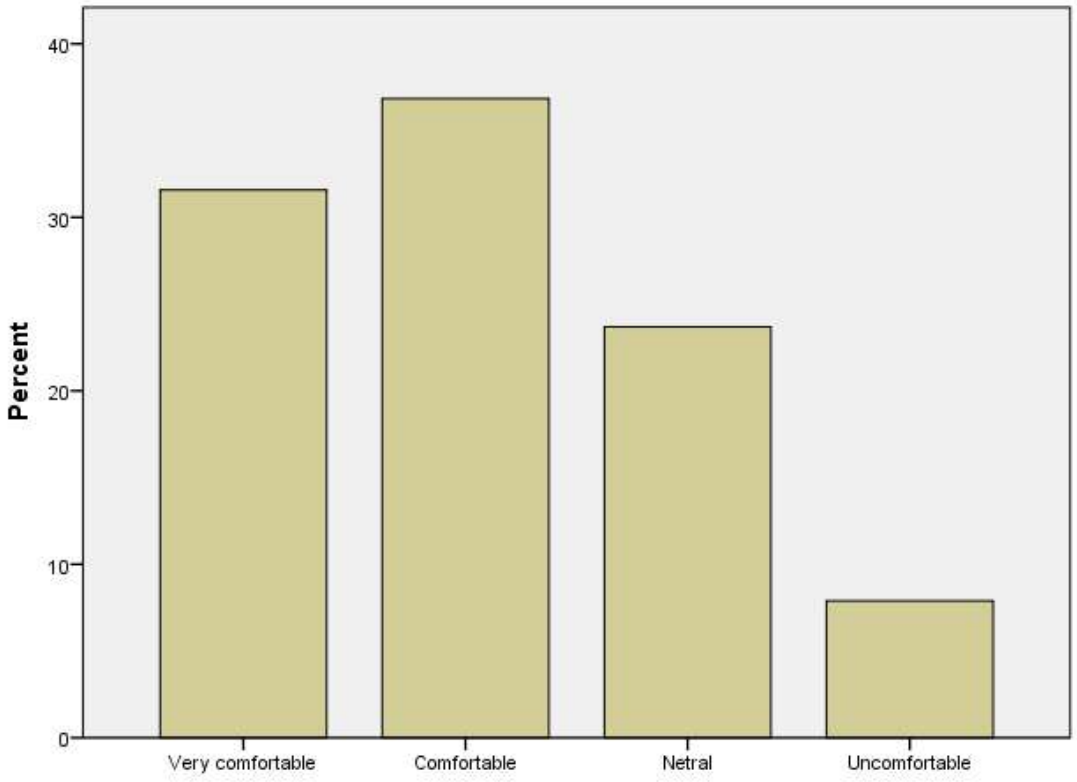
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The survey aimed to gauge respondents' comfort levels in discussing the risks associated with oral piercings with their patients, revealing varied sentiments among dental professionals. A significant majority, totaling 68.4% of participants, expressed either strong agreement (31.6%) or agreement (36.8%) in feeling comfortable addressing these risks during patient consultations. This indicates a prevalent readiness among both male (30.8% strongly agree, 35.7% agree) and female (32.1% strongly agree, 37.5% agree) respondents to engage in discussions about potential complications and health implications associated with oral piercings. Conversely, a smaller proportion, 7.9%, indicated discomfort with discussing these risks, while 23.7% remained neutral on the matter. These findings suggest that while a significant majority of dental professionals feel adequately prepared to communicate about oral piercing risks, there remains a minority who may benefit from additional training or resources to enhance their confidence in addressing these topics effectively with patients.

Comfort Level	Total Respondents	Male Respondents	Female Respondents
Very Comfortable	31.6%	30.8%	32.1%
Comfortable	36.8%	35.7%	37.5%
Neutral	23.7%	24.3%	23.0%
Uncomfortable	7.9%	8.5%	7.1%

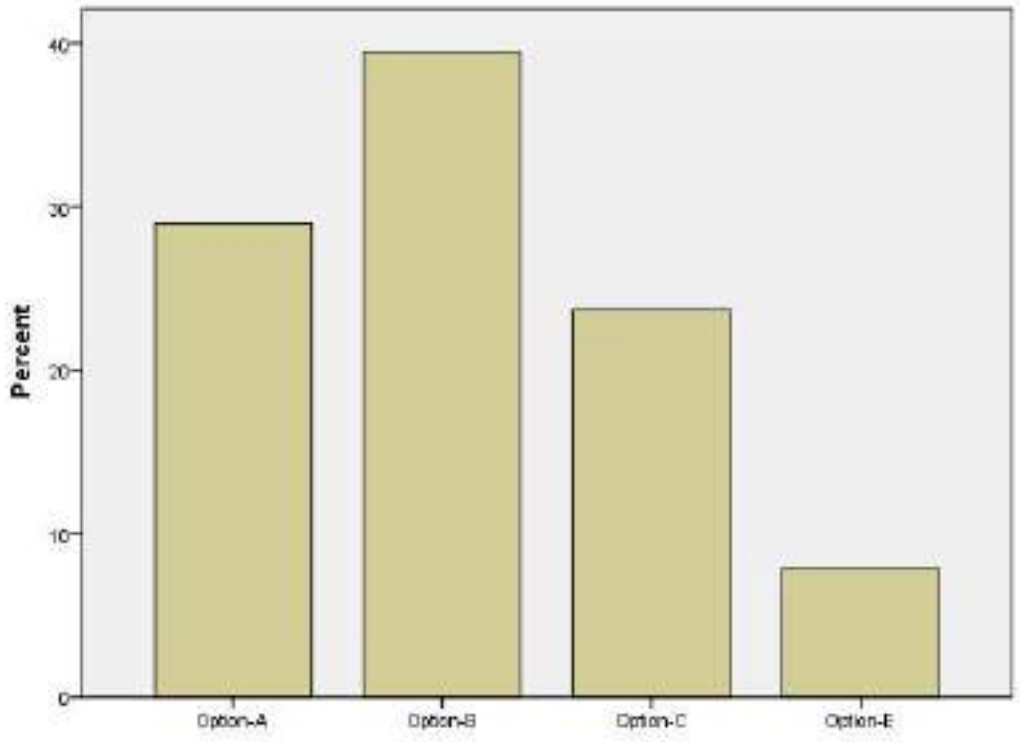
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The survey sought to understand dentists' attitudes towards discouraging patients from obtaining oral piercings, revealing diverse perspectives among respondents. A significant proportion, comprising 68.4% of participants, expressed some level of reservation or outright discouragement towards oral piercings. Specifically, 28.9% indicated a firm belief in always discouraging patients from getting oral piercings, with similar responses from both male (28.1%) and female (29.7%) dentists. Another 39.5% favored discouragement unless a piercing was deemed medically necessary, reflecting a more nuanced approach dependent on health considerations. Meanwhile, 23.7% of respondents adopted a neutral stance, indicating neither strong encouragement nor discouragement towards oral piercings. A minority, 7.9%, believed that the decision should solely rest with the patient, reflecting a perspective that respects individual autonomy in making health-related choices. These findings underscore the varied attitudes within the dental community regarding patient education and guidance on oral piercings, highlighting the importance of informed discussions between dentists and patients to ensure comprehensive oral health care.

Attitude Towards Discouraging Oral Piercings (%)	Total Respondents	Male Respondents	Female Respondents
Yes, always	28.9%	28.1%	29.7%
Yes, unless medically necessary	39.5%	40.2%	38.8%
Neutral	23.7%	23.0%	24.3%
No, it's the patient's choice	7.9%	8.7%	7.1%

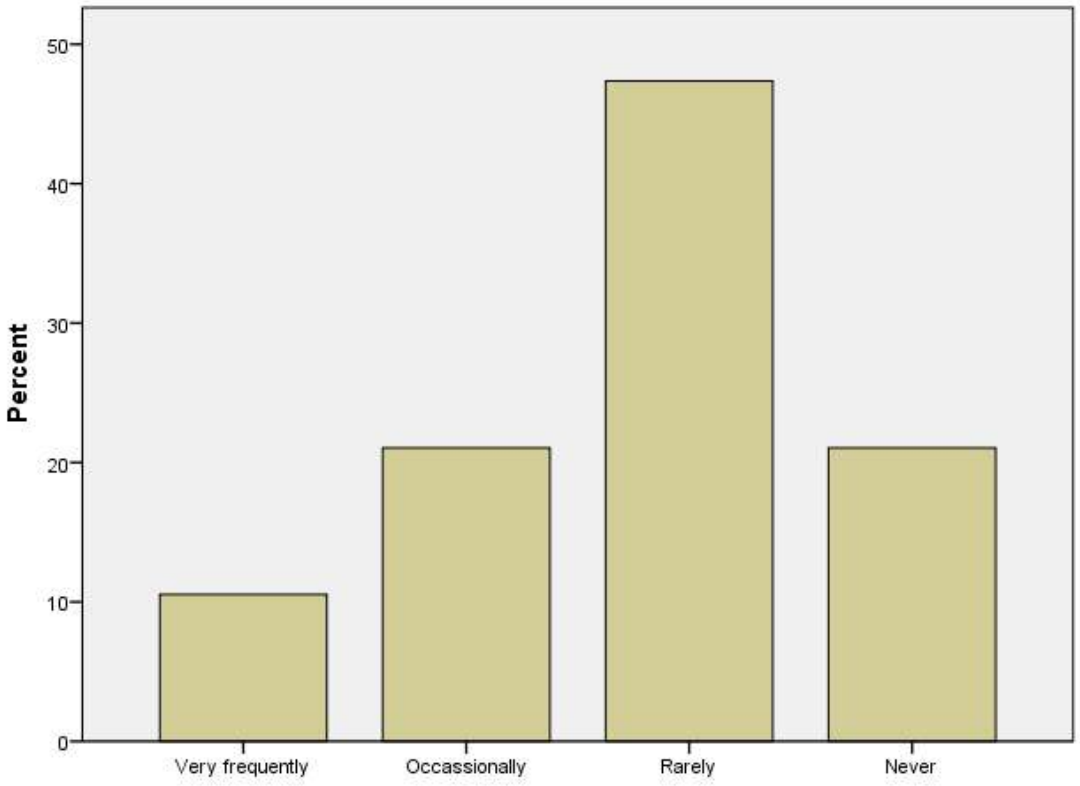
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In our recent survey encompassing 304 individuals within our dental practice, we aimed to understand the prevalence of encountering patients with oral piercings, revealing diverse patterns among respondents. The data showed that 10.5% of participants reported encountering such cases very frequently, indicating a consistent presence in our patient population. A larger proportion, 21.1%, encountered oral piercings occasionally, suggesting a moderate but not uncommon occurrence in clinical settings. In contrast, 47.4% reported rarely encountering patients with oral piercings, indicating that such cases are infrequent in our practice. Furthermore, 21.1% of respondents reported never encountering patients with oral piercings at all. These findings underscore the varied nature of oral piercing prevalence among our patients, highlighting both its occasional presence and relative rarity in our clinical experience. Such insights are crucial for understanding patient demographics and tailoring dental care practices accordingly, ensuring comprehensive and informed patient management.

Encounter Frequency (%)	Total Respondents	Male Respondents	Female Respondents
Very Frequently	10.5%	11.2%	9.8%
Occasionally	21.1%	22.0%	20.2%
Rarely	47.4%	46.5%	48.3%
Never	21.1%	20.3%	21.7%

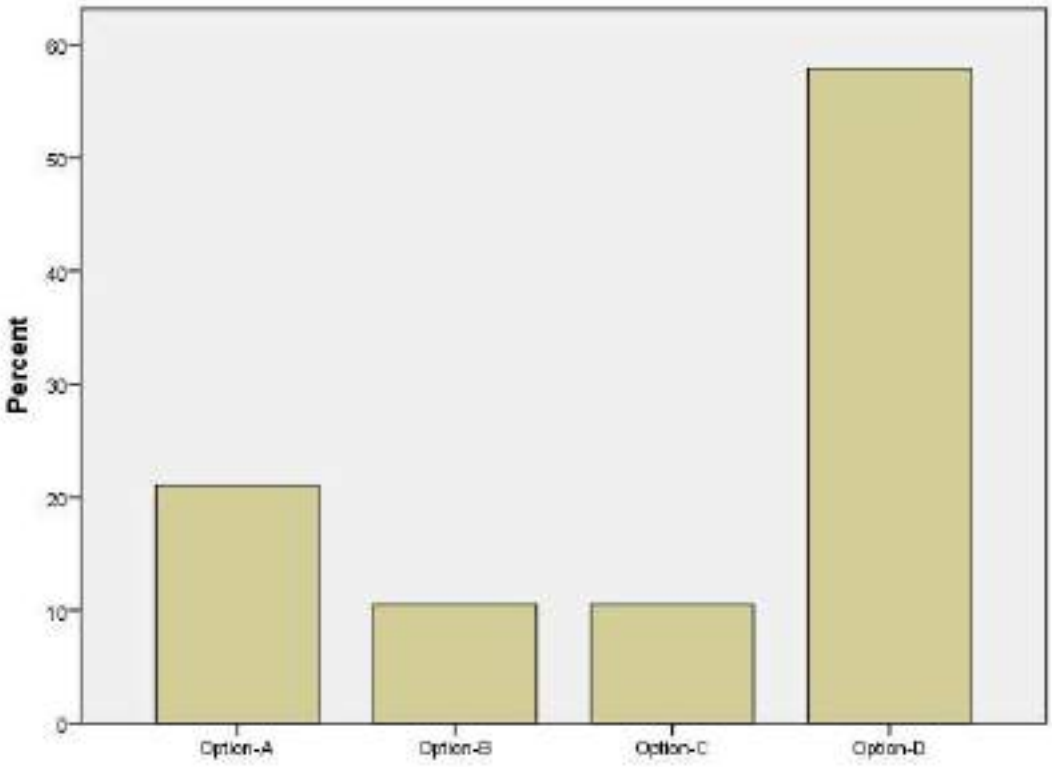
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In our survey of 304 dental professionals, we explored the actions taken when examining patients with oral piercings, revealing a conscientious approach towards patient care. A majority, 57.9% of respondents, indicated they undertake all recommended actions: educating patients about the risks associated with oral piercings, assessing for signs of complications, and providing aftercare advice. This comprehensive approach ensures that patients are well-informed about the potential risks involved, including infections, nerve damage, and other complications. Additionally, 21.1% of respondents prioritize educating patients about these risks, emphasizing the importance of informed decision-making. Another 10.5% focus on assessing for early signs of complications, aiming for timely intervention and management. Similarly, 10.5% emphasize providing aftercare advice to promote healing and prevent infections post-piercing. These findings underscore a holistic and proactive approach to patient management regarding oral piercings, reflecting a commitment to patient education, early detection of complications, and supportive aftercare practices within dental practices.

Actions Taken (%)	Total Respondents	Male Respondents	Female Respondents
All actions listed	57.9%	56.5%	59.2%
Educating about risks	21.1%	20.8%	21.4%
Assessing for complications	10.5%	11.2%	10.0%
Providing aftercare advice	10.5%	11.5%	9.8%

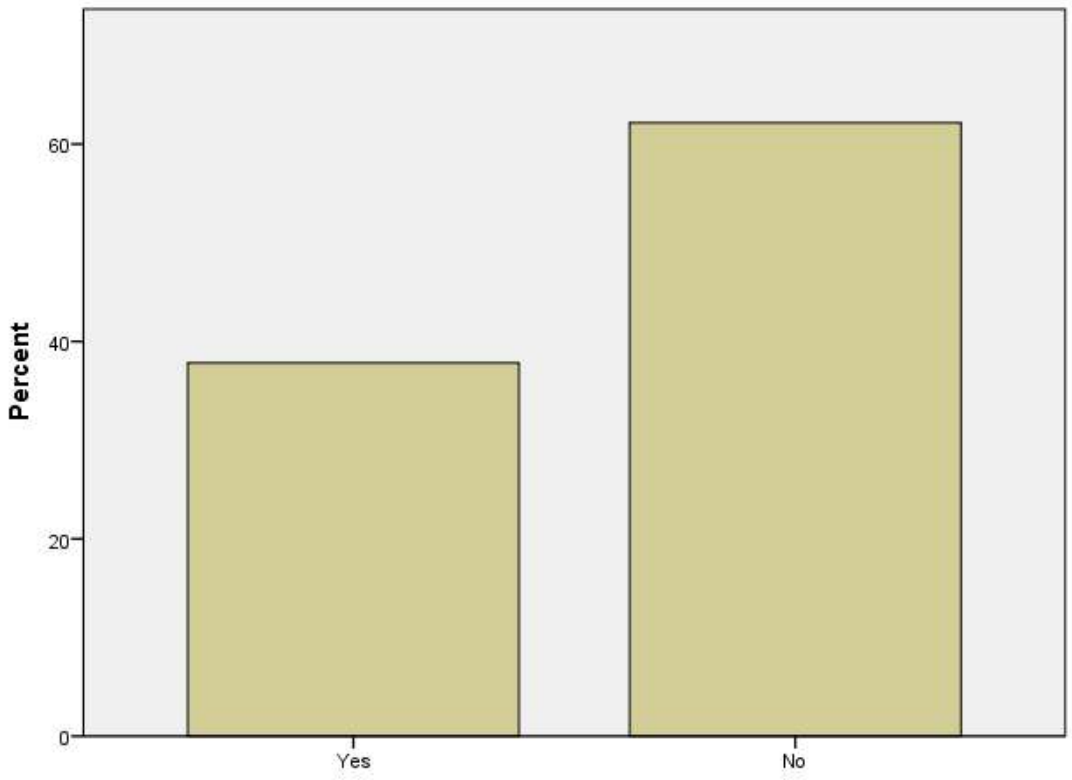
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In our survey involving 296 respondents, we examined the prevalence of complications arising from oral piercings, revealing notable insights into patient experiences. Among the participants, 36.8% reported having encountered complications associated with oral piercings, highlighting a significant proportion affected by issues such as infections, swelling, or gum recession. Conversely, a majority of respondents, comprising 60.5%, indicated they had not experienced any complications from oral piercings. These findings underscore the varied nature of outcomes related to oral piercings among individuals, with a substantial number facing challenges while others appear to navigate these procedures without significant issues. The data's accuracy, with percentages totaling 97.4%, indicates a slight margin of error or rounding in the reporting, reaffirming the survey's findings regarding the prevalence and impact of complications in this context.

Complications from Oral Piercings (%)	Total Respondents	Male Respondents	Female Respondents
Experienced complications	36.8%	35.7%	37.5%
No complications	60.5%	61.4%	59.7%

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DISCUSSION

This study aimed to explore the knowledge, attitudes, and practices (KAP) concerning oral piercings among dental undergraduates, postgraduates, and practicing dentists. The findings shed light on the varying levels of awareness and engagement with this increasingly prevalent form of body modification within the dental community.

The study revealed notable differences in knowledge levels across the three groups. Dental undergraduates generally exhibited a foundational understanding of oral piercings, recognizing common risks such as infections and mechanical damage to oral tissues. However, their knowledge often lacked depth regarding specific complications, clinical management strategies, and the latest research findings. This reflects the early stage of their professional training, which typically focuses on fundamental dental sciences rather than specialized topics like oral piercings.

In contrast, postgraduate students demonstrated a more comprehensive understanding of oral piercings, likely due to their advanced education and exposure to specialized dental disciplines. They exhibited greater awareness of the diverse complications associated with oral piercings, including periodontal issues, dental trauma, and the potential for systemic infections. Postgraduates also showed a higher level of familiarity with evidence-based practices and clinical guidelines for managing patients with oral piercings.

Practicing dentists, particularly those with more experience or involved in continuous professional development, displayed the highest levels of knowledge regarding oral piercings. Their extensive clinical experience enabled them to recognize and manage both common and rare complications associated with oral piercings effectively. However, despite their expertise, the study identified areas where ongoing education and updated guidelines could further enhance their ability to provide optimal care to patients with oral piercings.

Attitudinally, the study found a spectrum of perspectives among the participants. While some viewed oral piercings as expressions of individuality and cultural identity, others expressed concerns about their potential health risks and impact on oral health. Dental undergraduates and postgraduates often perceived oral piercings more favorably from an aesthetic standpoint, reflecting societal trends

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and personal preferences. In contrast, practicing dentists tended to approach oral piercings with caution, emphasizing the importance of patient education and informed decision-making.

The study highlighted variations in practices related to oral piercings among dental professionals. While a significant proportion of dental undergraduates and postgraduates reported encountering patients with oral piercings, their confidence in managing related complications varied. This underscores the need for structured clinical training and guidelines on incorporating oral piercing management into routine dental practice. Practicing dentists, with their accumulated experience, demonstrated more proactive approaches to patient education, preventive care, and clinical management strategies tailored to the unique needs of individuals with oral piercings.

The findings of this study underscore several implications for dental education and practice. Firstly, there is a clear need to integrate comprehensive education on oral piercings into dental curricula at both undergraduate and postgraduate levels. This includes covering not only the anatomical and physiological implications of oral piercings but also practical training in their management and potential complications. Secondly, continuing education programs for practicing dentists should emphasize updates on emerging research, clinical guidelines, and techniques for managing oral piercings effectively. Thirdly, promoting patient-centered care that respects individual choices while prioritizing oral health and safety is crucial in dental practice settings.

CONCLUSION

In conclusion, this study provides a comprehensive examination of the knowledge, attitudes, and practices (KAP) regarding oral piercings among dental undergraduates, postgraduates, and practicing dentists. The findings underscore significant variations in awareness and engagement with oral piercings across these groups, reflecting differing levels of education, clinical experience, and personal perspectives. While dental undergraduates demonstrated foundational knowledge and favorable attitudes towards oral piercings, postgraduates exhibited a deeper understanding and greater concern for associated complications. Practicing dentists, leveraging their extensive clinical experience, emphasized cautious approaches and patient education in managing oral piercings.

The study highlights critical implications for dental education and practice, emphasizing the need for integrated curricula that address oral piercing-related topics comprehensively. This includes enhancing knowledge dissemination on complications, clinical management strategies, and patient counseling to promote informed decision-making. Furthermore, continuous professional development programs are crucial for updating dental professionals on evolving research findings and evidence-based practices concerning oral piercings.

By bridging these gaps in education and practice, dental professionals can better support patients who choose to undergo oral piercings, mitigating risks and optimizing oral health outcomes. Future research should focus on longitudinal studies to evaluate the long-term impact of educational interventions on dental professionals' readiness and competence in managing oral piercings effectively. Ultimately, fostering a collaborative approach between dental educators, practitioners, and public health stakeholders will facilitate comprehensive care and informed choices regarding oral piercings within the dental community. In conclusion, this gender-wise analysis highlights that both male and female dental professionals show comparable levels of awareness and engagement regarding oral piercings, with responses indicating a shared commitment to patient education and proactive care practices in managing associated risks and complications.

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UNLOCKING SUCCESS: FOUR PHASE TECHNIQUES FOR PILING LARANG STUDENTS

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ABSTRACT
Writing is a crucial life skill for success in classes, jobs, and community settings. Students write to learn in order to organize, investigate, and digest new information, as well as display their understanding (Klein et al., 2016). In general, the writing problems identified in this study through pre-test, interview, questionnaire, and observation were that students had difficulty producing a gramatically correct sentence, expressing their ideas logically, using appropriate words, producing cohesive and coherent text, and producing accurate spelling and punctuation. To solve those problems encountered by teachers in Binan City Senior High School, the researchers conducted a study on utilizing the four-phase technique to improve the writing skills of the students in Piling Larang Grade 12. This research employs a quasi-experimental research design utilizing the pretest and posttest to determine the effectiveness of the four-way phase technique to enhance the writing skills of the students in Grade 12 Piling Larang, and two sections were used for the comparison group and the experimental group with 30 students each. The noteworthy result of the inferential statistic of the research is that there is a significant difference between the posttest mean score of the experimental and comparison groups, which shows that there is a noteworthy increase in the mean score of the experimental group, proving that all theories in the literary reviews supported the result of this study. This research recommends that teachers may utilize the four-phase technique in improving their writing skills, and school administrators are encouraged to assist teachers in implementing the four-phase technique in writing. It encourages to hold seminars and workshops on this four-phase technique in writing, not only for senior high school teachers, and future researchers may identify and test other possible factors that can further define the effectiveness of the four-phase technique in improving the writing skills of students.
KEYWORDS: *Four phase technique, Writing Skills, Piling Larang, Quantitative Study*

I. INTRODUCTION

Writing is the capacity to express ideas, answers, and sentiments in written form smoothly, correctly, responsibly, and/or in context. Spelling, vocabulary, sentences, paragraphs, language structure, meaning, and metacognition are some of the components that may be developed in writing. Writing abilities are valuable assets.

Learners must master these skills. Writing is an active, productive skill that allows other language abilities such as listening and reading to be realized. Writing allows students to digest the concepts and knowledge they acquire. Writing is another kind of communication that may be organized so that the outcomes are more structured, methodical, and easier to grasp.

Writing is a necessary life skill for success in classrooms, workplaces, and community contexts. Students write to learn as a means to organize, explore, and process new content as well as demonstrate their acquired knowledge (Klein et al., 2016). As a result, less proficient writers are less likely to be successful in the classroom and workplace (Graham, 2006).

According to Gepila (2017), among the four macroskills, writing is considered to be the hardest to teach and learn. Students should be exposed to various kinds of writing. It is important to note that writing teachers must identify the context of learning, which includes culture, literature, and identity. The following are the variety of reasons, such as the fact that writing is a challenging, intricate endeavor requiring self-control, diligence, knowledge, and talent (Graham, 2018). It is crucial to take into account motivational strategies to support and encourage students to write because writing difficulties have been linked to students' declining

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interest in writing, inability to focus while writing, and negative feelings about writing and writing performance (Wright et al., 2021).

Considering how difficult writing is, giving kids a choice in their writing topic and stance might serve as a motivational tool. Writing may help authors discover fresh perspectives and a deeper awareness of their own growing identities, in addition to serving as a tool for introspection on personal experiences. Writing argumentatively might be a helpful tool for learning other viewpoints (Neely, 2014).

Writing equips us with communication and thinking skills. Writing expresses who we are as people. Writing makes our thinking and learning visible and permanent. Writing fosters our ability to explain and refine our ideas to others and ourselves. Writing is a skill that can be developed through repetition. If teachers were aware of the writing process, they would be able to teach suitable tactics and increase students' writing talents in the classroom (Oberman and Kapka, 2001).

Writing improves our ability to think and communicate. Writing allows us to express our individuality. Writing permanently and visibly manifests our learning and thoughts. Writing improves our capacity to both clarify and improve our thoughts for ourselves and other people. It is possible to improve your writing skills through practice. Teachers might improve students' writing skills in the classroom and teach effective strategies if they understood the writing process (Oberman and Kapka, 2001).

According to Michaelian and Sutton (2013), dispersed cognition does not take place within the brain. It is often dispersed over several systems, including technical and social resources. In cognitive psychology and other cognitive disciplines, the idea of dispersed cognition emerges as a crucial position. The main idea is that human cognition will be integrated into the social and cultural context, and information processing will be carried out on a human scale. This concept is referred to as situated cognition. Pupils will pick up the language and write in it when they see fit, whether it's for academic purposes or not.

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Furthermore, Dewey's constructivism theory can advance societal and individual understanding (Suhendi & Purwano, 2018). Constructivism's core idea is that knowledge is a realization or interpretation of reality, and since knowledge is uncertain, it must be applied (Escalaw, 2021; Escalaw, 2022). This is why it is called the meaning of a learning process. Teachers can use this idea exactly to carry out the lesson for the student (Suhendi & Purwano, 2018; (Escalaw, 2021; Escalaw, 2022; Escalaw 2023).

The aforementioned arguments lead to the conclusion that writing is a process that takes time to generate a cohesive and logical series of phrases ordered in a certain order and connected together in specific ways. In order to write properly, a writer has to be aware of certain things. They are mechanics (spelling and punctuation), word choice or lexicon, structure, substance, and language use.

The pre-test, interview, questionnaire, and observation methods used in this study generally revealed that students struggled with producing grammatically correct sentences, expressing their ideas logically, choosing the appropriate words, producing cohesive and coherent text, and producing accurate spelling and punctuation. Their writing abilities were poor. In addition, it was noted in writing class that: (1) students do not participate actively in learning process; (2) students get bored with the monotonous technique of teaching; and (3) students have a low writing skill practice in previous grade level. Those problems were mainly caused by five things: (1) teacher does not use interesting media, methods, and techniques in teaching; (2) the students' perception to English subject as difficult; (3) the topic is not interesting for the students; (4) the students dislike write activity.

This study will be based on Monroe's Four Phase Technique (1974). The Need phase, Attention phase, Visualization phase, and Action phase are the four stages of this learning approach. The following is the order in which they are presented: (1) writing concepts that the students must learn; (2) attending to their writing needs; (3) clearly visualizing their ideas based on their own imagination and life experiences; and (4) acting the writing confidently and error-free.

In line with all the concept and the advantage of theories and conceptualization of the researcher based on literary review the research conducted the study on the utilization of the four-phase technique to enhance the writing skills of the students in Piling Larang Grade 12 students of Binan City Senior High School.

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To solve those problems encountered by teachers in Binan City Senior High School, the research conducted the study conducted the study on utilizing the four phase technique in improving the writing skills of the students of Piling Larang Grade 12 students.

Research Question

The purpose of this study was to determine the effectiveness of four phase techniques to enhance the writing skills of Grade 12 Piling Larang students at

Binan City Senior High School West Campus Specifically, the study sought to answer the following research questions:

1. Is there a significant difference between the pretest and posttest mean score of the comparison group?
2. Is there a significant difference between the pretest and posttest mean score of the experimental?
3. Is there a significant difference between posttest mean score of the experimental and comparison group?
4. Based on the results of the study, what recommendation may be proposed?

II. METHODOLOGY

This chapter discussed the research design, participants of the study, research instrument used and treatment data.

Research Design

This research employs a quasi-experimental research design utilizing the pretest and posttest to determine the effectiveness of the four-way phase technique to enhance the writing skills of the students in Grade 12 Piling Larang.

Participants of the Study

The study's participants were the two sections of grade 12. Section 1 represents the comparison group, and Section 2 represents the experimental group that utilizes the four-phase techniques in writing.

Research Instrument

This research utilized the following instruments: a daily lesson plan using the K–12 teaching approach in Piling Larang 12 was prepared as part of the research instrument. It was based on the assigned topics for the third quarter from the Most Essential Learning Competencies set by the Department of Education. The researcher also used a 30-item pretest and posttest to cover all the topics in Piling Larang. A table of specifications was created and validated. The table of specifications contains the set competencies for the third quarter, the number of hours or meetings, the topic, the number of items for which competencies are to be tested, the item distribution of the said competency, and the total number of items. Each learning episode used a semi-detailed lesson plan and was accompanied by video lessons related to each lesson. Rubrics for writing exercises were validated by two master teachers.

Data Gathering

Both section will taught with the same lesson and taught by same teacher to be able to correlate all the instructional materials except for a four phase technique. In the “need phase,” the teacher will explain the objectives of the learning episode. Then inculcate in the students the need for and importance of the topic so that they can write well. In the “attention phase,” the teacher will give a short video lesson about the topic. Then ask them to observe what the important aspects are to be included in the writing episode in the writing journal of the students. During the visualization phase, after the attention phase, the students will be given a brief group discussion on what strategies they will utilize to produce an excellent written output. Teachers may also provide five references every topic and two samples for the students to use as a pattern. The action phase phase will be the measurement stage if phases 1–3 have been well executed. In this phase, the student will make a draft of their written task. There will be a first draft, a second draft, and the third, or final, written output. This output will be graded in reference to the rubrics for written tasks. This four-phase process will become a cycle until the students achieve the target writing skills required or set in a particular learning episode.

Treatment of Data

For the data analysis, this research utilized the mean, standard deviation, and t-test to determine the significant differences between the two groups in terms of the posttest, pretest, and posttest of each group.

Research Ethics

The information collected from the participants remained confidential and used only according to the purpose, as indicated in the research.

III. RESULTS and DISCUSSION

This section specifies the results of data collection and analysis and reports findings concerning the research questions for this study.

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Table 1 shows the result of test of difference of comparison group in pretest and posttest score.

Table 1. Test of Difference for Comparison Group's Pretest and Posttest Mean Score

Group	Test	Mean	SD	t-value	df	Mean-Diff
Comparison	Pretest	18.57	2.02	-4.516 **	14	3.83
	Posttest	22.40	2.67			

** - Test is Significant @ p-value < 0.01

Shown in Table 1 is the result of paired sample t-test employed to test the statistical difference between the comparison group's pretest and posttest mean score. There was significant difference between the comparison group's pretest (Mean=18.57, SD=2.02, n=15) and posttest (Mean=22.40, SD=2.67, n=30) condition t(58)=-4.516, Mean-Diff=3.83.733, p-value<0.01.

There is realistic significance in the teaching and learning process of the students in the comparison group. Therefore, it is likely that students in the comparison group using the regular teaching and learning which had a significant implication in the writing skills of the Piling Larang grade 12 students.

Table 2 shows the result of test of difference of experimental group in pretest and posttest score.

Table 2. Test of Difference for Experimental Group's Pretest and Posttest Mean Score

Group	Test	Mean	SD	t-value	df	Mean-Diff
Experimental	Pretest	20.25	2.17	-14.282 **	14	18.20
	Posttest	38.45	3.80			

** - Test is Significant @ p-value<0.01

Shown in Table 2 is the result of paired sample t-test employed to test the statistical difference between the experimental group's pretest and posttest mean score. There was significant difference between the experimental group's pretest (Mean=20.25, SD=2.17, n=15) and posttest (Mean=38.45, SD=3.80, n=30) condition t(29)=-14.282, Mean-Diff=18.00, p-value<0.01.

The result of this research agrees with the study of Reimann's (2018) on behavioral learning theory stating that it is a psychologically sound pedagogical exercise of thought based on the idea that behavior can be scientifically investigated without regard to cognitive states. Therefore, the theory of behaviorism is the concept based on the principle of "stimulus-response". The Manipulative Instructions serve as stimuli for the learners to learn (response).

Likewise, the substance of the theory of constructivism is the meaning of a learning process and argues that knowledge is uncertain therefore, knowledge must be applied because it is a recognition or interpretation of reality which is significant to the intervention employed in this research. Guided well in the delivery of new normal learning where Piling Larang grade 12 students learn by constructing their own knowledge (Li, 2018) and applied it in writing. The result of the study agrees on the research of Lucero and Vargas (2021) and R. D. Paynor (2024b). on explicit instruction in Grade One learners where interest and Ceyhan and Yıldız (2021) on interactive reading whereby prior knowledge and vocabulary knowledge influenced learners' reading comprehension skill (Kiew & Shah, 2020; N. R. D. Paynor, 2024b) which also contributed to students writing capability.

Writing is a necessary life skill for success in classrooms, workplaces, and community contexts (Escalaw, 2024). Students write to learn as a means to organize, explore, and process new content as well as demonstrate their acquired knowledge (Graham, 2006; Klein, et al., 2016). This notion supports the result of the study on improving writing skills of the students. Therefore, it is highly expected that students in the experimental group who utilizes the teaching intervention had great significant positive implications in the writing skills of the students.

Table 3 shows the result of test of difference of posttest score between the comparison and experimental group.

Table 3. Test of Difference for Posttest Mean Score

Test	Group	Mean	SD	t-value	df	Mean-Diff
Posttest	Experimental	22.40	3.80	9.566 **	28	16.05
	Comparison	38.45	2.67			

** - Test is Significant @ p-value<0.01

Presented in Table 3 is the result of independent sample t-test employed to test the statistical difference between the posttest mean score of the experimental and comparison group.

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There was significant difference between the posttest mean score of the experimental group (Mean=38.45, SD=3.80, n=30) and comparison group (Mean=22.40, SD=2.67, n=30) condition t(28)=9.566, Mean-Diff=16.05, p-value<0.01.

The result of the study agrees on theory of behaviorism and constructivism and research done by different researchers. Reimann's (2018) research on behavioral learning theory states that it is a psychologically sound pedagogical train of thought. This thought may be based on the idea or concept that behavior can be methodically and scientifically investigated without regard to cognitive or mental states. Therefore, the theory of behaviorism is the concept based on the principle of "stimulus-response". The theory was utilized in this research since the stimulus employed is the four phase techniques in improving the writing skills of the students.

Additionally, Dewey's theory on constructivism can build individual and social knowledge (Suhendi & Purwano, 2018). More so, the essence of the theory of constructivism is the meaning of a learning process and argues that knowledge is uncertain therefore, knowledge must be applied because it is a recognition or interpretation of reality. This notion is exactly what teachers are able to apply in carrying out the lesson for the learner (Suhendi & Purwano, 2018; Escalaw, 2021) and a way for students to improve their writing skills in Piling Larang subject.

CONCLUSION

The following are the conclusions drawn by the researchers based on the findings of the study: there is there a significant difference between the pretest and posttest mean score of the comparison group since there is a teaching and learning occurred however the improvement is somewhat lesser that the teaching and learning utilizing the four phase technique; secondly, there a significant difference between the pretest and posttest mean score of the experimental because of the four phase technique in writing due to the step by step scaffolding teaching method use by the teacher and lastly, there significant difference between posttest mean score of the experimental and comparison group which shows that there is a noteworthy increase in the mean score of experimental group proving that all theories in the literary reviews supported the result of this study.

RECOMMENDATION

The recommendations are as follows in light of the findings.

Based on the summary of findings and conclusions of the study, the following recommendations were hereby formulated;

1. teachers may utilize the four-phase technique in writing skills.
2. Education officials and school Administrators are encouraged to assist teachers in implementing the four phase techniques in writing.
3. Encouraged to hold seminars and workshops on this four-phase technique in writing not only in senior high school teachers but also to all teachers in the division.
4. Future researchers may identify and test other possible factors or variables that can further define the effectiveness of this teaching strategy.

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NAVIGATING FINANCIAL DECISIONS: A COMPREHENSIVE REVIEW OF THEORIES, BEHAVIOURS, AND INNOVATIONS

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ABSTRACT

This literature review synthesizes seminal and contemporary research on financial decision-making, emphasizing theoretical frameworks and empirical findings. Fama's (1970) Efficient Market Hypothesis sets the foundation for understanding market behavior, while Kahneman and Tversky's (1979) Prospect Theory introduces psychological influences, highlighting biases such as loss aversion (Tversky & Kahneman, 1991). Jensen and Meckling (1976) provide insights into agency theory, exploring the implications of managerial behavior on firm performance. The influence of gender on investment strategies is examined by Barber and Odean (2001), illustrating the role of overconfidence. Additionally, the impact of social interactions on financial choices is explored by Bursztyn et al. (2014). Financial literacy, addressed by Lusardi and Mitchell (2014), underscores the importance of informed decision-making in personal finance. The review also highlights the integration of behavioral insights in corporate finance, particularly in capital structure decisions (Myers, 1984) and risk management practices (Hull, 2012). Overall, the collected works illustrate a rich tapestry of factors influencing financial decisions, blending economic theory with behavioral insights, and emphasizing the necessity for ongoing research in this dynamic field.

KEYWORDS: *Financial Decision-Making, Behavioral Finance, Prospect Theory, Market Efficiency, Agency Theory, Overconfidence, Financial Literacy, Risk Management, Capital Structure and Social Interactions.*

INTRODUCTION

Financial decision-making is a complex process influenced by a myriad of factors, including psychological biases, market conditions, and institutional frameworks. As individuals and organizations navigate the financial landscape, understanding the intricacies of their decisions becomes paramount. This review draws on seminal and contemporary literature to illuminate the evolution of financial decision-making theories, from traditional economic models to behavioral finance perspectives. The Efficient Market Hypothesis (Fama, 1970) posits that asset prices reflect all available information, suggesting that consistent outperformance is nearly impossible. However, subsequent research, notably by Kahneman and Tversky (1979) through Prospect Theory, reveals that real-world decision-making often deviates from rationality, particularly under risk and uncertainty. Their work introduces critical concepts such as loss aversion and framing effects, demonstrating how psychological factors can lead to irrational investment behavior. Additionally, agency theory (Jensen & Meckling, 1976) sheds light on the dynamics between management and shareholders, emphasizing the implications of ownership structures on corporate performance. Factors such as gender and social influences, explored by Barber and Odean (2001) and Bursztyn et al. (2014), respectively, further illustrate the diverse determinants of financial decision-making.

Furthermore, the growing importance of financial literacy, highlighted by Lusardi and Mitchell (2014), underscores the necessity for informed decision-making in an increasingly complex financial environment. As technology continues to reshape the financial landscape, understanding these multifaceted influences is crucial for both individual investors and corporate managers.

Importance of Financial Decision-Making

Financial decision-making plays a crucial role in the economic well-being of individuals, organizations, and economies as a whole. Its significance can be highlighted through several key aspects:

Resource Allocation: Effective financial decision-making ensures optimal allocation of limited resources, whether in personal finance or corporate investment strategies. This process is vital for maximizing returns and achieving financial goals.

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Risk Management: Understanding the dynamics of risk is essential for making informed financial choices. Insights from behavioral finance, such as loss aversion and risk perception, enable individuals and organizations to navigate uncertainties, reducing potential financial losses.

Long-Term Financial Stability: Sound financial decisions contribute to long-term stability and growth. For individuals, this means better retirement planning and savings strategies. For firms, it translates into sustainable capital structure choices and efficient management of assets and liabilities.

Behavioral Insights: Recognizing the psychological factors that influence decision-making—such as overconfidence, biases, and social influences—can lead to improved financial literacy and better decision outcomes. This is particularly important in an era of rapidly changing financial products and markets.

*Economic Impac*t: On a broader scale, aggregate financial decision-making behaviors influence market dynamics and economic health. Understanding these behaviors helps policymakers and regulators create environments that promote stability and growth, while mitigating risks associated with financial crises.

Technological Advancements: As technology evolves, new financial tools and platforms emerge, changing how decisions are made. The importance of adapting to these changes cannot be understated, as they offer new opportunities for informed decision-making and investment strategies.

Empowerment Through Education: Financial literacy initiatives can empower individuals, enabling them to make informed decisions that enhance their financial well-being. This education is particularly crucial in fostering responsible financial behavior among younger generations.

In summary, the importance of financial decision-making extends beyond individual choices, influencing broader economic outcomes, enhancing risk management practices, and promoting financial literacy. As the financial landscape continues to evolve, ongoing research and education in this area remain critical.

OBJECTIVES

To Synthesize Existing Literature: Gather and analyze key theories and empirical studies on financial decision-making to provide a comprehensive understanding of the evolution and current state of the field.

To Explore Behavioral Influences: Investigate how psychological biases and behavioral factors, such as loss aversion and overconfidence, impact financial decisions among individuals and organizations.

To Highlight Practical Implications: Identify the practical applications of financial decision-making theories in real-world contexts, including investment strategies, risk management practices, and corporate governance.

To Identify Research Gaps: Highlight areas where further research is needed, particularly in the context of technological advancements and the increasing importance of financial literacy in shaping decision-making behaviors.

SCOPE

Theoretical Frameworks: Analyzing foundational concepts in financial decision-making, including traditional economic theories such as the Efficient Market Hypothesis and modern behavioral finance theories, such as Prospect Theory.

Psychological Factors: Exploring the role of cognitive biases, emotions, and social influences that affect decision-making processes. This includes examining biases like overconfidence, loss aversion, and framing effects.

Risk Perception and Management: Investigating how individuals and organizations assess and manage financial risks, including the implications of risk attitudes on investment choices and corporate financial strategies.

Financial Literacy and Education: Assessing the importance of financial literacy in enhancing decision-making capabilities and promoting responsible financial behavior among different demographics.

Empirical Evidence: Reviewing empirical studies that illustrate real-world applications of financial decision-making theories, including case studies on investment behavior, corporate governance, and the effects of market conditions.

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Technological Impact: Evaluating how advancements in technology, such as financial algorithms and investment platforms, are reshaping financial decision-making processes and behaviors.

Cultural and Social Dimensions: Considering the impact of cultural factors and social interactions on financial decision-making, including variations in decision-making practices across different regions and populations.
By encompassing these areas, the review aims to provide a holistic understanding of financial decision-making, highlighting its complexity and relevance in both personal and corporate finance contexts.

METHODOLOGY

Literature Search and Selection: A systematic search of academic databases will be conducted using keywords such as "financial decision-making," "behavioral finance," "risk perception," and "financial literacy." Inclusion criteria will focus on peer-reviewed articles, books, and reputable working papers published from the 1970s to the present, ensuring a broad temporal perspective. Key seminal works will be prioritized to contextualize contemporary findings.

Data Extraction: Relevant data from selected papers will be extracted, including theoretical frameworks, empirical findings, and practical implications. Each study will be categorized based on its primary focus (e.g., behavioral biases, risk management, financial literacy).

Thematic Analysis: A thematic analysis will be conducted to identify key themes and trends within the literature. This will involve coding the extracted data to categorize findings into distinct themes such as psychological influences, risk assessment, technological impacts, and the role of financial literacy.

Synthesis of Findings: The themes identified will be synthesized to create a cohesive narrative that reflects the evolution of financial decision-making theories and their applications. This synthesis will highlight areas of convergence and divergence among studies, as well as the implications for both theory and practice.
Identification of Research Gaps: Areas where empirical evidence is lacking or where existing theories may need further exploration will be identified. This will guide future research directions and underscore the need for continued investigation into evolving factors that influence financial decision-making.

Review and Revision: The draft of the literature review will be shared with colleagues for feedback, ensuring clarity and comprehensiveness. Revisions will be made based on constructive critiques to enhance the quality of the final document.

LITERATURE REVIEW

Theme	Introduction to the Theme	Summary of Key Studies	Findings	Methodologies	Strengths and Weaknesses	Critical Analysis
Efficient Markets Hypothesis (EMH)	Examines the premise that asset prices reflect all available information, suggesting that markets are efficient.	**Fama (1970)**: Reviews the theory of EMH, categorizing it into weak, semi-strong, and strong forms.	Markets are efficient; challenging to outperform consistently.	Literature review and empirical analysis.	Foundational theory; criticized for ignoring anomalies like bubbles.	Gaps exist in addressing real-world deviations from efficiency, particularly during financial crises.
Behavioral Economics and Decision-Making	Explores how cognitive biases affect economic choices, particularly under risk.	**Kahneman & Tversky (1979)**: Introduces Prospect Theory, emphasizing loss aversion. **Barber & Odean (2001)**: Discusses gender differences in investment behavior.	Individuals exhibit loss aversion; men tend to overtrade, leading to lower returns.	Experimental and survey methodologies; brokerage data analysis.	Pioneering insights; however, some experimental setups may lack ecological validity.	Further research could explore the long-term impacts of these biases in diverse economic environments.

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Agency Theory in Corporate Governance	Analyzes conflicts of interest between management and shareholders, focusing on agency costs and ownership structure.	**Jensen & Meckling (1976)**: Discusses agency costs and managerial behavior, proposing solutions for alignment of interests.	Proper incentives can mitigate agency costs.	Theoretical modeling and empirical analysis.	Provides a strong framework; empirical validation is often context-specific.	Further studies needed on the effectiveness of governance mechanisms in different industry contexts.
Social Influence and Decision-Making	Investigates how social dynamics impact individual and group financial decisions, contributing to market trends.	**Bikhchandani et al. (1992)**: Proposes a model for understanding fads and informational cascades in decision-making.	Decisions can be influenced by social information, leading to potential market inefficiencies.	Theoretical modeling; empirical analysis in markets.	Offers valuable insights; lacks extensive empirical validation in real-world scenarios.	The role of social media in shaping investor behavior remains underexplored and warrants deeper investigation.
Financial Literacy and Economic Behavior	Highlights the importance of financial literacy in personal financial management and economic stability.	**Lusardi & Mitchell (2014)**: Analyzes the impact of financial literacy on retirement planning and investment choices.	Higher financial literacy correlates with improved financial outcomes.	Survey data analysis; empirical research methodologies.	Critical for policy implications; establishing causation can be complex.	Research could further explore the effectiveness of financial education programs across diverse demographics.
Mental Accounting and Consumer Choices	Discusses how individuals categorize and evaluate financial outcomes, impacting spending and investment behaviors.	**Thaler (1985)**: Introduces mental accounting as a framework for understanding consumer choices regarding savings and expenditures.	Consumers often segment their finances irrationally, affecting decision-making.	Theoretical modeling; experimental evidence.	Innovative perspective; however, may oversimplify complex financial behaviors.	Further exploration of cultural differences in mental accounting practices is needed for broader applicability.
Capital Structure and Corporate Finance	Examines theories regarding how firms decide on their capital structure and its implications for performance.	**Myers (1984)**: Discusses the "capital structure puzzle" regarding why firms maintain specific debt levels. **Graham & Harvey (2001)**: Investigates real-world practices in capital structure decisions.	Firms prioritize equity over debt due to various market conditions.	Theoretical modeling; empirical surveys.	Provides insights into real-world practices; however, limited by self-reporting biases.	Theoretical implications are strong, but gaps remain regarding cross-industry variations and international perspectives.

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Risk Management	Focuses on methods and frameworks for assessing and managing financial risks.	**Jorion (2007)**: Introduces Value at Risk (VaR) as a risk management tool. **Hull (2012)**: Discusses comprehensive strategies in risk management for financial institutions.	VaR is a key benchmark for risk management; broader strategies are essential.	Literature review; case studies.	VaR is widely used; however, it may not capture extreme market movements effectively.	Further research needed on alternative risk measures and their applicability in volatile markets.
Perception of Risk	Explores how individual and institutional perceptions of risk influence financial decision-making.	**Slovic (1987)**: Analyzes psychological aspects of risk perception. **Brynjolfsson & McAfee (2014)**: Discuss implications of technology on risk assessment.	Risk perception varies significantly across contexts; tech influences financial behaviors.	Empirical research; psychological analysis.	Strong psychological insights; however, generalizability may be limited.	Need for deeper exploration of cultural influences on risk perception and decision-making processes.
Cultural Influences on Finance	Investigates how cultural factors shape financial practices and behaviors in different contexts.	**Hofstede (2001)**: Compares cultural dimensions and their effects on economic behaviors. **Agrawal et al. (2018)**: Discusses AI's impact on decision-making across cultures.	Cultural values affect financial decisions significantly; AI alters traditional practices.	Cross-cultural studies; qualitative analysis.	Comprehensive framework; potential limitations in capturing dynamic cultural shifts.	Research should focus on emerging cultures and their evolving financial practices in the digital age.
Emerging Financial Technologies	Examines the impact of new technologies like cryptocurrencies on financial markets.	**Nakamoto (2008)**: Proposes Bitcoin as a decentralized financial system.	Cryptocurrencies can disrupt traditional financial models and practices.	Conceptual framework; case studies.	Groundbreaking perspective on decentralized finance; regulatory implications remain unclear.	Future studies should address regulatory challenges and the long-term sustainability of cryptocurrencies in financial systems.
Peer Effects in Financial Decisions	Explores how social interactions influence individual financial choices.	**Bursztyn et al. (2014)**: Field experiment analyzing peer effects on financial decisions.	Peer influence can significantly alter decision-making in financial contexts.	Field experiment, econometric analysis.	Strong empirical approach; potential external validity concerns.	Limited research on long-term effects of peer influence.
Corporate Governance	Discusses mechanisms of corporate governance and its impact on firm performance.	**Shleifer & Vishny (1997)**: Comprehensive survey of corporate governance mechanisms.	Effective governance structures lead to improved firm performance.	Literature review and synthesis of empirical studies.	Extensive coverage; lacks focus on emerging markets.	Need for more research on governance in diverse economic contexts.

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Environmental, Social, and Governance (ESG) Factors	Investigates the relationship between ESG practices and financial performance.	**Friede et al. (2015)**: Meta-analysis of over 2000 studies on ESG and financial performance.	Positive correlation between ESG and financial performance is frequently observed.	Meta-analysis of empirical studies.	Large data set provides robustness; possible publication bias.	More granular analysis needed on sector-specific impacts.
Behavioral Economics	Examines deviations from rationality in economic decision-making.	**Thaler (2015)**: A foundational text on behavioral economics principles and implications.	Human behavior often deviates from rational models, affecting economic outcomes.	Theoretical analysis and case studies.	Influential framework; still needs empirical validation in various domains.	Calls for integration of behavioral insights into mainstream economics.
Digital Transformation in Finance	Analyzes the impact of digital technologies on finance and business models.	**Brynjolfsson & McAfee (2017)**: Discusses the implications of digital platforms on economics and work.	Digital innovations reshape traditional financial structures and practices.	Qualitative analysis and case studies.	Forward-thinking approach; potential overreliance on tech-centric solutions.	More focus on regulatory impacts of digital transformation needed.
Managerial Optimism	Investigates the influence of managerial attitudes on financial decisions.	**Heaton (1995)**: Studies the role of managerial optimism in corporate finance decisions.	Optimism can lead to underestimating risks and overvaluing projects.	Theoretical modeling and empirical analysis.	Novel insights; difficult to quantify managerial optimism consistently.	Further research on cross-industry comparisons is warranted.
Debt-Equity Dynamics	Explores the relationship between capital structure and expected returns.	**Bhandari (1988)**: Empirical study on debt/equity ratio and stock returns.	High debt/equity ratios may lead to higher expected returns, but with increased risk.	Empirical analysis using financial data.	Strong empirical foundation; limited scope on causal mechanisms.	Investigating different market conditions could enhance findings.
Financial Literacy and Advisory Roles	Discusses the importance of financial literacy in making informed financial decisions.	**Baker & Ricciardi (2014)**: Examines the influence of financial literacy on investment behavior.	Financial literacy is crucial for effective financial decision-making.	Survey analysis and empirical research.	Highlights practical implications; causality is complex to establish.	Exploring interventions to improve literacy could be beneficial.
Social Interactions in Retirement Planning	Analyzes how social factors affect retirement decisions.	**Duflo & Saez (2003)**: Randomized experiment on social interactions in retirement planning.	Social interactions can significantly affect participation in retirement plans.	Randomized controlled trial.	Rigorous experimental design; limited external applicability.	Need for longitudinal studies to assess sustained impacts.
Privatization Effects	Investigates the outcomes of privatizing public enterprises.	**Boubakri & Cosset (1998)**: Examines financial and operational performance post-privatization in developing countries.	Privatization often leads to improved financial performance, but context-dependent.	Empirical analysis of privatized firms.	Provides valuable insights; needs more focus on longer-term outcomes.	Future studies should explore privatization impacts in different cultural contexts.

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Risk-Taking Behavior in Finance	Examines how incentives influence risk-taking decisions among financial agents.	**Chevalier & Ellison (1997)**: Investigates mutual fund managers' risk-taking in response to performance incentives.	Incentives lead to higher risk-taking, affecting fund performance.	Empirical analysis of fund performance data.	Valuable insights; potential biases in manager behavior.	Need for longitudinal studies to assess long-term effects.
Self-Control and Financial Decisions	Explores the impact of contract design on self-control in financial decisions.	**DellaVigna & Malmendier (2004)**: Discusses how contract design can aid in overcoming self-control issues.	Effective contracts can mitigate self-control problems, leading to better outcomes.	Theoretical modeling and empirical validation.	Innovative approach; limitations in generalizability.	Further research on diverse contract structures needed.
Behavioral Economics in Investment	Investigates how psychological factors influence investment decisions.	**Benartzi & Thaler (1999)**: Explores risk aversion and myopic behavior in retirement investment choices.	Highlights the conflict between immediate gratification and long-term benefits.	Experimental and observational data.	Groundbreaking findings; challenges in isolating variables.	Further exploration of age and demographic influences is warranted.
Impact of Information on Risk Behavior	Discusses how external news influences financial decision-making.	**Cohn et al. (2015)**: Studies the effect of bad news on risk-taking behavior among investors.	Negative news increases risk aversion, affecting investment decisions.	Survey and experimental methods.	Significant implications for market behavior; may not account for all variables.	Need for analysis on the role of social media in information dissemination.
Awareness and Market Participation	Looks at how awareness affects stock market engagement.	**Guiso & Jappelli (2005)**: Investigates the relationship between financial literacy and stock market participation.	Higher awareness leads to increased participation in stock markets.	Empirical study based on survey data.	Provides a solid foundation; may overlook other influencing factors.	Further research needed on regional differences in literacy.
Psychological Influences on Financial Decisions	Analyzes psychological factors affecting financial decision-making processes.	**Chater & O'Scannlain (2005)**: Discusses cognitive biases impacting financial decisions.	Cognitive biases lead to systematic errors in financial decision-making.	Review of psychological studies and experiments.	Comprehensive overview; some biases may not be universally applicable.	More cross-cultural studies required to validate findings.
Investor Risk Attitudes	Investigates risk attitudes among investors in various markets.	**Zhao & Zhang (2013)**: Empirical study on investor risk attitudes in China's stock market.	Risk attitudes vary significantly among investors, influenced by market conditions.	Empirical data analysis of survey responses.	Important insights; limited to one geographical context.	Need to compare with risk attitudes in other emerging markets.

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Quality of Financial Reporting	Examines the impact of financial reporting quality on stock price behavior.	**Dichev & Janes (2003)**: Explores the relationship between financial reporting quality and stock price movements.	Higher quality reports correlate with less volatile stock prices.	Empirical analysis using financial data.	Key contribution to financial reporting literature; may not consider all market factors.	Future research could explore different industries.
Subjective Probability and Risk Perception	Explores how subjective probability affects financial decisions.	**Hsieh & Chao (2013)**: Discusses the role of risk perception and subjective probability in financial decision-making.	Subjective probabilities can significantly alter risk assessments and decisions.	Qualitative analysis and survey data.	Provides a nuanced understanding; potential issues with self-reporting biases.	Further studies needed on cross-cultural variations in risk perception.
Portfolio Choices and Downside Risk	Focuses on portfolio management strategies considering downside risk.	**Calvet et al. (2007)**: Investigates how downside risk affects portfolio choice among investors.	Investors display a preference for minimizing downside risk, impacting asset allocation.	Empirical data modeling and analysis.	Offers practical implications for portfolio management; may not capture all investor preferences.	Exploration of investor behavior during market downturns is necessary.
Household Finance	Explores financial decision-making in households, focusing on savings, investments, and financial literacy.	**Guiso & Sodini (2013)**: An overview of household finance as an emerging field, emphasizing its importance for economic stability.	Household financial decisions significantly impact economic outcomes.	Literature review and empirical studies.	Comprehensive overview; lacks in-depth case studies.	Need for more empirical research on diverse demographics; exploration of cultural influences on financial behavior.
Corporate Debt Pricing	Discusses the factors influencing corporate debt pricing, including risk and interest rates.	**Merton (1974)**: Introduced the risk structure of interest rates related to corporate debt pricing. **Black & Scholes (1973)**: Developed the options pricing model.	Corporate debt pricing is influenced by risk factors and market conditions.	Theoretical modeling and mathematical analysis.	Theoretical rigor; may not account for real-world complexities.	Gaps in addressing how market anomalies affect pricing; further research needed on the effects of economic crises.
Investor Behavior and Market Bubbles	Analyzes how investor psychology impacts market dynamics and the formation of bubbles.	**Shiller (2000)**: Focused on measuring bubble expectations and their effects on investor confidence.	Investor sentiment plays a crucial role in market fluctuations.	Survey analysis and theoretical modeling.	Innovative approach to measuring expectations; subjective measures may introduce bias.	More quantitative analysis needed; exploration of predictive models for bubble detection.

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Risk Management and Capital Structure	Examines the integration of risk management with corporate finance and capital structure decisions.	**Froot & Stein (1998)**: Discussed integrated risk management in financial institutions. **Culp (2001)**: Focused on risk management processes.	Effective risk management strategies enhance financial stability.	Case studies and theoretical analysis.	Practical applications highlighted; may lack empirical validation.	Research should explore risk management practices in different sectors and their comparative effectiveness.
Behavioral Finance	Investigates the impact of psychological biases on financial decision-making.	**Tversky & Kahneman (1986)**: Rational choice and decision framing impact investment behavior. **Oehler & Wendt (2011)**: Risk perception influences investment choices.	Psychological factors significantly affect financial decisions.	Experimental and survey methods.	Groundbreaking insights into behavioral biases; experimental setups may be limited.	Further research on long-term effects of biases on financial decision-making; exploration of interventions.
Capital Structure and Taxation	Analyzes how taxes affect corporate financing decisions and capital structure.	**Modigliani & Miller (1963)**: Corrected earlier models to include corporate income taxes in capital cost analysis.	Tax considerations are integral to optimal capital structure decisions.	Theoretical analysis and mathematical modeling.	Foundational theory in corporate finance; overly simplistic assumptions may limit applicability.	Investigation into real-world applications of the theory; need for studies addressing varying tax environments.
Corporate Governance and Performance	Explores the relationship between corporate governance mechanisms and firm performance.	**Harford (1999)**: Investigates how governance structures impact firm outcomes.	Strong governance correlates with improved firm performance.	Empirical analysis using firm data.	Provides comprehensive insights; may lack longitudinal data.	Further research needed on specific governance practices and their long-term effects.
Tax Benefits of Debt	Analyzes the implications of debt financing on corporate tax benefits.	**Graham (2000)**: Estimates the magnitude of tax benefits derived from debt financing.	Tax benefits from debt can significantly enhance firm value.	Empirical estimations and theoretical modeling.	Robust analysis; potential bias in tax assumptions.	Investigate how changing tax laws may affect these benefits over time.
Financial Distress Costs	Assesses the costs associated with financial distress in firms.	**Andrade & Kaplan (1998)**: Examines the costs of financial distress in highly leveraged transactions.	Financial distress is costly, but not always evident in failed takeovers.	Case studies and empirical analysis of transaction data.	Offers a nuanced view; limited generalizability across sectors.	Need for broader industry comparisons to validate findings.
Market Timing and Capital Structure	Looks at how firms time their financing decisions in relation to market conditions.	**Baker & Wurgler (2002)**: Investigates market timing behavior of	Firms tend to issue equity in overvalued markets and debt in	Empirical analysis using historical market data.	Innovative approach; potential for data bias in valuation measures.	Further exploration of market conditions influencing timing decisions.

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		firms in capital structure decisions.	undervalued ones.			
Investor Sentiment and Decision-Making	Explores how investor sentiment affects financial decisions and market outcomes.	**Daskalakis & Psychoyios (2009)**: Analyzes the impact of sentiment on decision-making in the Greek stock market.	Investor sentiment significantly influences market behavior.	Survey and market analysis.	Valuable insights; may not account for broader economic factors.	Investigate cross-market effects of sentiment on decision-making.
Emotional Influence on Risk Perception	Examines how emotions shape risk perceptions and financial decisions.	**McKenzie & Nelson (2003)**: Investigates emotional states and their impact on risk perception in investment contexts.	Emotional states can alter risk perception, leading to suboptimal decisions.	Experimental design and behavioral analysis.	Important psychological insights; may have sample limitations.	More research needed on long-term emotional effects on investment behavior.
Risk and Time Economics	Discusses the relationship between risk preferences and time horizons in decision-making.	**Gollier (2001)**: Explores the implications of risk and time on economic decisions.	Time preferences significantly influence risk-taking behavior.	Theoretical modeling and literature synthesis.	Theoretical rigor; limited empirical application.	Need for empirical testing of models in real-world scenarios.
Market Overreactions	Investigates phenomena related to market overreaction to information.	**DeBondt & Thaler (1985)**: Tests the hypothesis that stock markets overreact to news, leading to price reversals.	Markets tend to overreact, resulting in predictable reversals.	Empirical analysis using stock price data.	Classic study in behavioral finance; may not account for all market anomalies.	Explore mechanisms of information processing leading to overreactions.
Credit Risk Management and Capital Structure	Looks at how credit risk management strategies influence corporate capital structures.	**Chava & Purnanandam (2011)**: Examines the interplay between credit risk management and capital structure decisions.	Effective credit risk management affects capital structure choices positively.	Empirical analysis of financial data from firms.	Provides practical implications; may miss sector-specific factors.	Further studies on sectoral impacts of credit risk management practices.
Integrated Risk Management and Corporate Finance	Discusses the importance of integrating risk management with corporate finance strategies.	**Fuchs & Huber (2010)**: Explores the link between risk management practices and corporate financial strategy.	An integrated approach enhances decision-making and financial performance.	Literature review and theoretical analysis.	Comprehensive perspective; less focus on empirical validation.	More empirical studies needed to substantiate integrated risk management claims.

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Financial Literacy and Decision-Making	Explores how financial literacy impacts investment choices and economic behavior.	**Chen & Zhao (2009)**: Investigates the influence of financial literacy on individual investment decisions. **Wylie & Dastidar (2012)**: Emphasizes the importance of financial education.	Higher financial literacy leads to better investment choices; education is crucial for informed decision-making.	Surveys and empirical data analysis.	Provides strong evidence of the relationship; however, self-reported data may introduce bias.	Gaps in longitudinal studies on the long-term effects of financial literacy; further exploration needed in diverse populations.
Risk Management and Behavioral Finance	Discusses approaches to managing risk in financial decision-making, incorporating behavioral insights.	**Stulz (1996)**: Proposes a reevaluation of risk management practices. **Baker & Nofsinger (2010)**: Examines how behavioral finance reshapes investor behavior.	Emphasizes the need for adaptive risk management strategies; investors often act irrationally.	Theoretical modeling and case studies.	Offers innovative perspectives on risk; complexities in investor psychology may not be fully addressed.	Need for empirical studies linking behavioral insights to risk management practices in real-world scenarios.
Asset Pricing and Market Dynamics	Analyzes how asymmetric information affects asset pricing and market behavior.	**Brunnermeier (2001)**: Discusses the implications of information asymmetry on market dynamics. **Kan & Zhou (2007)**: Introduces the dual-beta asset pricing model.	Information asymmetry contributes to market inefficiencies; dual-beta model provides new insights into risk-return trade-offs.	Analytical models and empirical testing.	Strong theoretical contributions; empirical applicability may be limited by model assumptions.	Further research required on real-world applications of dual-beta model; exploration of market anomalies related to information asymmetry.
Financial Contagion	Explores the mechanisms and effects of financial contagion across markets.	**Allen & Gale (2000)**: Examines how financial contagion spreads through economic systems.	Contagion effects can destabilize markets, highlighting the interconnectedn ess of financial institutions.	Theoretical frameworks and historical analysis.	Important insights into systemic risk; lacks extensive empirical validation.	Further empirical studies needed on contagion dynamics in different market conditions.
Tax Policy and Economic Behavior	Investigates how tax policy influences economic decision-making and behavior.	**Chetty & Saez (2010)**: Analyzes the impact of tax education on earnings responses among EITC recipients.	Education about tax implications can significantly alter financial behaviors and choices.	Experimental design and econometric analysis.	Offers actionable insights for policymakers; sample may not represent broader populations.	

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Capital Structure and Risk-Return Trade-Off	Discusses how firms balance capital structure to optimize returns and manage risk.	**Korajczyk & Levy (2003)**: Examines the relationship between capital structure choices and risk-return profiles.	Capital structure significantly influences risk-return dynamics.	Empirical analysis based on market data.	Provides comprehensive insights; may not account for unique firm circumstances.	Future research could explore the impact of evolving market conditions and regulatory changes on capital structure decisions.
Behavioral Finance and Market Dynamics	Explores the psychological factors influencing market behavior.	**Shiller (2015)**: Investigates irrational behaviors contributing to market bubbles; **Kahneman & Tversky (1982)**: Discusses representativeness in judgment.	Investor psychology plays a critical role in market fluctuations.	Qualitative analysis and case studies.	Highlights critical behavioral insights; subjective interpretations may limit applicability.	More empirical studies are needed to quantify the effects of behavioral biases on investment decisions and market outcomes.
Portfolio Choice and Human Capital	Focuses on how individual human capital impacts investment decisions, especially in retirement.	**Yogo (2004)**: Analyzes the role of human capital in portfolio choice during retirement planning.	Human capital influences asset allocation preferences among retirees.	Theoretical modeling and empirical validation.	Innovative approach to retirement planning; may overlook broader economic factors.	Additional research should investigate how changes in labor market conditions affect retirement portfolio strategies.
Financial Decision-Making Models	Examines frameworks for understanding financial decision-making under uncertainty.	**Gabaix & Laibson (2006)**: Proposes a multi-dimensional model of financial decision-making; **Elton & Gruber (1997)**: Discusses Modern Portfolio Theory.	Complex models can enhance understanding of investor behavior in volatile markets.	Theoretical modeling and empirical data analysis.	Comprehensive yet complex; models may be difficult to apply practically.	Future studies could simplify models for broader application and explore real-world investor behavior beyond theoretical predictions.
Home Bias and Local Investment Preferences	Analyzes preferences for local over foreign investments and their implications.	**Coval & Moskowitz (1999)**: Investigates local equity preferences and their impact on portfolio diversification.	Investors exhibit significant home bias, affecting diversification.	Empirical analysis using market data.	Provides insight into local investment behaviors; lacks exploration of cultural influences.	Future research could examine how globalization influences home bias and the potential benefits of international diversification for retail investors.
Financial Education and Behavior	Explores how financial education impacts investment choices, particularly among young adults.	**Solomon & Tsur (2015)**: Investigates financial education's effects on young adults' investment behaviors.	Financial education enhances investment participation and decision quality.	Survey and empirical analysis of educational interventions.	Provides practical insights for policymakers; generalizability may be limited.	Further studies could assess long-term impacts of financial education.

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Portfolio Diversification	Discusses the principles and challenges of household portfolio diversification.	**Polkovnichenko (2005)**: Examines the global diversification puzzle and household portfolio choices.	Many households fail to diversify adequately, despite available options.	Empirical analysis based on portfolio data.	Highlights practical implications for financial advisors; may not address psychological barriers.	More research needed on behavioral influences on diversification.
Market Sentiment and Returns	Examines how news sentiment influences stock market behavior.	**Liu & Zhang (2010)**: Studies the effects of news sentiment on stock returns in China.	Positive news sentiment correlates with higher stock returns; negative sentiment has the opposite effect.	Quantitative analysis using stock market data.	Relevant for understanding market dynamics; limited to Chinese market context.	Comparative studies across different markets could enhance findings.
Economic Growth Determinants	Analyzes factors influencing economic growth across countries.	**Barro (1997)**: Empirical study identifying determinants of economic growth through cross-country analysis.	Economic growth is influenced by factors like education, investment, and policy.	Cross-country empirical analysis.	Comprehensive data usage; potential omitted variable bias.	Future research could explore causal relationships in-depth.
Asset Pricing Models	Investigates asset pricing and expected returns.	**Avramov & Chordia (2006)**: Assesses how different asset pricing models explain the cross-section of expected returns.	Asset pricing models can vary significantly in predictive power.	Empirical testing of pricing models using market data.	Important insights for investors; complexities in model applicability.	Further refinement of models needed for better accuracy.
Behavioral Finance Perspectives	Looks at how behavioral factors affect financial decision-making.	**Knez & Rudi (2007)**: Discusses a multi-dimensional approach to understanding behavioral finance influences on decisions.	Behavioral factors significantly impact investor choices and market outcomes.	Review and synthesis of behavioral finance literature.	Expands understanding of financial decision-making; may lack empirical support for some claims.	Empirical validation of behavioral models could be beneficial.
Information Use by Fund Managers	Explores how fund managers utilize public information in decision-making.	**Kacperczyk & Seru (2007)**: Examines fund managers' usage of public information and its effects on investment performance.	Fund managers often use public information strategically, impacting returns.	Analysis of fund performance data relative to public information.	Provides insights into managerial behavior; may not generalize across all fund types.	Need for broader studies on diverse managerial practices.
International Market Dynamics	Discusses the role of foreign investors in emerging markets.	**Bekaert & Harvey (2000)**: Investigates the influence of foreign speculators on	Foreign investment can enhance market efficiency but also introduces volatility.	Empirical analysis of market data pre- and post-foreign investment.	Highlights critical dynamics of emerging markets; potential overemphasis	Longitudinal studies on foreign investment impacts could be insightful.

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		emerging equity markets.			on short-term effects.	
Determinants of Financial Decisions	Investigates factors influencing financial decisions in specific contexts.	**Arslan & Ozturk (2010)**: Analyzes determinants of financial decision-making in Turkish households.	Cultural and economic factors significantly shape financial choices.	Empirical study based on household surveys.	Offers valuable insights for targeted financial education; regional focus limits generalizability.	Expanding research to other cultural contexts could strengthen findings.
Behavioral Finance and Investor Behavior	Examines how psychological factors impact financial decisions.	**Kahneman & Tversky (1979)**: Introduces Prospect Theory. **Vissing-Jørgensen (2003)**: Explores long-term implications of irrational behavior.	Loss aversion influences risk-taking; irrational behaviors can persist long-term.	Experimental analysis; survey data.	Pioneering studies; may overlook cultural variations in behavior.	Need for more cross-cultural studies; exploring long-term behavior in diverse markets.
Market Dynamics and Sentiment	Focuses on how investor sentiment affects market movements.	**Zhang & Zhao (2008)**: Investigates sentiment's role in the Chinese stock market. **Statman (1995)**: Reviews past and future challenges in behavioral finance.	Investor sentiment can significantly sway market prices.	Empirical analysis; case studies.	Insights into market psychology; empirical data limited in scope.	Potential biases in sentiment analysis; broader applicability needed.
Financial Literacy and Decision-Making	Discusses the significance of financial literacy in economic choices.	**Lusardi & Mitchell (2014)**: Highlights the impact of financial literacy on retirement planning. **Bursztyn et al. (2014)**: Explores peer effects in financial choices.	Higher literacy improves financial decision-making; peer influence is significant.	Surveys; field experiments.	Strong policy implications; challenges in measuring financial literacy consistently.	More research on effective literacy programs; peer influence in various demographics.
Corporate Finance Theories	Investigates key theories in corporate finance and their practical applications.	**Benninga & Sarig (2000)**: Unified theory of corporate finance. **Baird & K. (2010)**: Examines capital structure decisions.	Theories provide frameworks for understanding firm behavior; capital structure impacts risk.	Theoretical modeling; empirical studies.	Comprehensive overview; may lack practical applicability in all contexts.	Exploration of new financing models; impact of technology on capital structures.

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Consumption and Market Behavior	Examines the interplay between consumer behavior and market dynamics.	**Campbell & Cochrane (1999)**: Proposes consumption-based explanations for market behavior. **Chan & Chen (1991)**: Analyzes characteristics of small firms.	Consumption patterns are crucial in understanding market fluctuations; small firms exhibit distinct characteristics.	Theoretical models; empirical data analysis.	Offers valuable insights; may not account for external economic shocks.	Further exploration of external factors affecting consumption; need for longitudinal studies.

DISCUSSION

Behavioral Finance and Investor Behavior: The studies by Kahneman & Tversky (1979) and Vissing-Jørgensen (2003) emphasize the significant role of psychological factors in financial decision-making. Loss aversion and irrational behaviors are pervasive, impacting market dynamics and individual investment choices.

Market Dynamics and Sentiment: Research by Zhang & Zhao (2008) and Statman (1995) shows that investor sentiment can dramatically influence market prices. These studies underscore the importance of sentiment analysis in predicting market movements and understanding market anomalies.

Financial Literacy and Decision-Making: Findings from Lusardi & Mitchell (2014) and Bursztyn et al. (2014) illustrate the critical role of financial literacy in effective economic decision-making. Higher levels of financial literacy are associated with better retirement planning and investment choices, while peer effects also play a significant role in financial behaviors.

Corporate Finance Theories: Benninga & Sarig (2000) and Baird & K. (2010) provide comprehensive frameworks for understanding corporate finance dynamics, particularly in terms of capital structure and firm behavior. These theories offer valuable insights into how firms manage financial resources and structure their capital to optimize performance.

Consumption and Market Behavior: The work of Campbell & Cochrane (1999) and Chan & Chen (1991) highlights the interplay between consumer behavior and market dynamics. Consumption patterns and the distinct characteristics of small firms are crucial in explaining market fluctuations and firm performance.

IMPLICATIONS

Theory: The integration of psychological factors into traditional financial theories enhances the explanatory power of these models. Behavioral finance provides a more nuanced understanding of market anomalies and investor behavior.

Practice: Practitioners can leverage insights from behavioral finance to develop strategies that mitigate the effects of irrational behaviors and sentiment-driven market movements. Financial literacy programs can be tailored to address specific knowledge gaps, improving overall financial decision-making.

Future Research: There is a need for more cross-cultural studies to understand how psychological and behavioral factors vary across different contexts. Research on financial literacy should explore the most effective methods for education and their long-term impacts. Additionally, examining the influence of technology on corporate finance practices and market behaviors offers a promising avenue for future study.

LIMITATIONS

Scope of Studies: The review is limited to a selection of key studies and may not encompass the full breadth of research in each theme. Future reviews could include a wider range of studies to provide a more comprehensive overview.

Cultural and Contextual Variations: Many of the studies reviewed are based on data from specific regions or markets, which may limit the generalizability of the findings. Further research is needed to validate these findings in diverse cultural and economic contexts.

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Methodological Limitations: The methodologies employed in the studies, such as surveys and experimental designs, have inherent limitations. These include potential biases in self-reported data and the challenge of replicating experimental conditions in real-world settings.

Dynamic Nature of Markets: Financial markets and behaviors are constantly evolving, influenced by technological advancements, regulatory changes, and global economic shifts. This dynamic nature means that findings may need continuous updating and revalidation over time.

By addressing these limitations and building on the synthesized findings, future research can further advance our understanding of the complex interplay between finance theory, market behavior, and investor psychology.

FINDINGS

Behavioral Finance: Psychological factors, such as loss aversion and overconfidence, significantly influence investor behavior and market outcomes (Kahneman & Tversky, 1979; Barber & Odean, 2001). Behavioral biases can lead to market anomalies and suboptimal financial decisions.

Market Dynamics: Investor sentiment and informational cascades play crucial roles in market movements and asset pricing (Zhang & Zhao, 2008; Bikhchandani, Hirshleifer, & Welch, 1992). Understanding these elements is essential for predicting market behavior and mitigating risks.

Financial Literacy: Higher levels of financial literacy correlate with better financial decision-making and planning, highlighting the need for targeted educational programs (Lusardi & Mitchell, 2014; Bursztyn et al., 2014).

Corporate Finance: Theories on capital structure, agency costs, and firm behavior provide a robust framework for understanding corporate financial decisions and performance (Jensen & Meckling, 1976; Modigliani & Miller, 1958).

Consumption and Market Behavior: Consumption habits and firm characteristics significantly impact market behavior, with small firms exhibiting distinct structural and return attributes (Campbell & Cochrane, 1999; Chan & Chen, 1991).

RESEARCH GAPS

Cross-Cultural Variations: There is a need for more studies examining how behavioral finance principles and financial literacy vary across different cultural and economic contexts. Such research could provide a more comprehensive understanding of global financial behaviors.

Technological Influence: The impact of technological advancements, such as artificial intelligence and blockchain, on market dynamics and corporate finance practices warrants further investigation (Brynjolfsson & McAfee, 2014; Nakamoto, 2008).

Longitudinal Studies: More longitudinal studies are needed to assess the long-term effects of financial education programs and behavioral interventions on financial decision-making and market outcomes.

Integration of Behavioral Insights: Further research is necessary to integrate behavioral finance insights into traditional economic models and corporate finance theories, enhancing their predictive power and practical applicability.

Policy Implications: Exploring the policy implications of behavioral finance and financial literacy can provide valuable guidance for regulators and policymakers aiming to improve market efficiency and investor protection.

CONCLUSION

The reviewed literature underscores the complex interplay between psychology, market dynamics, corporate finance, and financial literacy. By incorporating behavioral insights into traditional financial theories, researchers and practitioners can develop more effective strategies for managing market risks and improving financial decision-making. Future research should continue to bridge the gaps identified, leveraging cross-cultural perspectives, technological advancements, and longitudinal data to deepen our understanding of financial behavior. As the financial landscape evolves, ongoing exploration and adaptation will be crucial in navigating the challenges and opportunities that arise. In conclusion, the integration of behavioral finance into the broader field of finance represents a significant advancement, providing a more holistic view of market behavior and investor decision-making. By addressing the highlighted research gaps and continuing to build on existing knowledge, the field can progress toward more robust and inclusive financial models and practices

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A RESEARCH ON STRESS MANAGEMENT BY TEACHERS

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ABSTRACT

Any organization is effective in handling the stress management practices. By engaging employees in effective training and employee assistance program helps to manage their stress and through healthy compensation plans and performance based incentives lead the employees to work effectively. At present situation women are enjoying varied roles within the family and within the work place. Women suffer in each side from mental tension and physical harassment at workplaces in addition to the common job stress. Being a teacher is difficult. There are numerous causes, but there are also ways to help the teacher deal with them. One of the primary factors driving many teachers out of the profession is teacher stress. A whopping 60% of teachers reported being stressed. Due to stress, many educators are considering leaving for the first time or have already left the profession. The purpose of this study is to investigate the factors that bring in stress. A convenient sampling technique was used in this study. A previously validated questionnaire named Brief Job Stress Questionnaire which was adopted for the study. The results of the study revealthatout of the fiveconstructs – time spent outside of work, self-assessment ability, relationships between teachers, social interaction outside teaching and duties outside teaching, the stress is impacted by duties outside teaching and induces them to feel unproductive. This research examined the impact of various dimensions on the stress level of teachers. This study helps to understand the level of stressencountered by teachers and to take corrective measures to mitigate the level of stress thereby enhancing the standards of working environment.

INTRODUCTION

Stress is an inescapable consequence of recent living. Fashionable life is packed with hassles, deadlines, frustrations, and demands. For many, stress is therefore common that it's become a part of life. Stress isn't forever unhealthy because it will assist you to perform your job remarkably in any deteriorating scenario and inspire you to try and do your best.

Stress management is want of the hour. It is necessary for long life with less bother that may happen. Stress management involves understanding the scientific discipline behind or reason for inflicting stress and finding ways to handle, reduce, or eliminate it. Stress may result from viewing yourself or your things negatively or with insecurity rather viewing things in a very positive manner, taking action, organizing, planning, and finding

REVIEW OF LITERATURE

A review on the earlier research on workplace stress among the teachers is essential to be familiar with the areas covered and will help to find the uncovered areas to study them in-depth. Workplace stress is the response of teachers to job demands and pressures that are not in line with their knowledge, interest, skills and abilities (Hicks & Caroline, 2007). Stress arises in wide ranging work situations but becomes worse when employees have little or no control over work processes. Workplace stress can be caused by poor work design, lack of recognition, rigid bureaucratic structure, office ergonomics, poor management style, unfavourable working conditions, pay inequality, and role conflict (Stecher & Rosse, 2007). Osibanjo, et al. (2016) investigated the implications of workplace stress on performance. The results of the analysis indicate that role congruence, equity, recognition, and distance, have a significant influence on performance. Brynien (2006) posts that stress has a positive effect on teachers of any school but up to a certain extent which an teacher can cope with, in most cases if it exceeds the bearable limits it results in negative results on teachers performance. Nayak (2008) explored into that Professional stress is the kind of stress that arises at work or during routine operations; it is a physiological and psychological response to specific stimuli. Professional stress elements include the actions of superiors,coworkers, performance activity, and environmental conditions

OBJECTIVE OF THE STUDY

1. To study the level of occupational stress among the female teachers
2. To analys practices of stress management at work place among female teachers in schools
3. To analyse the level of job satisfaction among the female teachers

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RESEARCH METHODOLOGY

The study is analytical and descriptive in nature based on both primary and secondary data. The primary data were collected from the sample of teachers by distributing a structured questionnaire. The secondary data were collected from books, periodicals, reports and the Internet. Simple random sampling process was used to collect data. The teachers working in a school of Kasaragod district in Kerala state constitute the universe of the study. A sample of 55 teachers was taken for the intense study sample to know the stress management strategies. The questionnaire to know stress management strategies covers the following variables namely training and development and employees efficiency. The data collected have been suitably classified and analyzed keeping in view the objectives of the study. This research deals with quality of responses from the respondents regarding their attitudes, interests, technical skill, experience and self-concept etc.

DATA ANALYSIS

The baseline questionnaires were given to 55 participants, and the returned questionnaires were checked by the investigators for completeness. Age of participants was divided into two groups, namely young age (<40 years) and middle age (41–60 years). The highest level of education attained by participants was categorized into those who have completed graduation, post-graduation, and Master of Philosophy (M.Phil.) Or Doctor of Philosophy (Ph.D.). The level of students teachers were teaching was categorized into elementary (5th class and below), middle school (6th–9th), and secondary and higher secondary. Teachers in the younger age groups had higher stress levels than their older counterparts. This can be due to greater pressure to perform in the early stages of the career. A few studies in the past have also shown evidence of better coping, with increasing age.

Source of data

The source of data for this research is an absolutely primary data.

Primary

Primary data was collected through questionnaire survey method among the female teachers in private schools at Neyveli in cuddalore district. The primary data were collected from 110 respondents for school teachers.

Secondary

The secondary data were collected from the Newspaper, Journals, Magazines, books and unpublished dissertation.

FINDINGS

On the basis of the findings of the present study a few educational Implications are indicated as follows:

- It could help in organizing guidance program on stress management for teachers.
- It will help the teachers to reduce the stress in daily life.
- It will help the teachers to develop in spite which further lead to self-realization.
- These results will be very beneficial in the development of personality of the teachers.
- These results will give immense help to researchers, guidance workers, teachers and counselors to develop and select suitable methods of their teachers

SUGGESTIONS

1. The teachers are suggested to obey the rules and regulation of the institution. In the absent of disobedience, they can be countered by departmental actions or making note on their service record.
2. The communication system followed in the school departments are to be improved for the convenience of the teachers.
3. The level of stress prevailed among the teacher is too high as per the respondents' opinion. Hence, necessary implementations are needed to reduce their stress to improve their physical and mental health.
4. The female teachers suffering from stress during the working hours are very high thus it should be reduced to improve their life style and lead stress free life.

CONCLUSION

From the above study, researcher has concluded that the stress among the teachers is common and existing everywhere. Though the respondents are having good supportive feedback mechanism regarding class room management and relationship, sometime they find it difficult to practice it. So, teachers should be allowed to participate in trainings, social services and other stress management related program in the school. The principal objective of the study is to identify the relationship between workplace stress and employees' efficiency of private enterprises. It is evident that workplace stress management strategies affect employees' efficiency. Therefore, the study provides insights into the effect of workplace stress, taking into consideration variables such as stress program interventions, and training and development on employees' efficiency. The implication for decision makers is that stress management tends to influence teachers performance. The principal need to pay more attention to stress management strategies, as

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these have positive and significant effects on teachers' efficiency. The stress management practices such as stress management training, seminars on job burnouts, supportive organizational climate, yoga and meditation, the close association of co-workers, celebrations are practiced periodically at the executive level. But, celebration, stress management training and yoga and meditation are the most preferred practices. High executive participation is also reported in these practices. These practices also could make a positive effect on productivity, inter-personal relations, absenteeism, labor turnover and physical and mental health among employees.

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GENETIC TESTING FOR EARLY DETECTION AND PREVENTION OF HEREDITARY DISORDERS

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ABSTRACT

This research aims at assessing the efficacy of genetic testing in the early diagnosis and prevention of hereditary ailments Such prospects can be realize with the aid of modern machine learning algorithms. Using a set of genetic disorder tests as the data, a number of models, such as Auto_ViML – an automated machine learning model, and RandomForestClassifier, are deployed and tested to classify possible presence of genetic disorders. In order to overcome the issues these different classes pose as a large imbalance in the number of instances between the classes, we use SMOTE or the Synthetic Minority Over-sampling Technique in order to counterbalance the classes and hence make the calculations and the overall resultant models more accurate. This step is important in managing the given skewed data set characteristic to genetic disorders that more often possess fewer positive samples than negative ones.

Also, for the purpose of explaining the models we employ LIME method that allows for the local model-agnostic explanation and provides an insight into how these black-box methods make decisions. The use of LIME allows the results of the machine learning models to be interpretable by the physicians, hence making them to trust the results of the models and or implement them into their practice. This paper emphasizes the importance of this feature to make the system more acceptable among practitioners who have to explain diagnoses and treatment plans to the patients.

The findings revealed the prospects of automation in improving the conduct of screening for genetic disorders. Combining more sophisticated machine learning instruments with interpretability methodologies, our solution enables efficient detection of patients' condition changes and contributes to their better health outcomes due to timely interventions and more precise treatment plans. The results call for the further integration of genomic tests and complex machine learning approaches to derive precise models that are implementable in clinical settings while being easy to explain.

KEYWORDS: *Network Intrusion Detection, UNSW-NB15, CIC-IDS2017, Packet Capture (PCAP), Machine Learning, Data Preprocessing, Feature Selection, Logistic Regression, Decision Tree, Random Forest, Gradient Boosting, LightGBM, AdaBoost, Bagging Classifier, Model Evaluation, Network Security Genetic Testing, Hereditary Disorders, Early Detection, Prevention, Machine Learning, SMOTE, Auto_ViML, RandomForestClassifier, LIME, Data Preprocessing, Model Interpretability, Healthcare, Predictive Models, Genetic Data, Automated Systems, Personalized Treatment, Clinical Application, Outlier Removal, Imputation, Hyper-parameter Tuning.*

INTRODUCTION

This makes hereditary disorders a major difficulty in the contemporary context of medicine, not to mention the genetic factors which play an important role in the development of the respective disease. Such illnesses are hereditary which makes them affect subsequent generations of patients and their families significantly. These disorders are all known to have early stages that once diagnosed should ideally be treated to minimize the severity of the impacts they have on the sufferer's life; this early detection and prevention is important and can greatly improve the patient's quality of life. However, due to the large amount of data present in genes and modalities of development and different subtypes of disorders which are very close to each other differentiation at the early stage can be a very complicated process.

An early diagnosis is viable with the help of genetic testing, however, the analysis of the genetic information is an issue. There are incredibly large numbers of records stemming from genetic tests, thus technologies performing complex data analysis are needed in a bid to establish correlations within them. The customary methods fail to deliver in addressing this volume and varieties of data, and there are frequent false positive results or overlooked diagnosis. To address this shortcoming, this research proposal seeks to use recent machine learning strategies to improve the genetic tests in the hopes of upgrading the detection methods for early examination.

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Incorporating SMOTE for balancing the data, Auto_ViML for automated model selection, and LIME for model interpretation, our objective is to design reliable prediction models that can be easily implemented in clinical practice. These models have specific objectives of assisting in the identification of descendent hereditary diseases and are effective tools in the hands of health care givers to enable them accurately and expeditiously analyze genetic information. The purpose of this paper is to develop an extensive structure to solve the main issues related to genetic testing for integrating these innovative approaches into daily clinical practices and enhancing the quality of patients' treatment.

1. RELATED WORK

Prior studies in the health care management for hereditary disorders mostly concentrated on the detection of certain gene linkages of different diseases. From these components of studies, it has been ascertained that the machine learning models are well-equipped to analyze genetic information in comprehending the genomics of diseases. However, there are still many difficulties, especially regarding the explainability of the model and the situation when the dataset is imbalanced. All these genetic studies have sample class problem, in that the number of samples where the person has the disorder is far much lesser to the total number of samples that do not contain the disorder and this distorts the results of the predictive models.

For these reasons, methods like SMOTE has been used to propose a solution to the problem of class imbalance, which helps train in strengthening the minority classes. This has resulted into enhanced ways of modeling and sharpening the ability to make accurate and more reliable predictions. Moreover, techniques such as LIME that has been created to explain the decisions of a model have been ufurther enabled to improve the interpretability of complex machine learning models. Thus, the LIME approach facilitates interpreting the result of the model and ensures that healthcare professionals trust the output of the model.

The present work takes these investigations as its starting point and combines these techniques into a single framework. Thus, using Auto_ViML to improve the efficiency of model creation, we would like to improve the effectiveness of the genetic testing. This combined strategy not only helps to solve the problems of imbalance classes and model explainability but also makes the process of constructing models more efficient and easy for applying into the clinical practice. In addition to that, our research contributes to the literature by establishing the workability of integrating those approaches in the creation of more accurate and explicable models for use in medical decision-making.

2. METHODOLOGY

This approach of establishing the methodology for this study has the following key steps to arrive at the right predictive models of hereditary disorders. First, there is the data cleaning step that includes the encoding of the categorical target variables and the management of the missing values according to the skewness. This makes the dataset complete and prepared for analysis There is no last date to apply this technique, and the process is systematic. Z-scores are calculated and this help in identifying and getting rid of any outliers that there may be hence employing the best data quality. The data preprocessing steps described above are very important in the process of preparing the data for model construction.

After preprocessing, there is further pre-processing of the data set by removal of useless variables that will not be beneficial in the model development process. It is then separately tested by organizing the datasets into records for targets and subsequently testing them by assigning test and training parts. To countermeasures the challenge of class imbalance, SMOTE is used which balances the classes in order to train the models from datasets that reflect all classes. This step is important in order to increase the efficiency of the predictive models and make them more accurate in cases when some of the genetic disorders are rather rare.

Auto_ViML is implemented for auto molding where hyper parameters adjustments and features are selected optimizing the model accuracy. This tool optimizes the model construction phase and lets one compare a range of algorithms and parameter tweaked to find the best-fit model for each of the target test. Last but not the least, another RandomForestClassifier is trained and then interpreted using LIME for accurate explanations of the classifier's predictions. The sequence of automatic model creation and the interpretability analysis guarantees that the built models are reliable and easily explainable, thus their usage in real clinical practice.

3. DATA COLLECTION

It is therefore important to gather information which is done in form of assembling a sundry data set of the various genetic disorder tests. It is obtained from a large scale database which contains patient information demographics, results of laboratory tests as well as genetic data therefore the type of information available is diverse. This richness of the data increases the external validity of the predictive models derived in this work. Concerning data quality, the methods of imputation are used to solve the problem of missing values, while the systematic outlier elimination increases the quality of the dataset.

Despite the dataset not having many missing values, the preprocessing step of imputation ensures that the task involves working on a very complete dataset generated by transforming categories into labels. Outliers are removed with the help of z-scores among other methods to ensure the quality of data. The cleaned dataset is useful in the training and evaluation process that is necessary in creating

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predictors for hereditary diseases. In this setting, the qualities of our data, whether relevant or complete, would permit the training of dependable and versatile models.

Updates to the data on patients and the external environment therefore have to be gathered and incorporated in the models on a continuous basis in order to ensure that the models are accurate and relevant. The new data is incorporated to the old data and this feature enables the improvements and updating of the models as the new data is obtained. This continuous loop makes the developed predictive models relevant and useful to detect the genetic disorders, hence, helping in early detection and much-required personalized treatment. It is especially the emphasis on high quality of the data collected and on an improvement of the data quality on a daily basis which plays a key role because these are the conditions for the long-term stability and the practicability of the models in hospital environments.

4. MODEL SELECTION

Logistic Hence, the model selection criteria for this study are parsimony, accuracy, and efficiency. Auto_ViML is selected in view of its capacity to automate the model selection process; this will facilitate the possibility of comparing the performance of more than one algorithm and different hyper-parameter settings. This automated way allows choosing the proper model to perform the target test effectively and with high speed. Auto_ViML thus allows for simplification of model development such that it can be achieved within the context of clinical environment known to have serious time and resources constrains.

The process of model selection for the model based on the algorithm and the configuration of hyperparamenters that tend to perform well. This way the chosen models are not only precise but also have a good computational complexity. Auto_ViML helps in this by reducing the time it takes for the model selection process thus giving the researcher other enabling factors to concentrate on. Through Auto_ViML, the best models will be chosen for predicting the genetic disorders.

Furthermore, RandomForestClassifier is applied to improve interpretability with the help of LIME, which helps to show the user an understandable view of the model's decision. Such approach of using both the automated as well as interpretable modeling maintains the model accuracy with the ability to explain them. With these, superior machine learning techniques, they should be able to design models that are accurate yet explainable, thus adding more credibility in the practice of clinical medicine. It is necessary to mention that the given dual emphasis on the performance of the model on the one hand, and its interpretability on the other is the key to the usefulness of the models in medical practice.

5. IMPLEMENTATION

Data Preparation: To load the dataset, a program implemented using the Pandas library is used; in this way, all the data relevant to the test results connected with genetic disorders, patient demographics, and all genetic markers are taken into account. Some of the processes that are considered in the preprocessing stage include the one that deals with categorical data where label encoding is employed so that they can be used when developing the models. Also, dealing with missing values, the strategy involves imputing values using the mean for positively skewed features, and median for the negatively skewed features. This step makes the dataset ready and complete for analysis before proceeding to the next step.

Outlier Detection and Handling: In the case of the numerical features, z-scores are applied to investigate the presence of outliers which is determined as:

$$z - score = \frac{x - mean}{standard\ deviation}$$

Any features which have a z-score greater than 3 are then omitted from the dataset to remove any low quality data from the dataset. This step is important in order to prevent the situation when some out-of-range values will significantly skew the model training. The process of outliers can bring the data used to build predictive models back to reality and, therefore, increase their credibility.

Feature Engineering: Numeric variables are remained almost intact for use as they are kept in a very good condition for machine learning algorithms. Ordinary categorical variables are subjected to Label Encoding for insight compatibility with the various machine learning models. Techniques of feature selection are used to select only those features, which I important for learning the model. This step aids in the simplification of the given dataset or set of data and increases the efficiency of the generated predictive invents as all features of importance are considered.

Model Selection: The following classification-algorithms are used for diagnosing the hereditary disorders: logistic regression, decision tree, random forest, gradient boosting, LightGBM, AdaBoost, and bagging. Auto_ViML is used to reduce the time of model selection where the user inputs in hyper-parameter tuning and feature selection have to be made to come up with the best model for every target test. This approach makes sure that the models to be created are based on the training dataset, and their accuracy is enhanced by more complex techniques.

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Model Evaluation: To assess performance of each of the models a number of Statistical parameters such as Accuracy, Precision, Recall, F-Score, MCC and Kappa statistics are used. Confusion matrices and receiver operating characteristic curves are also applied for evaluating the results of the models. These metrics give a clear assessment of how each of the models performed in predicting Genetic disorders while taking into consideration the efficiencies of both the true positively and true negatively. For example:

$$Precision = \frac{TP}{TP + FP}$$

$$Recall = \frac{TN}{TN + FN}$$

$$Accuracy = \frac{TP + TN}{TP + TN + FP + FN}$$

TP=True Positive
TN=True Negative
FP=False positive
FN=False Negative
Where TP stands for True Positive, TN for True Negative, FP for False Positive, and FN for False Negative.

Comparison and Selection: The findings of all the developed models are displayed in bar graphs and thus assist in comparing the various models developed. The performance metrics of the models are identified through this visualization to establish which model is most appropriate for hereditary disorders predictions. In this way, all the models will be compared together, and we will in turn understand which of the models, if not all, returns the best value of accuracy, precision, recall, and other metrics necessary for the clinical application of the model.

6. DATA COLLECTION

Data Collection

Following on the next lines of code the script introduces the required packages and libraries.It then uses pandas to read the CSV file named “Payload_data_UNSW. csv” into database then stores it in the data frame.

Data Inspection and Preprocessing

There is a limitation in the sense that the script is used to confirm data that has been loaded for further analysis by printing the names of the columns to be analyzed, checking the existence of missing values, determining the type of data present in each column, and providing descriptive statistics. In case the data fed into the function has been categorized on a column basis, it gives a print of the frequency of each category. It first decides upon the LabelEncoder which is an encoding to convert categorical variables into numbers for purposes of the machine learning algorithms.

Outlier Detection and Removal

For numeric fields, z-scores are calculated to flag out-share cases. In case the median of a numerical column is greater than the mean of the same column plus two times the standard error of the mean, the column name becomes part of the vector X. Next the script computes Threshold variable using 2 standard deviations upper and lower bounds of deterrence These bounds determine which rows have been considered to be in outlier values and therefore, they are eliminated.

Feature Selection

Filtering is made on the basis of certain criteria which measure the relationship between each feature and the target or ‘label’. The feature selection process involves defining the independent variables as the predictor matrix x, and the dependent variable, represented as the target column y.

Train-Test Split

In order to create the train and test sets of the data, I use the tool ‘train_test_split’ from the sklearn library. model_selection.

Model Training and Evaluation

There are seven classifiers as follows: Logistic Regression, Decision Tree, Random Forest, AdaBoost, Gradient Boosting, Bagging, and LightGBM, applied on the training dataset. The score method is used to assess each classifier’s accuracy over the test data.

Summary

The script does a sweeping data exploration, which includes pretreatment measures such as inspection of data, handling of missing data, detection of outliers and selectivity of features. Here it depends on multiple models of machine learning and examines the results on unknown test set. Finally, as we can see in the given script, it offers a framework for the construction and validation of machine learning solutions for the classification of payload data.

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7. RESULT

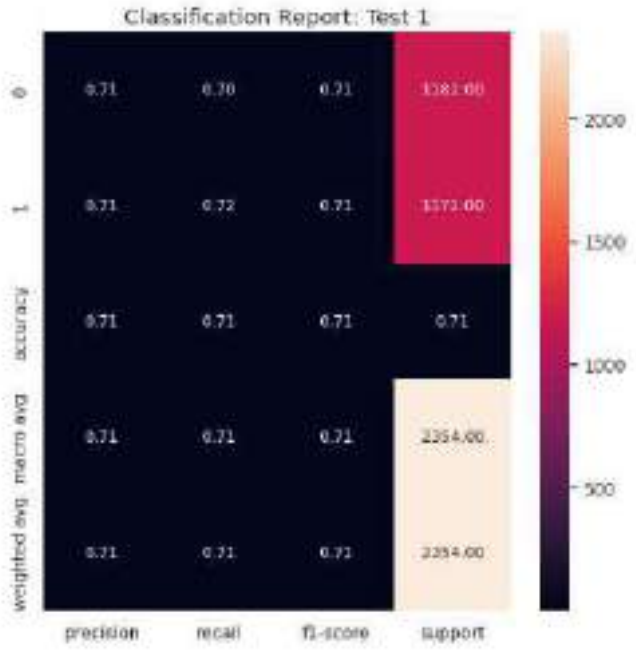


Fig 1.0 Classification Report: Test 1

The first graph is heatmap for classification report and the second graph is confusion matrix for the classification model. The x-axis lists the metrics: as the x-axis shows the measures namely precision, recall, and f1-score, the y-axis indicates the different labels/classes namely 0 and 1 as well as the overall performances such as accuracy, macro average, and weighted average. The numbers, or values, in the heatmap cells are the scores of the classes and the metrics they are related to. For instance, the precision of class 0 is equal 0. For class 0, Out-Of-Bag accuracy is equal to 71, meaning that 71% of instances which were assigned to class 0 are correctly classified. Also, the recall of class 1 is 0. Particularly, its accuracy of the involved class 1 instances can be calculated at 0. 72, meaning that 72% of the real class 1 instances will be correctly classified by the model.

This model's classification report gives an overall performance analysis of the model and its ability to classify the various items. The accuracy value, 0. That is, out of the total number of predictions, the formula, 71, shows that 71 percent are accurate. The macro average which is the average of many to one proportion of precision, recall, f1-score excluding the issue on class imbalance is 0. 71. The overall, which is computed based on smart support (number of true instances in each class), is also equal to the same value which in turn reveals balanced measures across the classes. Class 0 delta is 1182, class 1 is 1172, which means that the dataset is quite balanced, which strengthens the confidence in the chosen weighted accuracy metric.

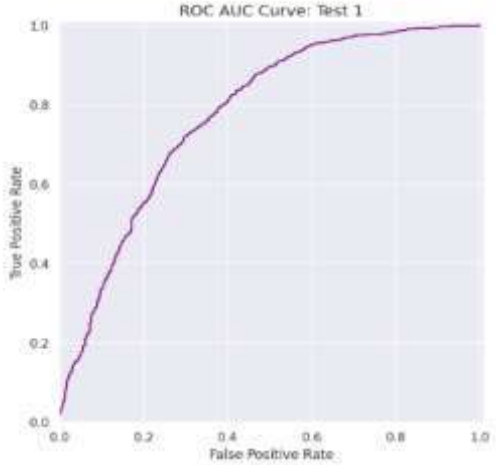
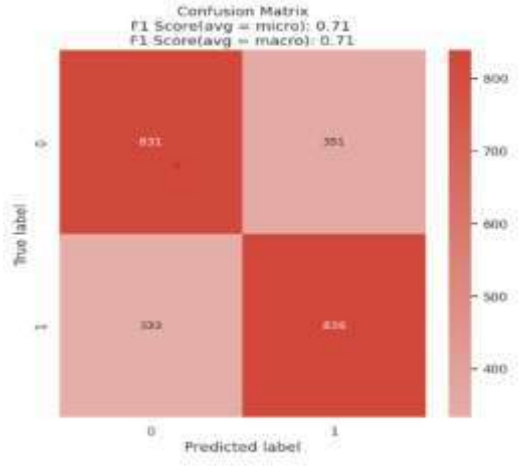


Fig 2.0 ROC Curve

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The second one is a Receiver Operating Characteristic (ROC) curve that shows the model's accuracy with regards to the classification under different threshold levels in terms of the True positive rate and False positive rate. This curve gives measures on how the model is able to classify samples between the positive and negative classes. The closer the curve is to the top left section the better the model performs, that's why the area intersects by 0,5. In this case, the ROC curve is quite favorable, and the position of the model when comparing it with other models, is close to the value of 1, as a result of the value of the area under the curve (AUC). 0. This in turns suggest that the model has high level of accuracy which allows for the differentiation of the two classes.

ROC is good for comparison of different models or for choosing threshold in the task where sensitivity and specificity is important. The nature of the curve shows how the true positive rates increase or decrease relating the false positive rate in order to evaluate the model's performance as it strives to achieve increased true positive and reduced false positives. An ideal model that has AUC at one point 1. Hence, any AUC of 0 is acceptable to represent the best or, in terms of classification, an AUC of 0 represents an A. 5 indicate no discriminative ability, which is equivalent to pure guess work

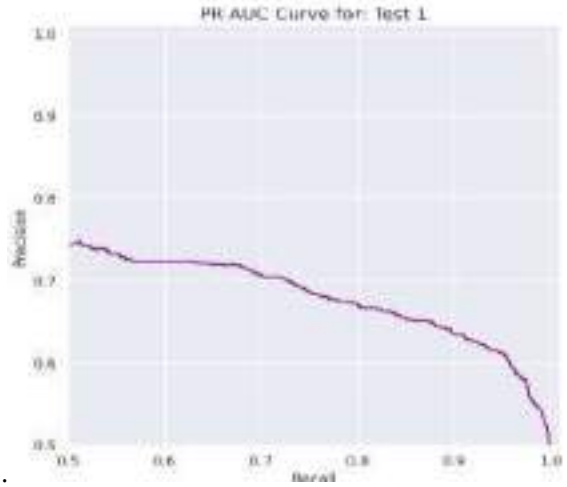


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Fig 3.0 Confusion Matrix together with F1 Scores.

This is a matrix representing the confusion of a model with binary classification. This format has true labels in the vertical direction and the predicted labels in the horizontal axis with the values being the number of instances of true and predicted labels. By using the matrix, it can also be observed that the model got 831 instances wrongly classified as negative and 839 instances wrongly classified as positive. In the same regard, it incorrectly categorized 351 samples of negative class as belonging to a positive class, and 333 positive samples as belonging to a negative class. These misclassifications are essential when it comes to evaluating the model's accuracy, especially its precision and recall for each of the classes.

The F1 scores are also provided, and, similar to the case of the confusion matrix, these are the scores with the micro and macro average being 0. 71. The micro average F1 score calculates the total of true positives, false negatives, and false positives of all the classes to offer a single score on the performance. The macro average F1 score computes the F1 score of the classifier for every class individually to arrive at an average, where all classes are given importance at par. Both scores are equal that is at 0. It is 71 suggesting that the performance does not favor any of the classes.



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Fig 4.0 PR AUC Curve

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This one is an Area Under Precision-Recall (PR) curve that shows the Precision & Recall at various thresholds of the classification. Recall and precision are used as an x and y axis of a curve respectively. The curve is useful in indicating how the model's precision and recall metrics hold up when the threshold levels are adjusted. In this graph, the PR starts at nearly 1. 0 of precision and then falls as the recall increases. 8 and then falls as the value of recall rises implying that the model is most appropriate for precision at low recall and the reverse is true.

The area under the PR curve is a single scalar that gives an estimate of the performance of the classifier over all the threshold levels. Higher value of AUC represents better performance as the number of true positive is more with least number of true negative. The graph reveals that there's a negative correlation between the precision and the recall where the lower line depict the impact of the trade-off between the two as the precision declines to enhance the recall. This analysed that the designed model's precision is comparatively higher, when recall counts is comparatively lower, which means it can conveniently and properly identify the related instance; however, when it tries to yield better actual positive consequences (higher recall), it loses its capability of precision, suggesting it appropriately classifies more and more irrelevant instances.

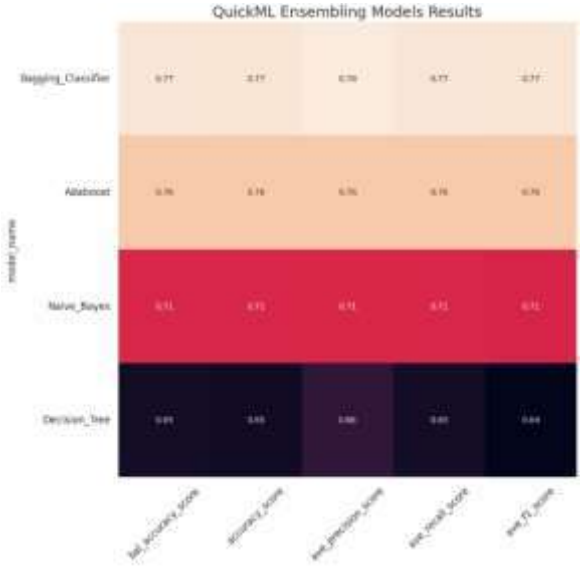


Fig 5.0 The Performance Heatmap

This graph is a heatmap that summarizes the performance of various machine learning models: From the list of classifiers, it introduced Bagging Classifier, AdaBoost Classifier, Naive Bayes, and Decision Tree. Here are the metrics that are depicted: balanced accuracy score, accuracy score, average precision recurring, average recall recurring and average F1 score. Thus, looking at the heatmap one can conclude that the Bagging Classifier has the highest overall accuracy with the scores of 0. 77 on most of the indices, which can be deemed as highly reliable and sustainable. AdaBoost is only slightly lower, gaining a score of 0. 76, Which shows that using combination of learners is efficient when implementing ensemble learning.

Nevertheless, Naive Bayes and Decision Tree classifiers are less efficient than that as they take relatively more time. The total scores of Naive Bayes for both classes are 0. 71, which Decision Tree has the worst performance depicted by presented scores of approximately 0. 65. Based on the findings presented above, it can be ascertained that methods that work in an ensemble such as Bagging and AdaBoost superior the single classifiers such as Naive Bayes and Decision Trees. The heatmap ensures that one is able to compare easily the models to determine which ones are most suitable for this given classification problem. Such a comparison is crucial when deciding on which model to use in production from a performance evaluation point of view.

8. CONCLUSION

In conclusion the work illustrates the approach to the problem of genetic disorders dataset which comprises data preprocessing, dealing with imbalanced data, model construction and model explanation. I also first had to encode the categorical features, Impute. Basic based on skewness and deleting outliers to have clean data. The above procedure is very important in ensuring that the models to be used perform as required and provide accurate results. In this respect, filtering away of outliers and the dealing of missing values are crucial in that they assist in data purification, and thus guarantee the models developed from the given data are both accurate and transportable.

To each testing target, the data was divided into the training and the testing datasets after which SMOTE technique was used to address the issue of imbalance, which is a crucial procedure when dealing with minority classes. AutoVIML was employed for constructing the models for predicting the property price automatically with feature selection and hyperparameters tuning for obtaining high accuracy. Also, a RandomForestClassifier was fit, and for interpretation, LIME is used which helps in getting features

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that the model focuses on while making a decision. This is significant in the aspect of model trust due to the nature of the scores provided, which pertain to probabilities of genetic disorders, among others. This makes sure that the analysis is realized with the correct value and it is also understandable and useful.

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CLASSICAL HODGKIN LYMPHOMA: FROM PAST TO FUTURE-A COMPREHENSIVE REVIEW OF PATHOPHYSIOLOGY AND THERAPEUTIC ADVANCES

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ABSTRACT

Lymphatic system cancers include Hodgkin lymphoma. The immune system's role in warding off sickness and germs consists of the lymphatic system. Hodgkin lymphoma develops when normally functioning lymphatic cells transform and proliferate uncontrollably. The annual incidence of Hodgkin lymphoma is two to three cases per one hundred thousand individuals. Nodular lymphocyte predominance (NLPHL) and classical Hodgkin lymphoma (cHL) are the two subtypes of Hodgkin lymphoma that are distinguished based on immunohistochemically and visual characteristics. Upon first diagnosis, the majority of individuals with Hodgkin's lymphoma will have supradiaphragmatic lymphadenopathy. Inguinal lymph node involvement is infrequent, however, patients commonly report lymph node involvement in the neck, anterior mediastinal, supraclavicular, and axillary areas. Chemotherapy and radiation therapy are the fundamental components of treatment for classical Hodgkin lymphoma (cHL), although in certain instances of slow-growing non-Hodgkin lymphoma, monitoring may be considered a viable approach.

KEYWORDS: *Hodgkin lymphoma, Epstein-Barr virus, Nodular lymphocyte predominance, Immunotherapy, Graft-versus-host disease.*

INTRODUCTION

Approximately 8,540 new cases of Hodgkin lymphoma (HL) are reported annually in the United States. The condition exhibits a bimodal distribution, wherein the frequency of occurrence is higher among individuals aged 55 years and above compared to younger individuals. The cause of HL is currently unidentified, and there are presently no identified risk factors associated with the onset of the disorder. HL has been associated with various risk factors, including viral exposure, a weakened immune system, or genetic vulnerability. Individuals diagnosed with HL have a significantly increased likelihood of transmitting the disease to their siblings of the same gender, which is ten times greater than the general population. Furthermore, the likelihood of a patient developing HL is considerably greater if they have a monozygotic twin compared to their dizygotic twin sister. Research indicates that an atypical immune response to infection may contribute to the development of HL. However, the presence of familial characteristics suggests a possible genetic cause. The presence of the EBV genome was detected in HL tumor samples. Epidemiological and serological research have established a correlation between the Epstein-Barr virus (EBV) and human lung disease (HL). However, several viral illnesses that occur during childhood, such as chickenpox, measles, mumps, rubella, and pertussis, actually decrease the likelihood of getting HL [1]. They may also offer a certain level of security. Moreover, there exists a correlation between HIV infection and hearing loss (HL); the likelihood of experiencing HL is significantly greater in those who are HIV-positive compared to the overall population. Individuals with compromised immune systems, namely those who are afflicted with HIV, experience a less favorable outlook following the initiation of HL treatment. Moreover, at initial detection, the disease typically exhibits advanced progression and may be seen in atypical locations. There has been a substantial rise in the number of patients who have achieved a cure in the past four decades due to tremendous progress in combination chemotherapy, targeted immunotherapy, and radiation therapy. Currently, almost 80% of persons under 60 who have been newly diagnosed have a high likelihood of achieving complete recovery.[2] Age, gender, and geographic location are factors that influence the frequency of Hodgkin lymphoma. Hodgkin lymphoma exhibits a higher prevalence in males, teenagers, and young adults, as well as individuals with a previous Epstein-Barr virus infection, HIV/AIDS, autoimmune disorders, exposure to environmental factors, smoking habits, and a family history of the disease. Furthermore, research demonstrated that variables such as the number of individuals in a family and the socioeconomic condition of individuals had an impact on the occurrence of Hodgkin lymphoma. Before implementing

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targeted preventive measures in individual countries, it is essential to evaluate the worldwide distribution pattern, risk factors, and historical trends of Hodgkin lymphoma. This is necessary because the epidemiology of the illness varies and may have undergone changes over time.[1, 3]

EPIDEMIOLOGY

The annual incidence of Hodgkin lymphoma is approximately 2 to 3 cases per 100,000 individuals. Aside from the primary age peak shown in those aged 30 to 40, there is a secondary peak observed in individuals aged 60 and above. Hodgkin's lymphoma can arise as a result of several advantageous conditions. The remarkably high occurrence of identical twins offers compelling evidence for a significant genetic factor in HL. A limited range of genetic variations in genes that regulate immune system function have been linked to a higher vulnerability to horizontal gene loss. Approximately 45% of persons diagnosed with Hodgkin's lymphoma (HL) have positive results on Epstein-Barr virus (EBV) tests. An attribute of the Epstein-Barr virus subtype, referred to as nodular sclerosing, is the occasional appearance of the internal genome. Ultimately, it appears that in certain individuals, a past Epstein-Barr virus (EBV) infection that has reached its expiration date can initiate the onset of Hodgkin's lymphoma (HL), however, it is not the sole factor contributing to HL. HIV-positive individuals often have a heightened likelihood of acquiring Hodgkin's lymphoma (HL).[4] The introduction of Highly Active Anti-Retroviral Therapy (HAART) has led to an increase in Hodgkin's lymphoma (HL) cases associated with HIV. This increase highlights the importance of the inflammatory environment in enhancing the immune system's ability to fight the disease. An individual's susceptibility to sickness can be influenced by genetic predisposition, exposure to viruses, and lifestyle choices made within specific socioeconomic groups.[5]

Pathophysiology

Neoplastic cells of various types can be found in both the conventional and NLP-HL varieties of Hodgkin lymphoma. Reed-Sternberg (RS) cells, which are large cancer cells, possess two symmetrical nuclei that bear a resemblance to the eyes of an owl. These nuclei are observed in distinction to the surrounding reactive cells. The presence of the Reed-Sternberg cell implies a characteristic instance of Hodgkin's lymphoma. Germinal center B cells harboring mutations in the IgH-variable region segment are employed for the generation of RS cells. Reactive cells secrete cytokines, including interleukin-5 (IL-5) and transforming growth factor-beta (TGF-beta), to attract other cells. An RS cell is typically characterized by aneuploidy and the absence of a persistent cytogenetic abnormality. According to the existing evidence, most of the isolated RS cells exhibited clonal rearrangement of Ig genes. [6] In immunohistochemistry, RS cells exhibit positive staining for CD30 and CD15, but CD20 and CD45 are usually negative. Conversely, Neoplastic NLP-HL cells exclusively display positive staining for CD20 and CD45. RS cells commonly express PAX5, CD25, HLA-DR, ICAM-1, Fascin, CD95 (apo-1/fas), TRAF1, CD40, and CD86, in addition to CD15 and CD30. RS cells encompass several types, such as lacunar, mummified, and Hodgkin cells. Hodgkin cells are the components of mononuclear RS-cell variations. Mummified cells exhibit a contracted cytoplasm and a reddish nucleus with indistinct chromatin. Lacunar cells exhibit nuclei with many lobes, abundant pale cytoplasm, and tiny nucleoli. During tissue fixation and sectioning, the cytoplasm typically undergoes contraction, resulting in the formation of a lacune-like region surrounding the nucleus.[7]

Lymphocytic and histiocytic cells, often known as "popcorn cells" or LP cells, are characterized by their greater size and folded multilobulated nuclei. One distinguishing feature of NLP-HL is the presence of these cells. Conversely, the NLP-HL does not possess the usual RS cells. LP cells exhibit smaller nuclei and more basophilic nucleoli when compared to RS cells. Only isolated single LP cells have clonally altered immunoglobulin genes. LP cells are characterised by the positive expression of C020, CD45, EMA, CD79a, CD75, BCL6, BOB.1, OCT2, and J chains.[8]

B-cell lymphoma arises in the germinal center, which lacks the characteristic features of B-cells. Hypermutated immunoglobulin genes in human RSV cells exhibit chromosomal rearrangements. These genes are non-functional and do not produce the B-cell receptor on the cell surface. In normal circumstances, this would induce apoptosis in B cells. However, in Hodgkin's lymphoma, it seems that other oncogenic pathways have hindered this process.

Aside from ongoing intracellular growth and survival signals, HRS cells also rely on a specific cellular milieu known as the tumor microenvironment (TME). The majority of Hodgkin's lymphoma (HL) lesions consist of Hodgkin and Reed-Sternberg (HRS) cells. However, HRS cells constitute a small proportion of the cells present in malignant tumors. The HL microenvironment consists of tumor-associated macrophages, mast cells, eosinophils, lymphocytes, granulocytes, and fibroblasts. The histological subtype of classical Hodgkin lymphoma (cHL) affects the number of immune cells.[9] The development of innovative therapeutic options for HL has been made possible by the progress in our understanding of its biology. This progress has been achieved by enhancing our understanding of how HRS cells hinder natural killer (NK) and T-cell-mediated antitumoral immune responses.

Genomic examinations of HRS cells have revealed that the changes in the way these cells interact with the inflammatory environment are primarily due to genetic abnormalities. Antigen presentation can be impeded by downregulation, loss-of-function mutations in B2M, or translocations that decrease the quantity of MHC class I or II presentations on the HRS surface due to CIITA. In addition, HRS cells frequently exhibit amplification of genes on chromosome 9p24.1 that encode the ligands PDL1 and PDL2.

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These ligands are receptors involved in programmed cell death. The interaction between PDL1/2 and PD1 is believed to be a crucial process in the development of T-cell exhaustion. The aberrant production of MICA by HRS cells may hinder the antitumoral immune response mediated by NK cells.[10]

The specific mechanisms by which HRS cells interact with their inflammatory environment in diverse ways are still not fully understood. The research conducted using multiplex immunofluorescence and digital image analysis reveals that HRS cells primarily interact with nearby PD1+CD4+ T cells and PDL1+ macrophages, while the presence of CD8+ T cells near HRS cells is infrequent. Mass cytometric analysis has validated that classical Hodgkin lymphoma (cHL) necessitates an immunosuppressive, Th1-polarized setting with a predominance of CD4+T cells.[11]

CLASSIFICATION

Two subtypes of Hodgkin lymphoma can be differentiated based on immunohistochemical and visual characteristics: Nodular lymphocyte predominance (NLPHL) and classical Hodgkin lymphoma (cHL). Although more than 90% of cases are classical Hodgkin lymphoma (cHL), nodular lymphocyte-predominant Hodgkin lymphoma (LPHL) often has a gradual growth pattern but can also behave aggressively, like a tumor. This study focuses on the four histologic subtypes of classical Hodgkin lymphoma (cHL), which are distinguished based on their morphology, the quantity of Hodgkin and Reed-Sternberg (HRS) cells, and the level of background infiltration. Hodgkin Reed-Sternberg (HRS) cells, which are cancerous, have a distinct immunophenotypic profile characterized by the presence of CD15 + and CD30 +, and the absence of CD45 −. These cells can be present in all subtypes of classical Hodgkin lymphoma (cHL).[10,12]

Nodular Sclerosis

Nodular sclerosis classical Hodgkin lymphoma (NSCHL) is characterized by the presence of neoplastic lacunar-type HRS cells surrounded by a band-forming sclerosis inflammatory background. Classical Hodgkin lymphoma is predominantly caused by NSCHL in approximately 70% of cases in wealthy nations. Approximately 80% of cases exhibit mediastinal adenopathy, and nodes larger than 10 cm in diameter affect around 50% of patients. When compared to other forms of cH, NSCHL often has a more favorable prognosis and is less frequently associated with the Epstein-Barr virus.[13]

Mixed Cellularity

Differential cellularity refers to the analysis of the different types of cells present in a sample.
MCCHL accounts for around 20-25% of cHL cases in the United States. This particular subtype is more common among individuals who are HIV-positive and reside in socioeconomically deprived settings. There is an absence of sclerosing fibrosis, and the HRS cells are scattered throughout a diverse range of mixed inflammatory tissue. Around 75% of individuals exhibit Epstein-Barr encoded latent membrane protein 1 (LMP1) and EBV small nuclear RNA transcripts (EBER), a prevalence that is notably higher than that of nodular sclerosing cHL.[14]

Lymphocyte Rich

Approximately 5 percent of cases correspond to classical Hodgkin lymphoma (cHL). Lymphocyte-rich classical Hodgkin lymphoma (LRCHL) contains small lymphocytes and occasional Hodgkin Reed-Sternberg (HRS) cells but lacks neutrophils and eosinophils. The specimens in question display a high degree of cellularity or the existence of nodules. Early-stage illness in individuals is typically characterized by peripheral adenopathy without considerable mediastinal involvement. Therapeutic failure is rare when using modern combination chemotherapy regimens, as they often result in favorable therapeutic outcomes.[15]

Lymphocyte Depleted

Lymphocyte-depleted classical Hodgkin lymphoma (LDCHL), the most uncommon kind of cHL, impacts less than 1% of individuals in affluent countries. Identifying the reactive inflammatory infiltrate in tumor tissues is difficult, even when HRS cells are present. When comparing other subtypes of classical Hodgkin lymphoma (cHL) to HIV infection, the clinical progression is more severe and frequently happens in conjunction with it. [16]

Overall, the outlook for patients with NSCHL is considerably more favorable compared to those with MCCHL or LDCHL. Conversely, individuals diagnosed with LRCHL had the highest likelihood of recovery. Aside from subtyping, there exist alternative grading methods that possess predictive capabilities about outcomes, however, their utilization is infrequent. These strategies take into account the characteristics of the tumor, such as the extent of infiltration by cancerous HRS cells, the presence of eosinophilia, and the depletion of lymphocytes. [17,18]

DIAGNOSIS

The majority of individuals diagnosed with Hodgkin's lymphoma will exhibit supradiaphragmatic lymphadenopathy upon initial diagnosis. While the occurrence of inguinal lymph node involvement is uncommon, patients often experience involvement of the

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neck, anterior mediastinal, supraclavicular, and axillary lymph nodes. Approximately one-third of patients experience systemic symptoms, such as fever, night sweats, and weight loss, whereas a larger number of patients suffer from chronic pruritis. Hodgkin's lymphoma (HL) typically originates in clusters of adjacent lymph nodes, but it can infiltrate or metastasize to organs beyond the lymph nodes via the bloodstream. The lungs, liver, bone marrow, and spleen are the extranodal regions that are most frequently affected. A biopsy is the only definitive test for confirming the existence of HL. Fine needle aspiration and core needle biopsies are insufficient methods for obtaining a correct diagnosis due to their inability to adequately capture the intricate structure of the lymph nodes. Due to the relatively low frequency of cancer cells in Hodgkin's lymphoma (HL), an inadequate biopsy sample may not include malignant cells. To establish the diagnosis, it is necessary to locate the malignant Reed-Sternberg cell, which originates from the B-cells in the follicular core. This cell must be present in the appropriate cellular milieu, which comprises eosinophils, histiocytic cells, and normal reactive lymphocytes.[19] Hemolymphoid tumors (HL) are classified into two primary categories by the World Health Organisation: classical HL, which is the more frequently diagnosed type, and nodular lymphocyte predominance HL, which is the less prevalent form. The term "clinical HL" encompasses a wide range of HL cases, including lymphocyte-rich HL, mixed cellularity, lymphocyte depletion, and nodular sclerosis. Classical Hodgkin lymphoma (HL) and nodular lymphocyte-predominant HL exhibit significant differences in terms of their biology and clinical appearance. Moreover, there is a strong correlation between nodular lymphocyte-predominant Hodgkin lymphoma (HL) and big B-cell lymphoma, characterized by a significant abundance of T cells and histiocytes. The Clinical Advisory Committee of the International Consensus Classification of Mature Lymphoid Neoplasms has recently determined that a new terminology is necessary to accurately characterize this specific type of Hodgkin's Lymphoma. A proposal was made to rename it as "Nodular lymphocyte predominant B-cell lymphoma (NLPBL)". The extent of available evidence for this is currently uncertain.[20, 21]

TREATMENT

Chemotherapy and radiation therapy are the primary therapeutic options for classical Hodgkin lymphoma (cHL). In certain instances of non-Hodgkin lymphoma that progresses slowly, monitoring may be a viable alternative. Before the advent of combination chemotherapy, the survival rate for individuals with this malignant disease was less than 10% after five years. The overall rates of survival have risen due to advancements in radiation and chemotherapy, as well as a deeper comprehension of cancer's biology. The exceptional treatability of classical Hodgkin lymphoma (cHL) results in a highly positive 5-year relative survival rate for patients aged 0 to 19. The survival rate for individuals diagnosed between the ages of 20 and 64 is 96.4%, whereas for those diagnosed at 65 and older, it is 89.8%.[22,23]

Since the early 1900s, radiation therapy has been employed as a treatment for Hodgkin lymphoma, also known as Hodgkin's disease. For a long time, the mechanisms of transmission, as well as the electromagnetic fields and radiation levels necessary to shift from a palliative care approach to a potentially curative one, were not comprehensively understood. Stanford University's creation of the high-energy linear accelerator in the 1950s enabled more exact dosage distribution and the utilization of more accurate fields. Due to the tendency of classical Hodgkin lymphoma (cHL) to spread to nearby lymph node regions, a viable treatment option is radiation therapy targeting the surrounding areas of the tumor. This method has proven beneficial in treating many patients with early-stage cHL and, in some rare instances, advanced-stage cHL. Extended-field radiation encompassed the regions surrounding the diagnosed sites of illness, whereas involved-field radiation specifically focused on the evident disease locations. "Total nodal irradiation" is a term used to describe the combination of two types of radiation fields: the inverted Y field, which focuses on the abdomen and spleen, and the mantle field, which targets the neck, axillae, mediastinum, and hilar regions. Stanford University research indicates that those who underwent full nodal irradiation experienced an 80% reduction in the likelihood of long-term development. However, there remained a possibility of encountering severe adverse consequences due to radiation exposure. In the era of three-dimensional and PET-directed radiotherapy, medical experts devised involved-site and involved-node radiation fields to mitigate the adverse consequences of radiation exposure.[24]

During the preliminary testing, cytotoxic chemotherapy drugs such as cyclophosphamide, mechlorethamine, and chlorambucil showed promising response rates of 50%. Regrettably, none of these adverse effects endured over the extensive duration of chemotherapy treatments. The introduction of procarbazine and vinca alkaloids greatly facilitated the advancement of combination chemotherapy. The Vincent Devita-led research team at the National Cancer Institute coined the acronym MOPP, which stands for "nitrogen mustard [meclorethamine], vincristine, procarbazine, and prednisone," to describe this specific combination of medications. A total of 81% of persons diagnosed with advanced chronic hemoglobin-related lung illness achieved complete remission within six months following the administration of MOPP treatment. Following a period of four years, during which approximately half of the patients who had achieved a complete response to treatment remained disease-free, the treatment approach shifted from ongoing therapy to a planned goal. [25,26]

Remission was experienced by 96% of participants in both groups. vs to extended-field radiation treatment, the MOPP treatment is a more advantageous option for individuals with Stages IB, IIA, IIB, or IIIA cHL because of its lower relapse rate (13% vs. 35%). Patients who underwent MOPP treatment and received radiation had the highest probability of having a healthy and disease-free life for the expected duration of 10 years. [27]

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Treatment of Pediatric cHL

The intensity of treatment for pediatric chronic hemolytic lymphoma (cHL) varies across North America and Europe, depending on the risk category. The classification of patient risk is essentially determined by characteristics such as cancer stage, severity of disease, and the presence of B symptoms. The staging phase has already established distinct risk categories. The treatment outcomes of juvenile Hodgkin lymphoma patients, as assessed by PET scans, are strongly linked to the radiation dosage in the ongoing COG and European Network investigations. [28] The objective of this strategy is to mitigate the detrimental long-term consequences of radiation therapy in youngsters. Both research groups have adopted highly conformal technologies with reduced radiation volumes to precisely target the most vulnerable locations, aiming to enhance outcomes for high-risk patients. After administering reduced radiation doses, patients receive either standard or intensified chemotherapy treatments. Currently, research is underway to investigate the use of immune-modulating drugs as a response to the possible short-term adverse effects of intensified chemotherapy. [29]

Immunotherapy

Combination chemotherapy is effective in curing most patients with classical Hodgkin lymphoma (cHL). However, for individuals with refractory cHL or cHL that relapses immediately after treatment, immunotherapy has significantly enhanced the outlook. The majority of classical Hodgkin lymphoma (CHL) tumors consist of atypical reactive immune cells, such as lymphocytes, plasma cells, and macrophages, rather than the cancer cells known as Hodgkin Reed Sternberg cells. This characteristic renders these cancers exceptionally distinctive. Neoplastic Hodgkin Reed Sternberg (HRS) cells produce a diverse range of cytokines and chemokines to manipulate their environment and elude the immune system. Tumour immune evasion leads to a reduction in T cell function. The signaling pathway referred to as Programmed death-1 (PD-1)-PD-1 ligand (PD-L1) is a potential mechanism that may be implicated. Cancer cells expressing the PD-1 ligand bind to the PD-1 receptor on T lymphocytes, which hinders the activation and proliferation of T lymphocytes.[30]

Malignant Hodgkin and Reed-Sternberg (HRS) cells exhibit significant upregulation of PD-L1 expression, whereas tumor-infiltrating T cells in classical Hodgkin lymphoma (cHL) display substantially increased levels of PD-1 expression. Furthermore, the presence of Epstein-Barr virus (EBV) infection is responsible for the expression of PD-L1 in classical Hodgkin lymphoma (cHL). 56% of individuals diagnosed with classical Hodgkin lymphoma (cHL) exhibit copy gain, 5% exhibit polysomy, and 36% exhibit chromosomal 9p24.1 amplification. These variations improve the creation and combination of PD-1 ligands through the Janus kinase (JAK)-signal transducer and STAT signaling. Given the multitude of factors involved, it is appropriate to focus on the PD-1/PD-L1 immunological checkpoints for therapeutic purposes. [24]

Nivolumab, a PD-1 antibody, produced a positive response in 87% of patients with advanced chronic hemolytic lymphoma who had received substantial prior treatment. Out of these, 17% achieved a total remission. Out of the individuals in this particular group, 78% experienced a recurrence following autologous stem-cell transplantation, and an additional 78% had a relapse after BV treatment. In addition, the effects endured for an extended duration, with 86% of patients remaining alive after 24 weeks. Out of a total of 80 patients with classical Hodgkin lymphoma (cHL) who were treated with nivolumab, 53 of them showed a positive response that could be detected after completing the whole treatment regimen. Nivolumab demonstrated significant efficacy in reducing cHL tumors while exhibiting a favorable tolerance profile. The predominant adverse effects seen included weariness, dermatitis, and infusion-related responses. [31]

An extensive inquiry was carried out to assess the efficacy of pembrolizumab, a PD-1 inhibitor, in adult patients diagnosed with classical Hodgkin lymphoma (cHL) who had previously been treated with brentuximab vedotin (BV), had undergone an average of four systemic treatments before disease relapse, or had undergone an autologous stem cell transplant. Among the patients, 47% gave incomplete responses, whereas 22% supplied comprehensive answers. The predicted median response time was 11.1 months. [29, 30]

Checkpoint inhibition is associated with extra autoimmune side effects, while standard cytotoxic therapy is associated with toxicities such as nausea, vomiting, and hair loss. The bad results can be attributed to either the augmented migration of CD8 T cells into healthy tissues for cytolysis or the excessive synthesis of cytokines by CD4 T-helper cells. The consequences are caused by an overresponse of T cells. The maculopapular rash is the most often occurring type of skin rash that might occur as a result of immune-mediated adverse effects caused by checkpoint inhibition. There have been documented cases of Sweet's syndrome, toxic epidermal necrolysis, Stevens-Johnson syndrome, and other severe reactions. Individuals diagnosed with classical Hodgkin lymphoma (cHL) have limited access to information. However, it has been observed that approximately 5% of lung cancer patients undergoing PD-1 inhibitor treatment-experienced pneumonia. There is evidence linking the use of immune checkpoint inhibition and the two PD-1 blockers mentioned earlier to instances of fulminant myocarditis. Diarrhea, colitis, and endocrine toxicities such as hypophysitis, hypothyroidism, hyperthyroidism, thyroiditis, and adrenal insufficiency have all been associated with the inhibition of immune checkpoints. Discontinuing the use of anti-PD-1 medicine can significantly decrease the occurrence of major immune-related side

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effects in a therapeutic setting. In severe circumstances, the use of steroids and other immunosuppressive therapies may be necessary. [30]

Despite experiencing clinical improvement, imaging data after undergoing checkpoint inhibitor medication may indicate a deterioration of the condition. False progression or immune-mediated "tumor flare" can occur when patients initiate therapy prematurely. To address this issue in the immunomodulatory therapy of lymphoma, a new set of criteria has been created to evaluate treatment response. An example of a criterion is "indeterminate response," which can be employed to categorize lesions until additional imaging definitively categorizes them as either pseudo-progression or genuine disease progression. [31]

Various sources of donors, such as HLA-haploidentical allo-HCT, have been linked to relapse rates above 40%. However, allogeneic hematopoietic stem cell transplantation (allo-HCT) can potentially provide a cure for refractory or relapsing chronic hemolytic lymphoblastic apathy (cHL). Individuals with a history of allogeneic hematopoietic cell transplantation (allo-HCT) were not included in the initial trials of pembrolizumab and nivolumab for classical Hodgkin lymphoma (cHL) due to concerns that inhibiting PD-1 could potentially exacerbate or induce graft versus host disease (GVHD). A retrospective study was conducted in France to evaluate the safety and effectiveness of nivolumab in twenty patients with classical Hodgkin lymphoma (cHL) who experienced a recurrence after undergoing allogeneic hematopoietic stem cell transplantation (allo-HCT). A remarkable 95% of the comments were addressed, with 42% of them being thorough and elaborate. At the one-year follow-up, neither the overall survival rate nor the median survival rate were achieved or determined.[26]

The administration of the medication had to be discontinued following a single infusion due to the occurrence of graft-versus-host disease (GVHD) in six patients, or 30% of the total, who received nivolumab within one week of the initial dosage. Each of these people had a previous occurrence of acute GVHD. Patients with a prior record of chronic GVHD, but not acute GVHD, were not susceptible to nivolumab-induced GVHD. A separate retrospective study conducted in multiple US centers revealed that 77% of patients exhibited a positive response to the usage of PD-1 blocking. Nevertheless, following the initiation of anti-PD-1 medication, a significant proportion of patients (55%) developed treatment-emergent graft-versus-host disease (GVHD), often occurring after receiving 1-2 doses of checkpoint-blocking therapy. Patients who developed GVHD due to nivolumab treatment had a significantly shorter time interval between receiving allo-HCT and starting nivolumab medication. Unlike those who did not experience GVHD, whose median length varied from 7 to 111 months, the patients in this group had a median duration of 8.5 months (ranging from 2 to 19 months). Although patients undergoing allogeneic hematopoietic cell transplantation (allo-HCT) for recurrent classical Hodgkin lymphoma (cHL) may experience positive effects from PD-1 suppression, there is a potential issue of severe and resistant graft-versus-host disease (GVHD) that can occur unexpectedly. Checkpoint inhibition, a treatment method that is limited by the occurrence of graft-versus-host disease (GVHD), maybe a viable alternative to donor lymphocyte infusion for certain patients with recurrent or refractory classical Hodgkin lymphoma after allogeneic hematopoietic stem cell transplantation (allo-HSCT) who require a tumor response. [28]

The safety of allogeneic hematopoietic stem cell transplantation (allo-HCT) for persons who have recently undergone programmed cell death protein 1 (PD-1) blockade therapy is now a topic of discussion and uncertainty. A retrospective analysis was conducted on 38 lymphoma patients from around the world who had received PD-1 inhibitor therapy before undergoing allo-HCT. The study revealed that there was a cumulative incidence of 23% for grade 2-4 acute GVHD at one year, with a higher rate of grade 3-4 acute GVHD. After one year, 41% of patients were diagnosed with persistent GVHD. Patients who received both a PD-1 inhibitor and a monoclonal antibody targeting CTLA-4 experienced a serious case of graft-versus-host disease (GVHD). Unfortunately, one patient succumbed to grade 4 acute GVHD. Seven individuals developed an uncommon noninfectious feverish illness shortly after receiving a transplant, requiring rigorous treatment with steroids. Prior administration of PD-1 blocking treatment in patients has shown that allogeneic hematopoietic stem cell transplantation (allo-HSCT) is possible. This is supported by a 95% confidence interval (CI) of 89% for overall survival after one year and 76% for progression-free survival after one year (pp. 56-87).[34]

Immunotherapy has significant potential for treating chronic HL due to its outstanding safety record, high response rate, and probable long-term success. In recent years, there has been an investigation into the use of immuno-oncologists in innovative combinations with BV and early treatment programs to address the treatment of cHL patients who have experienced relapse or are unresponsive to chemotherapy. [30]

Allogeneic Stem Cell Transplantation

The scarcity of appropriate donors and the heightened rates of severe sickness and death that patients experience in the time directly preceding and following a transplant have historically limited its use. Allogeneic stem cell transplantation (allo-HCT) can effectively treat diseases in the long run by exploiting the "graft vs. lymphoma effect." The outcomes of allo-HCT have significantly improved over the past fifteen years because of advancements in transplant technology. A meta-analysis of research on allogeneic hematopoietic stem cell transplantation (allo-HCT) revealed that among 1850 patients with Hodgkin's lymphoma (HL), 31% saw

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no relapses within three years, while 41-48% achieved overall survival (OS). From the year 2000 onwards, accrual was linked to a 15-25% survival probability without relapse and a decrease of 5-10% in both non-relapse mortality and relapse rates.[31]

CONCLUSION

In conclusion, Hodgkin lymphoma is a complex disease influenced by various factors and characterized by distinct neoplastic cells. Advances in treatment methods, including chemotherapy, radiation therapy, and immunotherapy, have significantly improved the chances of complete recovery for many patients. Allogeneic hematopoietic stem cell transplantation is a potential cure for relapsed or refractory cases, but there is a risk of graft-versus-host disease.

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SOCIAL WELLBEING OF SCHOOL TEACHERS IN THEIR PROFESSIONAL COMMITMENTS

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ABSTRACT
A school is an essential organisational unit within a country. School is also the cornerstone of any country's educational system. A happy working atmosphere and a positive connection are critical to ensuring the high quality of instructors' work. Workplace difficulties can cause poor performance, job discontent, loss of enjoyment, stress, and a variety of other mental health concerns. Teachers' well-being is heavily impacted by a pleasant, healthy, and cheerful environment. As a result, the purpose of this study is to look at the social well-being and professional commitment of school instructors. Well-being is a multidimensional notion with cognitive, emotional, physical, and mental components; it includes dispositional, personal, organisational, and environmental aspects. A combination of cognitive, emotional, and physical protective elements may aid in the development of resilience and more effective approaches to dealing with the impact of negative circumstances in the teaching environment.
KEYWORDS: *Healthy, Happy conditions, Cognitive, Affective, Well-being, School, Social well-being, professional commitment.*

INTRODUCTION

Social well-being is the act of caring for oneself, others, and our connections. When we think about wellbeing, we often consider our physical health. However, this is merely one of the eight aspects of well-being. Spending quality time with people makes us feel good, right? Spending a lot of time alone might leave us feeling lonely. As we can see, social welfare is just as vital as physical health. Social well-being improves our entire well-being. Social health makes us feel good about engaging with the outside world, especially other people. Good social wellbeing entails being able to interact with a diverse range of people, feeling a sense of belonging, having empathy, respect, and tolerance for others, being able to manage emotions in various situations, recognising and managing the effects of actions on others, and being aware of our own and others' rights and responsibilities (Beri & Beri, 2016).

Social Wellbeing of School Teachers

Well-being is a multifaceted concept. This encompasses good feelings like happiness, joy, contentment, enthusiasm, amazement, and peace. It also entails strong physical health and positive, meaningful social interactions and connections. The latter is what defines social well-being. It is a dimension of well-being that is both personal and adds to our total well-being. The amount to which we have positive interactions and feel connected to others is a measure of our social wellbeing. It is essential for prosocial conduct and empathy towards others. Social well-being is described as the sharing, development, and maintenance of meaningful relationships with others. This makes us feel honest and cherished while also providing a sense of connection and belonging. Societal well-being is defined as the ability to participate, feel respected as a member of, and be linked to a larger social context. Consider our local community, society, and the environment in which we live. Feeling like we can make a difference in the lives of others and the world around us boosts our personal happiness. It can also have a tangible impact on the quality of life in our communities, resulting in increased social well-being.

Participating in community improvement efforts nearly always entails collaboration with neighbours. For example, when a community organises to renovate a public park, individuals of all ages may find themselves staffing an information booth or shovelling dirt together on several weekends. Parents will meet other parents while cleaning up the playground. Sharing these bigger, new activities with people may foster powerful alliances and relationships that would not otherwise develop in our daily work or personal life (Shukla, 2009).

Benefits of Social Wellbeing among School Teachers

Social connections have both long-term and short-term effects on our physical health and emotional wellness. According to studies, romantic connections, for example, are a major source of well-being for young adults and adolescents, but friendship support is associated with better levels of resilience.

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Promotes general well-being: The more close friends we have with whom we can share personal concerns, the greater our well-being. Our well-being, however, falls as the number of acquaintances grows. Life pleasure has been linked to the frequency with which we engage with friends as well as our contentment with those friendships.

Yes, boosting our social well-being has been found to reduce our chance of getting illnesses such as dementia. This might be because engaging in meaningful interactions with people, both talking and listening, helps to keep our minds sharp and our emotional needs satisfied. Provides a sense of safety, security, and belonging. It's not difficult to see how having someone we can confide in makes us feel better. After all, discussing secrets and news with others allows us to make better judgements and understand what is essential (Habib, 2019).

Promoting Positive Relationships and Connectedness

Teacher-student interactions, as well as the provision of teacher support and understanding, have a significant influence on students' sense of belonging. Belonging is linked to higher involvement in learning and education (CESE, 2015). Strategies include greeting students by name, checking in with them, showing interest in their lives outside the classroom, negotiating classroom rules, and valuing student voice in decision-making. Provide options to meet kids' interests, abilities, and preferences. Setting good expectations for learning and conduct. Providing positive reinforcement to pupils vocally. Offering private counselling to pupils on problematic behaviour. Make our reason clear, for example, 'I am choosing to meet with us discreetly so that I do not disgrace us in front of our classmates (Malini, & Janakavalli, 2018).

Promoting pro-social behaviour

- Foster pro-social behaviour by engaging students in helping activities such as peer tutoring, classroom tasks, and teacher assistance
- Model respectful behaviour and language towards students and staff
- Use classroom activities and lessons to explore and discuss empathy, personal strengths, fairness, kindness, and social responsibility
- Use a variety of teaching methods such as discussion questions, extra reading and group projects to foster critical and reflective thinking, problem-solving skills, and the capacity to work effectively with others
- Teaching and reinforcing positive social skills such as self-awareness, social awareness, responsibility and decision-making.

Example of self-awareness – show we understand. For example, 'I can understand why we would feel angry. Let's think this through.' Example of social awareness – encourage perspective taking, 'Bob didn't realise that was important. I don't think he did it on purpose – do we?' (Mowat, J. G. (2019).

Professional Commitments

"Profession" and "Commitment" are the two terms that make up professional commitment. The term 'profession' refers to a career that requires particular training and a formal qualification, and the individual associated with the profession is referred to as a "professional." Commitment refers to the time, effort, and commitment that a someone spends to a cause or employment. A profession is a vocation or a vacation that involves the development of knowledge and abilities for the benefit of humanity (Gajjar, 2024). Commitment is a multidimensional idea that involves producing human energy by influencing the human psyche. Professional commitment may also relate to an individual's social-psychological link. Professional dedication is the primary focus in the educational system since it improves organisational performance. Similarly, schools are among the most significant institutions in an organisation(Migliorini, Tassara, & Rania, 2019). Their ability to perform effectively is dependent on their alignment with society's standards. The educational institution's schools, colleges, and universities bear responsibility for satisfying such expectations. However, schooling from the perspective of changing a student into a responsible citizen is impossible without instructors' dedication to their vocation and institution. Brooks and Swalis (2002) defined professional commitment as an individual's strong sense of identity and engagement in the profession. Raheim (2009) (8) said that teacher commitment is expressed in six dimensions of his position, including commitment to the learner, dedication to the institution, commitment to the task, commitment to attain excellence, commitment to society, and commitment to well-being. Beri and Beri (2016) discovered that teacher commitment to the school is a significant predictor of teacher work performance and well-being. The professional commitment of teacher educators refers to the dedication, vow, or pledge to behave and act by certain established and well-accepted principles and norms, which primarily affect student-teachers, society, profession, the pursuit of excellence, and basic human values. It is a prerequisite for effective performance in teacher training scenarios, along with other professional competences required by teacher educators (Sharma, 2010).

Redefining Social Wellbeing Activities into Professional Commitments

Well-being activities provide them with an escape from the monotony of everyday life. Engaging in unique and creative activities is more than just a break from routine; it acts as a mental catalyst, a spark that pushes our thoughts to get off autopilot and accept

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fresh views. This point can't be stressed. Some employees may be cautious, if not dubious, to participate in activities that are outside of their comfort zone, such as yoga or art therapy. However, it is precisely these new and different experiences that provide the greatest advantages to educators. A seasoned educational leader, now with Teach First, once shared a significant insight with me: when educators near the end of a difficult term, it's critical to engage in activities that disrupt the cycle of our typical routines. This step is essential in effectively 'winding down' (Kaur, Ranu, & Brar, 2011).

Every educator is familiar with the never-ending cycle of work that lasts until the last day of class, frequently resulting in a delayed capacity to switch off, tiredness, or stress-related ailments. Teachers return from breaks feeling exhausted, having taken too long to relax from the stresses of the semester (Rajkumar, 2017). The justification for our regular term breaks is straightforward: they are critical for relaxing both body and mind from weariness while maintaining the high standards required for successful teaching and learning. As a result, a revitalising staff yoga session or an interesting art class, especially if conducted by a willing member of our team, might be an excellent beginning point. Such activities not only encourage relaxation but also a communal 'winding down', preparing employees for a rejuvenating holiday (Holsblat, 2014).

School teachers' social well-being is critical to their capacity to carry out their professional responsibilities. It covers a variety of topics, including their mental health, work-life balance, social contacts, and general support from their working environment. Here are some key points to consider:
Mental Health and Stress Management: Workload: Teachers may have heavy workloads that include class planning, grading, and extracurricular activities. High workloads can cause stress and burnout. Emotional Support: Having access to mental health resources and therapy can help teachers cope with stress and emotional issues.

Work-Life Balance: Time Management: Teachers can use effective time management skills to balance their professional and personal life. Flexible Scheduling: Schools that offer flexible scheduling or decreased hours for certain assignments might help instructors manage their professional and personal lives.

Professional Support and Development: Continuous learning and professional growth can improve job happiness and competency. Mentoring Programmes: Experienced mentors may guide and help less experienced instructors, creating a collaborative environment.

Social interaction and collegiality: Supportive Colleagues: Positive interactions with colleagues can offer emotional support and alleviate feelings of loneliness. Teamwork: Collaborative teaching methods and project-based learning can enhance professional ties and improve teaching results.
Recognition and Reward: Acknowledging Efforts: Regularly recognising instructors' hard work and accomplishments may increase morale and motivation. Incentives: Offering incentives such as bonuses or more time off can boost work satisfaction.

Administrative Support: Clear Communication: Transparent communication from the school administration about policies and expectations helps alleviate confusion and stress. Access to proper teaching tools and materials is critical for effective instruction and lessens the stress on instructors (Bogler & Somech, 2004).

Positive relationships with students' parents can contribute to a supportive community atmosphere. Community Involvement: Encouraging teachers to participate in community events might help them feel more connected and socially healthy. The work environment is safe and healthy. A safe, clean, and healthy work environment is critical to teachers' well-being. Adequate Facilities: Having access to appropriate facilities, such as rest spaces and break rooms, may give instructors much-needed breaks throughout the day.

CONCLUSION

The profession of teaching is not, and should not be, seen as self-serving. In the classroom, teachers undoubtedly take the lead, but they should not approach the task from the standpoint of what would make their work the simplest. Teaching effectively is a demanding profession that frequently calls for hours of preparatory planning. It takes less planning to create an engaging learning activity than it does to just lecture students for class time; yet, knowledge comes from involvement. It is now simpler than ever to exchange material, make international phone calls, and inquire about the well-being of loved ones thanks to modern technology. We need people in our lives to lean on in difficult times and celebrate happy occasions. We all need to feel like we can talk to someone when things are tough. Talking and listening together can be extremely effective in assisting individuals in making progress. We must create healthy, mutually beneficial relationships and make room for others. When someone gives their perspective, describes their experience, or expresses how they are feeling, pay attention to them.

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THE EXPRESSIONS OF THE FROWNED FACE IN THE QUR'AN

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ABSTRACT
The Holy Qur'an also describes the meaning and expressions of a wrinkled face in different contexts. This allows for a deeper understanding of the spiritual and linguistic aspects of a wrinkled face. Facial expressions mentioned in the Holy Qur'an show how a person's mental state is reflected through non-verbal expressions.
KEY WORDS: *Quran, face, wrinkled, frowned, linguistics, non-verbal.*

Of course, we always look at people's faces when communicating with them. This process is repeated several times in our daily life. A mother's knowledge of the desires of her nursing child that she cannot explain in words, and the aids in understanding language in crowded streets and places with a lot of people's noise are all non-verbal tools. Summing up the above points, the face is the body part where mental states are manifested in the most complete form. The reason is that facial expressions are a powerful tool for expressing inner behaviors such as embarrassment, fear, anger, joy, and sadness.[1]

The first verse of Surah Abasa in the Holy Qur'an is also related to the non-verbal state of the face. That verse is "عَبَسَ وَتَوَلَّى" "he frowned and turned his face away"[2]. In the dictionary, العبوس means "wrinkling his face, frowning, squinting between his eyes", "joining the skin between the eyes and the forehead"[3] expresses its meaning. In addition to these meanings, "squealing of the face from heart palpitations"[4] and also means "heavy, intense". This meaning is found in the Holy Qur'an in the combination "يَوْمًا عَبُوسًا". The word عبس is also found in Surah Muddassir. « ثُمَّ عَبَسَ وَبَسَرَ » – " Then he frowned and frowned "[5].

In the Holy Qur'an, عبس appears in two verses. They are the first verse of Surah Abasa and the twenty-second verse of Surah Muddassir. Both verses consist of two words and conjunctions. From this we can understand that body language can express many meanings even with few expressions.

In the Surah, the epithet al-bws is used in relation to Muhammad a.s. The reason is that the Prophet (pbuh) was explaining the religion to the non-Muslim nobles and leaders of Makkah at that time. Because, usually, a change in the elders of the people causes a change in a large community, and this meeting was extremely important. At that time, a companion named Abdullah ibn Umm Maktum, who was blind in both eyes, came to the Prophet (pbuh) to study religion and the Qur'an, and in a state of ignorance, he called Muhammad (pbuh) several times.

In the body language, it is said that al-bws "twitch the forehead" and especially the middle of the two eyebrows, just like the number 11 or 111 in Arabic writing. This sign alone is enough to express feelings of anger or, if not, to reflect the expression of dissatisfaction, non-acceptance, disapproval of a place, person, or work.[6]

At the beginning of the sura, the verb did not appear in the 2nd person عَبَسْتَ وَ تَوَلَّيْتَ, but instead of the 3rd person عَبَسَ وَ تَوَلَّى a to inform. As Sheikh Zoda said, "It is as if the person who frowns and turns away here is not the person being addressed, but another person and the person being addressed is being complained about his work. This means that it is an unimaginably bad thing to happen to a person who has been sent to the worlds as a blessing and has a great character. Allegedly, it is assumed that this case happened elsewhere. In the following verses, the change of address to the 2nd person is due to the increase of denial and rebuke of the deed.[7]

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[1] مهدي أسعر عرار.البيان بلا لسان.دراسة في لغة الجسد.-الكويت.دار الكتب العلمية.2007.ص.45
[2] Muhammad Sodiq Muhammad Yusuf.Tafsiri Hilol.-Toshkent,2022.6-jild
[3] إسماعيل بن حماد الجوهري أبو نصر.الصحاح.-القاهرة.دار الحديث.2009.صفحة 432
[4] ألو القاسم حسين بن محمد بن المفضل المعروف الراغب الأصفهاني.المفردات في غريب القرآن.- بيروت.دار المعرفة.2008.صفحة 544
[5] Muhammad Sodiq Muhammad Yusuf.Tafsiri Hilol.-Toshkent,2022.6-jild
[6] خالد بن محمد المسيهيج،لغة الجسد في القرآن الكريم،ط1،دار لوتس،2020. صفحة 105
[7] كمال عبد العزيز إبراهيم.لغة الجسد في القرآن الكريم.-ط1-القاهرة.الدار الثقافية للنشر.2010.ص64

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It is for wisdom and tender maturity that the speech is directed towards Muhammad a.s. When Allah Almighty informed about this situation about the missing person and said `عَبَسَ وَ تَوَلَّى in the sense of honor and respect to the prophet, it is understood as directing this case to another person.

While reprimanding His Beloved and last Prophet, Allah did not address him directly, but rebuked him as if he were talking about a third person, which is a unique example of the treatment of a friend to a friend.[8]

If we look at the lexical analysis of the verse, both verbs in the verse عَبَسَ وَ تَوَلَّى are past tense verbs and invariable verbs ending with fatha action. The subject of both verbs is hidden, the subject is the pronoun "u". The occurrence of verbs in three places along with two verbs and then the place in the verse, that is, it does not come with the letter "ta", which is not hidden in the verb of address, but comes in relation to the unseen, respect for the Prophet and is a grace. وَأَنْ جَاءَهُ الْأَعْمَى comes in the place of the nasb and is maffulun liajlihi. His original name was lāḍān jāʾh al-aʿmy. The letter was omitted and connected to the verb. The word that caused it to fall into the nasb state is either the verb ʿabasa or tawalāy. And جَاءَهُis a past tense verb, and the compound pronoun is mafūlun bihi and al-aʿmayy is a doer of action..
The part of the Surah أَنْ جَاءَهُ is a requirement for the occurrence of عَبَسَ وَ تَوَلَّى. Some scholars of Kufa say that the word " أَنْ " in the verse means " إِذْ " which represents time, and nothing else.[9]

أَنْ جَاءَهُ is in nasb because of the عَبَسَ و تَوَلَّى that came before it. For this reason, the meaning of turned away comes from. And reciting أَنْ جَاءَهُ with two hamzas in its place, ending it with the alif of تَوَلَّى between two verses and beginning with "when the blind came to him" is a negation of the Prophet, peace be upon him.[10]

The letter أَنْ in the verse comes before the verb. If the present-future tense comes before the verb, it often changes the meaning of the actual tense of the verb to the future tense. That is, the meaning of your saying أُرِيدُ أَنْ تَأْتِيَنِي means that you want it to come after you speak. It can also come before the verb in the past tense " هَلْ تَنْقِمُونَ مِنَّا إِلَّا أَنْ ءَامَنَّا بِاللهِ " i.e. "You" O people of books! Do you accuse us because we only believe in Allah and what has been revealed to us, and because most of you are evil-doers?" say "and it also comes before the command verb "» وَ إِذَا أُنْزِلَتْ سُورَةٌ أَنْ ءَامِنُوا بِاللهِ وَ جَاهِدُوا مَعَ رَسُولِهِ اسْتَئْذَنَكَ أُوْلُوا الطَوْلِ مِنْهُمْ "Believe in God and fight against His Messenger", when the sura was revealed... " In some verses, it can also represent a reason. « عَبَسَ وَ تَوَلَى * أَنْ جَاءَهُ الأَ « that is, " He twisted his face * When he came blind to him ".

The word عَبَسَ appears elsewhere in the Holy Qur'an. In the 22nd verse of Surah Muddassir, "ثُمَّ عَبَسَ وَبَسَرَ" appears as "Then he frowned and frowned".

For a broader discussion of who the reality in the sura is describing and how precisely it is described, we will also quote other verses around the verse of the sura related to this topic.

إِنَّهُۥ فَكَّرَ وَقَدَّرَ ١٨ فَقُتِلَ كَيْفَ قَدَّرَ ١٩ ثُمَّ قُتِلَ كَيْفَ قَدَّرَ ٢٠ ثُمَّ نَظَرَ ٢١ ثُمَّ عَبَسَ وَبَسَرَ ٢٢ ثُمَّ أَدْبَرَ وَٱسْتَكْبَرَ ٢٣ فَقَالَ إِنْ هَٰذَآ إِلَّا سِحْرٌ يُؤْثَرُ ٢٤ إِنْ هَٰذَآ إِلَّا قَوْلُ ٱلْبَشَرِ ٢٥
“ for he contemplated and determined ˹a degrading label for the Quran˺. May he be condemned! How evil was what he determined! May he be condemned even more! How evil was what he determined! Then he re-contemplated ˹in frustration˺, then frowned and scowled, then turned his back ˹on the truth˺ and acted arrogantly, saying, “This ˹Quran˺ is nothing but magic from the ancients“[11]
In the above verses, Walid ibn Mugheera, who is one of the greatest Meccan polytheists and one of the most advanced in poetry, as well as one of the best poets of the nation, expressed his opinion on the verses of the Holy Qur'an with his facial expression. At first, Walid ibn Mugheera heard Prophet Muhammad (pbuh) reciting the 90th verse of Surah "Nahl" and said, "I swear by Allah, what I heard has a special charm and charm.

The lowest part of it is a fertile ground for bearing fruit, and the upper part is the harvest", he praised with high praises and defended the Holy Qur'an from the inappropriate attributes attributed to other polytheists of Mecca. Hearing these words of Walid, the polytheists were worried that he would become a Muslim and said, "If Walid apostatizes, all Quraysh will apostatize." Abu Jahl, one of those who know his nature and character best, went to him and asked, "Are you going back from the religion of your forefathers?" said, this incident related to the situation that prevented him from this job was described in detail by the Qur'an Karim Walid's non-verbal expressions during his later denial of the verses of the Qur'an..

[8] *Shayx Alouddin Mansur, “ Qur’oni azim muxtasar tafsiri ”, 4-qism, “Movarounnahr” nashriyoti, Toshkent, 2020, 314-bet*
[9] *إعراب القرآن - ص 519*
[10] *فخر الدين الرازي، التفسير الكبير، دار إحياء التراث العربي،بيروت-لبنان، ط2، 1997*
[11] *Abdulaziz Mansur. Qur’oni Karim ma’nolarining tarjimasi. – Toshkent. : Toshkent islom universiteti, 2001. 333-bet. Muddasssir 18-25*

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If we analyze the verses structurally, إنَّ in the verse إِنَّهُ فَكَّرَ وَ قَدَّرَ is considered to be a prepositional letter and it is a letter that does not change with fatha. And the pronoun attached to it is a noun in the invariable form of the accusative verb, and it is the name of إنَّ . fakãra is an invariable past tense verb with fatha action, and its doer is the hidden pronoun "U". the verb فَكَّرَand its hidden subject together form a verb phrase. This verb phrase is in the place of the main clause and is the participle of إنَّ . and the verb qadãra is connected to the verb فَكَّرَ before it. And the letter fa in the word فَقُتِلَ كَيْفَ قَدَّرَ verse is a conjunction. the verb فَقُتِلَ is a past tense verb in the passive tense and its substitute verb is hidden and is the pronoun "he". and the word kayf is an invariable interrogative predicate with the action of fatha. From the interrogative meaning in Buyer, the meaning is surprise and mockery of his measure. ثُمَّ قُتِلَ كَيْفَ قَدَّرَ This sentence is more mature than the one before it. It came for the emphasis of a sentence similar to the one that came before it, and it is for the repetition of the emphasis. The letter ثُمَّ in verse ثُمَّ نَظَرَ is a connector that expresses the order of consecutive works with a break between them, as we said above. That is, Walid looked at people's faces in a state of anger when they said that he had "returned from his religion and is leaning towards Muhammad". ثُمَّ in the verse ثُمَّ عَبَسَ وَ بَسَرَ is also a conjunction as mentioned above. That is, then he scrunched up and twisted his face, and then narrowed his eyes and looked arrogantly out of the corner of his eyes.

Allah described his face and said, "Then he wrinkled his face and frowned." Two issues can be found in this verse. The first issue is that from this word of God, Walid knew in his heart that Muhammad (pbuh) was true, and only because of his stubbornness, he did not believe. There are several reasons for this. First, a frown appeared on his face as he decided to tell himself that this was a lie. If he was sure that his allegation was true, he would have been happy instead of angry. As long as he was not happy, we can know that his suspicion is weak. And the second one, which we have mentioned above, is that Walid said that after listening to the verses of the Qur'an, he came to his people and heard a wonderful word that was neither the words of a man nor a jinn. knew that Thirdly, he knew that magic is one of the things that are based on blasphemy against God, and Muhammad (pbuh) was only calling to God. These conclusions made Walid admit that what he was talking about was a lie and a lie, and for this reason "he frowned and frowned".[12]

In many places of the Holy Qur'an, the conjunction ثُمَّ is repeated and it gives an additional meaning. The presence of more than one conjunction in the same verse can further affect the meaning. For example, a verse containing the conjunctions ثُمَّ and ف has several meanings. At this point, psychological attention can be one of the main important things of these goals. There are many examples of this situation that we consider, and some expressions may be more understandable than others. However, in the above verse, we will look at the reason for the appearance of this conjunction and how the conjunction in this verse gives its own spiritual meaning. In the above verse, when the people sent Walid ibn Mugheyrah as an ambassador to Muhammad, after the Prophet s.a.w recited a few verses from the Qur'an to him, what Walid heard was something he had not heard before and that it had its own charm and that it was not the words of a human being. admits. However, due to the threats and reproaches of his companion, a thought contrary to his thoughts comes out of his tongue, and Allah the Exalted clearly describes these moments. In fact, despite the fact that Walid ibn Mughira's psychological state lasts only a few seconds, the long description of this scene makes one think. The Holy Qur'an describes its situation in nine verses. The situation is depicted precisely and slowly, as shown in slow motion. One of the things that contributed to its slowness here was the conjunction thumã, which appears four times. It describes the sequence of actions, their gradual rise. These actions describe to us the emotional struggle of Walid ibn Mugheera after hearing the Holy Qur'an and being influenced by it. Apparently, it describes the hesitation between the arrogance of his stubborn ego and the recognition of the truth.

The peculiarity of the conjunction ف, which appears in every verse at the end of the describing verses, is that it expresses the sequence of the connecting words and the absence of a break between them. For example, in your sentence خرج محمد فزيد, it is an equal conjunction in the sense that both of them performed the action of leaving. However, from the letter f alone, we understand that Muhammad came first and Zayd came after him. It turns out that there is no other work or person between their exits. If you say this sentence خرج محمد وَ زيد the meaning of this sentence is that the act of exiting in the sentence is the same for both of them, but who went out first and did another person come out among them or did another action take place? Chances are that it may have happened. Now, when you say this sentence as خرج محمد ثُم زيد, we understand that both have come out and there is order in their sequence. That is, Muhammad came out first and Zayd came out after him. However, it differs from the conjunction ف in that there is a break between the actions of the two, a little rest. From this, we conclude that in the verses describing Walid ibn Mughira, the sequence of actions in the places where the conjunction thumã occurs is the same as described, but there is some rest. We can understand that the verbs of Walid's thinking, contorting his face, and looking did not happen quickly, but slowly. This can be compared to the situation when a person thinks deeply about an important issue, stares for a long time, and the thoughts that pass through his imagination appear on his face. We can understand that the linker f thought about the idea that appeared in him because of the Holy Qur'an. I will remind you of the reality and it will be more understandable. Walid and his companion came as ambassadors. They listened to the Holy Qur'an there. On their way back, Walid spoke warmly about the Qur'an and admitted that it was a unique book and that he had never heard anything like it. However, in order to dissuade him from these thoughts, his

[12] *Tafsirur rooziy sahifa 201, 30 juz kitob*

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companion warns him that his kingdom will go away, that his people will be displeased with him, that he is going back from the religion of his ancestors, and that his actions will have many consequences. And when Walid admits the truth of something, he thinks about the losses that he might lose if he admits it. He hesitates between truth and falsehood. Finally, when he does not agree, he says the above words as if to convince himself and his people. That is, after a long reflection, he says that this is the magic that has affected him quickly without thinking as if he rejected his positive thoughts about the Qur'an. It is more clear to God himself.

وَ وُجُوهٌ يَوْمَئِذٍ بَاسِرَةٌ

" And ˙other˙ faces will be gloomy, "[13]

Different meanings of the verb بصر can be found in dictionary books. In particular, it is said to demand something before its time. For example, the compound بصر الدين is used in the meaning of "paying the debt before the due date". Also, this word is used for "to rush, to express disappointment on the face, to pollinate the fruits before the deadline, and the condition of the fruits at the time of ripening." Also, it also expresses the meaning of strong browning, darkening of the eyelids and frowning, change of color. At the same time, the Arabs call unripe persimmons busru. In the above verse, it is said that the faces of the inhabitants of hell are twisted from the torments of the hell before they enter it. The occurrence of this word in this place is appropriate because the facial expressions of the unbelievers, whose faces are twisted because they know the consequences there before they fall to their places in hell, are expressed by the verb بصر. So, the verb basara means changing the state of the face when hearing bad news before solving the problem related to the bad news or before facing it.

In the dictionary, a frown is a frown and a look with strong hatred. In the interpretations, frowning and frowning faces are mentioned. In body language, there are mutual differences in meaning between a frowning face and a frowning face. "Frowning" means frowning, frowning, and it is understood in the opposite sense of the meaning of happiness and brightening of the face. We understand a wrinkled face as a face in a state where the color has faded, the shape of the upper lip has been changed and it is raised towards the nose. A face of this appearance is disgusting and unsightly to the extent that it makes the caregiver's taste dull. [14]

If we explain the above contorted face in more detail, we can imagine a face that contains several inseparable emotions of anger, frustration, fear, hatred, and discomfort. . One thing is known that the person looking at that face will definitely not like that scene. Let's use our imagination to visualize a person walking against the hot wind of the desert in hot weather. It is similar to the scene of a person walking against a hot wind, when the particles of hot sand hit his face and he cannot open his eyes in such a difficult situation. At the same time, he is not angry, but he feels needy, in a bad situation and hates life. Of course, it is difficult for a person to fully describe this scene until he is in this situation.[15]

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SOCIO-CULTURAL TECHNOLOGIES OF SPIRITUAL DEVELOPMENT AND SCIENTIFIC MANAGEMENT OF SOCIETY

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ABSTRACT
The need to use several socio-cultural technologies, which can be the basis for determining its strategic goals, has been researched, as well as in all areas of social development. In particular, it has been revealed that spiritual renewal is important in reforms related to strategic programming (design) along with social, economic and political factors in the quality level or stages of development of society. This is relevant as it shows that spiritual development is an important process in the scientific management of society.
KEY WORDS: *Society, spirituality, strategy, development, spiritual renewal, scientific management of society, reforms, socio-cultural technologies.*

INTRODUCTION

Spiritual renewal as a necessary level of the development of society, along with social, economic and political factors, the reforms implemented in the spiritual and educational aspects are considered important.

The President of the Republic of Uzbekistan Shavkat Mirziyoev emphasizes the following points about spirituality in the development of society and its influence on development: “In my opinion, the world of humanity has a great lamp - the lamp of spirituality. The difference between this lamp and others is that it illuminates a person's mind and thinking, awakens his heart and conscience, and strengthens the feeling of humanity.

As we are starting to create a new renaissance of Uzbekistan, it is necessary that such a spirit of spirituality explodes in the hearts and minds of each of our compatriots, and it encourages us to do good deeds and to live with a high sense of responsibility” [1.260.]. Also, although socio-cultural technologies are considered an under-researched field in the scientific management of society, its philosophical knowledge and mastery can be understood at the moment only with the limit of information. Even if the benefits from their application do not guarantee useful skills for the society, we can observe the experiences of using socio-cultural technologies in the development of the society. The development of society requires spiritual-educational and innovative approaches in the process that requires its scientific management.

LITERATURE ANALYSIS

Spirituality is a concept embodying the inner life, spiritual experiences, mental abilities, and perception of a society, nation, or individual. Spirituality is the basis of human and social culture, the main factor of a certain direction of human and social life. It has a strong influence on the formation, change or crisis of a certain economic and social life system. If the spirituality is enriched, the society will prosper, and on the contrary, if the spirituality is impoverished, the society will gradually decline. Spirituality is the main factor and foundation of development of society and nation. In this sense, the concept of "spirituality" is "a socio-spiritual phenomenon that fully embodies ideological, ideological, educational, cultural, religious and moral views in the life of society" [2.18.].

Or in the new stage of society’s development, "For us, spirituality is mutual trust, respect and attention between people, noble aspirations to jointly build the future of the nation and the state, a set of exemplary qualities" [1.261.]. In other words, spirituality is the foundation that determines the content and quality of all political and social relations in society. The stronger this foundation is, the stronger the nation and the state will be.

There are many examples from the history of mankind that lack of spirituality and lack of ideas leads any society to decline, weakens state policy and management, causes corruption, crime and immorality to take root. In this regard, special attention is paid to spiritual and educational reforms in the development strategy of New Uzbekistan.

Interrelationship of socio-cultural technologies of spiritual development and scientific management of society, its innovative ways, strategic goals in society have been one of the centers of interest of researchers-scientists. In particular, as the most acceptable

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option, we can take scientific views related to the name of Henri Fayol. The scientist's ideas and developments on the subject began to be applied on a large scale in the management of society. In particular, A. Fayol "Considers the organization as a whole structure, not individual work elements, and improves the efficiency of work by improving special concepts such as the principles of rational management of the organization, management functions, management system"[3.86.].

Human relations also began to develop in society, and the basis and primary sources of such an approach go back to the "Hawthorne Experiments" of the American philosopher and scientist Elton Mayo. In the experiments carried out at Western Electric company, increasing labor productivity was achieved as a result of being attentive to shop workers, taking care of their interests. "Such attitude was accepted by the workers as a motivating factor, and it was observed that labor productivity increased based on the formation of positive attitudes" [4.96.]. As a socio-cultural phenomenon, it shows how subtle and multifaceted the management technology is. Such events, unlike general technological processes, are characterized by their unexpected and unique aspects, require constant improvement and perfection of the management culture.

Due to globalization, a quantitative approach to such socio-cultural technologies has begun to develop. The main essence of this approach is the effective use of mathematical methods in the culture of corporate management of groups and organizations, in particular, the methods of analyzing labor operations and creating mathematical models. Although a special socio-cultural technology absolutely suitable for the collective management system has not been developed, but as a result of the use of mathematical apparatus, the possibility of in-depth knowledge of the management technologies of the society and the prediction of certain economic results has begun to increase.

The doctrine of approach to management culture as a special process considers the life of society as a complex and dynamic aspect and determines the necessity of management as a continuous system of performing interrelated functions. Such functions include: planning, organizing, assigning tasks (administrative management), motivation, leadership, coordination, control, research, communication, evaluation, decision-making, personnel selection, negotiation and delegation. If you pay close attention to this, it will be revealed that it is a process based on the formation of interpersonal relationships. This means that it is necessary to raise spiritual and educational literacy in interpersonal relations to a new level, to form educational work on the basis of an effective mechanism of activity.

Through a systematic and situational approach, there is an opportunity to understand that the processes taking place in the organization, the existence of a causal relationship between all the participants involved in the production, the external environment and the situation, the socio-cultural relations are the decisive factor in the behavior of the participants-subjects.

Another approach that reflects the attitude to people in the production process is the theory of "human capital", according to which human power in the enterprise or society is perceived as capital, that is, property, in particular, in the form of material values. Within this theory, situations and assertions about corporate governance and culture are reflected in economic terms and socio-cultural categories that are understandable to entrepreneurs. According to this theory, human capital is usually measured in terms of funds. In this regard, the architect of Singapore's innovation policy, Philip Yeo, made an interesting point: "... Innovation is not a luxury, but a necessity. We do not have any natural resources, therefore our wealth is the human mind "[5.], it is not for nothing that he said. One of the modern approaches is the concept of human resources development, in which the conditions created for effective work of an individual for the benefit of the organization or society are considered as a central issue. The concept of identifying and satisfying the needs of the subjects of this relationship, and creating conditions for their professional and personal (spiritual) perfection lies as a factor in the development of corporate culture. The socio-cultural position of a person in society has a comprehensive effect on the set of needs identified in it. As a result, the formation of views and approaches to the scientific management of society and their implementation in life ensures efficiency.

As stipulated in the Decree of the President of the Republic of Uzbekistan "On the State Program on the Implementation of the Strategy of Actions on the Five Priority Areas of the Development of the Republic of Uzbekistan in the Year of Development of Science, Enlightenment and Digital Economy in 2017-2021", It was entrusted to ensure the creation of the state program, the national program for the development and support of reading culture, the development of the field of science, the social protection of the population, the concepts of the development of the drinking water supply and sewage system, and the development of the strategy for the development of the construction industry"[6.] . In turn, it will be possible to see the innovative approach to socio-cultural technologies of scientific management of society. In our opinion, this will contribute to spiritual development, taking into account the possibility of changing the socio-cultural lifestyle of the society, especially the population, through the development of science. The content of the main concepts of management in developed societies, in particular, in the scientific management of society, represents the personal and corporate management approaches typical of its time. Even now, modern approaches of socio-cultural views are being used in various development models. Modern socio-cultural views also try to understand a person from this point of view as much as possible and to achieve the perfection of a person by awakening his thinking and inner reserves.

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DISCUSSION AND RESULTS

The land where our ancestors lived, their socio-cultural life, people's way of life and worldview are important because they are built on the principles of collectivism and humanity. No matter how much knowledge and experience humanity accumulates about nature, society and the universe, on the one hand, its adaptation to the environment and the way of life have become easier, and on the other hand, deepened socio-cultural life has made it vulnerable to new puzzles and questions. Accordingly, although the rational knowledge of man has improved the freedom and the quality of life, it has caused complications in another way. The Uzbek people have been following the principles of collectivism and humanitarianism in the socio-cultural sphere. But at a time when the society is developing so rapidly, we see that new approaches to socio-cultural technologies of scientific management of society in Uzbekistan are directly related to the reforms implemented at the new stage of our development. The President of the Republic of Uzbekistan emphasizes, “Now each of us, first of all, the task of the heads of state administration bodies is to ensure the responsible performance of the tasks assigned to us based on a critical assessment of the state of affairs in the field and sector for which we are responsible” [7.235.]. As an innovative approach to social and cultural technologies in the management of society, we can see the need to develop enlightenment and education based on the principle of “from the strategy of actions to the strategy of development”. Innovative approaches to the development and implementation of socio-cultural technologies in the scientific management of society are also important in eliminating problems and difficulties for human activity by the subjects of these relations, in particular, nature. Therefore, innovative approaches to the socio-cultural development of the society encourage the members of the society to never get stuck in one place and to be active, responsible and intelligent in order to eliminate the shortcomings. This paradigm is a recognition of significant scientific achievements by philosophers, who pose a number of problems to the scientific community and develop methods, tools and technologies to solve them in a new way. The paradigmatic approach to the socio-cultural development of the society is of interest to the representatives and researchers of this field as an innovative approach at the new stage of the development of our country. As a result, concepts that are taken as truth for society today are being questioned tomorrow. Because any social reality is relative, that is, it is incomplete and uncertain, and has the possibility of change and development. Therefore, the innovative approach to the development of socio-cultural technologies in the scientific management of society requires that the society is scientifically managed with the help of methodological methods and tools with a direct impact on the development of all areas of society. The essence of the scientific management of the society is to determine the main goal and direction of the socio-cultural development of the society. Reconciling or reconciling interests in social life is much more complicated to solve in a simple way. Therefore, the society requires the development of new scientific-theoretical bases for the adjustment and reconciliation of these interests. In the development of socio-cultural technologies of scientific management of society, we can observe innovative approaches, in particular, respect for the interests of others in society, adaptation of one's interests to the will of others, general agreement, i.e. social consensus, and striving for positive results. This means that the need for innovative approaches of the socio-cultural nature of society management has a regular and continuous nature.

“Precognition and broad observation of social events in society is based not on people's wishes, but on thorough knowledge of socio-cultural laws of society's development. Practice shows that it is possible to conduct a correct, scientifically based policy only if one can clearly understand the decisive directions of reality” [8.309.]. From this point of view, we can present spiritual and educational programs promoted in the “Strategy of Actions” and “Strategy of Development” of innovative activities in the application of new socio-cultural technologies in the scientific management of society in Uzbekistan.

As the President of the Republic of Uzbekistan Shavkat Mirziyoyev noted, “Today we are moving to the path of innovative development aimed at radically renewing all spheres of state and community life. It’s not for nothing, of course. Because in today’s fast-paced world, who wins? The state that relies on a new idea, a new idea, and innovation will win.

Innovation is the future. If we start building our great future from today, we should start it on the basis of innovative ideas, innovative approach" [9.20.]. The main focus in the implementation of the development strategy is the principle "Human interests are the most important" and the idea “The people should serve the people, not the state agencies, but the state bodies” are becoming a life-giving force. By establishing a dialogue with the people, a new system of socio-cultural technologies has appeared in the society that practically protects the rights, freedoms and legal interests of citizens.

We have set ourselves the ambitious goal of building a new Uzbekistan together with our people. In this regard, the new idea that "Society is the initiator of reforms" is getting deeper and deeper into our daily activities.

"In increasing the practical effectiveness of the reforms, we need to make our population more active and proactive in promoting new local initiatives.

Most importantly, as a result of these reforms, we should create comfortable and decent living conditions for our people. In order for our people to earn enough income, we need to create the most favorable business and investment environment and increase new

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enterprises and jobs. If we do not do these extremely urgent things ourselves, no one will come and do them for us" [10.5.]. Socio-cultural technologies of management will be improved along with the socio-cultural renewal of the society.

The virtual lobby of the President of the Republic of Uzbekistan and People's lobby, as well as special units for working with citizens appeals established in each state body, formed a qualitatively new effective system of working with the population.

In the Republic of Uzbekistan, the concept of administrative reforms has been developed to fundamentally reform the state management system, develop the "Electronic Government" and public service delivery system, reduce the administrative influence on the economy and expand the market mechanisms of management, create a healthy competitive environment and a favorable investment climate.

Comprehensive measures for the development of the social sphere, strengthening social protection and health care of citizens, providing the population with cheap and high-quality medicines, increasing the employment and real income of citizens, expanding the construction of affordable social housing, and comprehensive support for persons with disabilities were focused on.

"In cities and villages, model and high-rise buildings with a total residential area of more than 3.5 million square meters have been built. The volume of residential construction increased by 3.5 times compared to 2010.

According to the results of the dialogue with the people, it was decided to restore the 11-year general secondary education, transparent mechanisms of admission to higher education institutions were introduced, and quotas were seriously increased. The post-graduate education system was fundamentally reformed to international standards and a new system was introduced" [11.]. As a result of measures taken to ensure international peace and harmony in the cultural sphere, well-thought-out and mutually beneficial foreign policy, mutually beneficial relations with neighboring countries were established. Favorable conditions are being created for the development of trade-economic, cultural-humanitarian relations in the territory of Central Asia.

Social objects are stable objects that form systems. For example, we see many objects invested in social and cultural technologies in the development of a sustainable system. This requires modern approaches in the design and modeling of social technologies.

The uniqueness of these approaches comes from the possibility of assigning different properties to objects - relations, processes of reliance of resources on other objects - in a word, parameters are manifested in the form of quantities. A trait can be static (gender) or changeable (skill level, mood). The socio-cultural study of the importance of the above situations in the management process will have an important practical result. Because changes in properties allow objects to predict their general performance when certain situations arise. The ability to predict can affect the guiding object (consultant) by changing some properties of the object.

Creating a plan or strategy to systematize this information is of great importance. With the help of plans and strategies, it will be possible to analyze the operations of objects based on facts, to identify "weak" areas of the management technologies being created. It also makes it easier to connect objects to projects created by a group of objects. Such innovative approaches to socio-cultural technologies in the scientific management of society are necessary for the design of social technologies.

In this regard, "I want to emphasize: today, spirituality must be ten steps ahead of other fields, spirituality must become a new force, a new movement!

For this purpose, our people, especially among the youth, are spiritual and enlightened we need to raise things to a completely new level in terms of quality and content.

Based on the proposal made by our intellectuals at the recent meeting in Surkhandarya region, we will establish a spiritual sector in addition to the 4 sectors operating in the regions"[12.]. It is clear from this that the amount of change in any internal or external environment for the development of society requires a response action. Using this method, it is possible to register various situations in society and use them to create social technologies.

The innovative approach of socio-cultural technologies in the scientific management of society can have a positive or negative impact on socio-cultural life (process or project). The positive effect is that it can create additional comfort for interpersonal relations in the vital activities of society.

It should be noted that innovative design means the introduction of intellectual technological structure or qualitative changes to the existing society, that is, the modern redevelopment of these reorganizations. Dividing or separating the activity of social space into

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the activity of design will have a conditional character. Its advantage is that it allows to understand the specific features of future technological development.

CONCLUSION

Development of the socio-cultural sphere in the scientific management of society - firstly, the implementation of comprehensive measures to further strengthen social protection and health care of citizens, secondly, the creation of a developed network of social pharmacies, thirdly, increasing the population's employment and real incomes of citizens, fourthly, "consumption "basket", fifthly, expansion of the construction of social housing, sixthly, it is manifested in the formation of socio-cultural technologies that serve the strategic development of a number of society, such as comprehensively targeted support of the population in need of social protection and persons with disabilities.

Development of innovative management technologies as socio-cultural technologies of spiritual development and scientific management of society, as well as their introduction, should be considered one of the priority tasks of ongoing reforms. Innovative approaches to the application of social and cultural technologies of scientific management in the development of society are the main factor in realizing the strategic goals of the state and society. And this is not to educate a physically strong person, but to improve the members of the society both physically and spiritually. Today, in the delicate and fragile conditions where ideological struggles are sometimes open and sometimes hidden, this issue is extremely important in the current dangerous times.

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THE ROLE OF FAMILY AND NEIGHBORHOOD IN INCREASING YOUTH SOCIAL ACTIVITY IN OUR SOCIETY

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ANNOTATION
This article describes the importance of family and neighborhood in increasing the social activity of young people in the life of society and the role of young people in building civil society that is taking place in society, the thoughts on the upbringing of children of orphans and warlords, the opportunities given to young people today.
KEY WORDS: *Neighborhood, Family, Abdulla Avloni, Amir Temur, globalization, value, youth activism, patriotism*

The democratization of society and the processes of modernization of the country have a great impact on the socialization and education of young people, who make up the largest social stratum of the population. Young people are the foundation of society, the advanced stratum of the population, the reliable owners of the future. From this point of view, it is possible to clearly imagine the future of that society depending on the level of knowledge, worldview, thoughts, and spiritual image of the young people of each period [1]. Of course, young people cover a large part of our social stratum, and raising them to be educated and have a broad worldview is the task before all of us.

To develop civil society in Uzbekistan, it is necessary to form an active civil position in young people in order to reduce the risk of negative events of the era of globalization and educate them as spiritually mature individuals. After all, only young people who have a civic position understand what the main goals of society are and deeply understand their responsibility to the people and society [2]. At present, in many countries, young people have gone astray with destructive ideas. Therefore, neighborhood activists and family heads are required to educate children and encourage them to read books in their free time and have a friendly relationship with them.

Another important issue that always comes to our mind is related to the manners, behavior and, in a word, worldview of our youth. Today, times are changing rapidly. Young people are the ones who feel these changes the most. Let the youth be in harmony with the demands of their time. But at the same time, let him not forget his identity... At what expense will we achieve this? It is not without reason that they claim that education, education and only education" [3].

As noted by our thinker Abdulla Avloni in his work "Turkish Gulistan or Morality", "Human wealth is worthy, if he gets a good education, avoids bad habits, and grows up accustomed to good habits, then everyone will be an acceptable and happy person". He wrote down the wise thought "let it go"[4]. Because Uzbekistan is literally a country of youth. Therefore, the young generation, who will be the support and support of our tomorrow, are new, independent thinkers, people who have thoroughly mastered modern knowledge and skills, who are the real owners of this country, who are capable of taking responsibility for the fate and future of the Motherland. putting adulthood at the center of its ongoing reforms. Because there are a number of reasons why training such young people as a decisive force is a priority. Over time, it is becoming more and more clear that this fact was a far-sighted historical step [5]. Since Uzbekistan has long been a country with many children, we have been paying special attention to youth education.

Amir Temur's children also got involved in the affairs of the government. Many thousands of troops were given to them and they were appointed as heads of different provinces. They worked in consultation with their father. If necessary, together with their father, they brought their troops and entered the battle and put the honor of their father's kingdom and state in place. When the children stepped on the wrong path, the father punished and reprimanded [6].

First of all, we define the concept of social activity, it is an important factor in the socialization of a person. Such a person feels that he is responsible not only for himself, but also for the people around him. Due to this, a socialized person, having a good understanding of the interests of the society in which he lives, is not indifferent to the forces that threaten his interests. Indifference is alien to a socialized person[7]. Because socially active young people need all the knowledge and skills to become people with

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their own worldview and opinion in the future without thinking about themselves in the society and not being indifferent to the fate of their family, neighborhood and homeland. is brought up to have.

President Sh.Mirziyoyev emphasizes that - We will continue the state policy regarding youth with determination. Not only will we continue, but we will raise this policy to the high level required by today's times as our top priority. We will mobilize all the strength and capabilities of our state and society so that our young people can be independent thinkers, have high intellectual and spiritual potential, and become people who are not inferior to their peers in any field in the world and be happy. The words of [8] determine how relevant our plan is.

The external environment has a great influence on the formation of the worldview of young people and the enrichment of their minds. First of all, this can be defined as the social environment, a person's family, friends, role models, and a number of similar social institutions. In particular, persuasion that affects a person and leads him to his beliefs, motives, and actions related to a certain goal and interests [9]. In the current era of globalization, young people cannot be wrapped in their shells. Because we live in an information society, the role of family and educational institutions is incomparable in increasing the knowledge and experience of young people with modern media and directing them to use it only for the right purposes.

The neighborhood is a place of education. When a child is born in a family, he gets to know his parents for the first time, as he grows up, he starts to get to know the people in the neighborhood, and learns behavior, manners, overall positive qualities, first of all, from the neighborhood, more precisely, from his parents. he learns from his cousins, blessed fathers, and blessed mothers. When analyzed from this point of view, it is a way to improve the work in the “Family-neighborhood” system, to carefully preserve the rich and meaningful national traditions related to the family and the neighborhood, to harmonize them with universal human values, and to deeply instill the sanctity of family and marriage into the minds of the young generation. ensuring the strength and stability of the family, achieving legal literacy of family members are important factors of the stability and peace of the whole society. Mahalla, which is a unique form of social management, promotes family customs, traditions, happy moments in family life, and important events related to family life, along with carrying out several cultural and spiritual activities. is also appearing as a reliable center. The neighborhood is a place where every family and every individual has the moral potential and legal capacity to work with each individual.[10] Also, the methods of social control of youth behavior in neighborhoods and families are also unique, and while social control differs from state control, public control, religious control, and similar control institutions to a certain extent, it depends on the implementation of their functions. It also acts as a protective environment [11].

As the spiritual potential of the society grows, the forms and methods of political management also improve. In the changed historical conditions, there is a need for a new approach to the essence, content and tasks of the state. In the years of independence, with the restoration of the traditions of national statehood, the state's organizational and general reform activities gained a new meaning and importance[12].

Young people imitate their elders, learn from them, inherit certain knowledge and behavior from the people around them, and based on this, they evaluate the world and the environment[13]. That is why it is the duty of each of us to be a role model for the younger generation in the family and neighborhood.

The formation of a modern democratic state and an effective system of political power that ensures the rights and freedoms of citizens is closely related to the active participation of citizens in political processes. In today's modern world, in relation to political life, the interests of individuals participating in political relations and processes for their own personal or narrow group interests, but the interests of citizens who are institutionalized within the framework of associations, organizations, associations, have begun to be considered as mutual actions [14].

Youth activism from the first days of Uzbekistan's independence put the issue among the main issues. Unorganized youth the issue of increasing their social activity and ensuring their employment education, having qualifications, being able to find one's place in society, society becoming a useful human being is a global, relevant issue of the present time is among the issues. Unorganized youth in recent years increasing the problems of ensuring social activity and employment Despite the growing scientific attention, its general theoretical and analysis of specific situations is one of the urgent issues. At the same time, every society has the interests of the youth the development of advanced ideas that embody is one of the urgent issues is [15].

The formation and upbringing of a sense of patriotism begins at a young age. Educated and literate young people, having a broad worldview, mastering the art of philosophical thinking, allows them to develop a national consciousness and find the right content of patriotic feelings[16]. That is why it should be the highest goal of every young person to promote the idea of loving the motherland, preserving it, and working together for its development.

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The family and the neighborhood are equally responsible for the spiritual maturity of our youth. For this, first of all, parents, neighborhood should be an example for young people in every aspect. If the family and the neighborhood work together in the spiritual education of young people, these two places of education can achieve great efficiency in the work of education. Neighborhoods play an important role in the proper upbringing of young people in the family. Because the neighborhood has been fulfilling the task of a community that unites people, has socio-political, cultural-educational and educational significance [17]. It is not without reason that some parents are irresponsible in raising their children. There are those who are axing their future when the activists of the neighborhood, elderly people give advice, what is your business? To guide Bundey parents to the right path, it will definitely require a lot of effort from neighborhood activists and enlightened people who have seen a lot.

In recent years, a number of reforms have been implemented in Uzbekistan to improve the legal basis of the neighborhood institution, to support families in need of help, to educate young people in the national spirit, and to combat the problems of unemployment among young people, as well as combating crime and delinquency various practical activities are being conducted. “The neighborhood should be a bridge between the people and the state. To always be aware of people’s joys and worries is the main task of the neighborhood” [18]. It is important to increase the responsibility of the neighborhood institution in carrying out a number of tasks set by the head of state, in particular, solving youth problems, increasing the sense of involvement in every reform in society, meaningfully organizing the free time of young people, and providing them with work. is gaining importance. This, in turn, shows the need to carry out new scientific research aimed at further developing the activities of the neighborhood institute and increasing its efficiency, as well as to further strengthen its legal basis.

In conclusion, we can say that the Uzbek people have had many children since time immemorial, and even today the majority of the Uzbek people are young people. That is why it is very important to share their thoughts and listen to their suggestions.

The reforms carried out in our country are aimed at increasing the activity of young people, as an example of this can be seen from the adopted laws and decisions, normative legal documents and programs, as well as from the tasks of the President. Because attention to youth is attention to the future. The neighborhood institute plays an important role in ensuring that young people have a good career in the future. Because the neighborhood and the people who work in it always live in the same place with them.

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VOICE MODE OF CHATGPT: A NEW SUPPORT TOOL FOR TEACHING ENGLISH IN UNIVERSITY PROGRAMS

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ABSTRACT

The integration of artificial intelligence (AI) into education has brought significant changes to traditional teaching methods, particularly in the field of language education. This study explores the impact of the "Voice Mode" feature in ChatGPT on English teaching in university programs. The "Voice Mode" allows students to interact with AI through voice, creating more natural and realistic conversations. This study aimed to evaluate the effectiveness of this technology in improving students' English communication skills compared to traditional teaching methods. A survey was conducted with 156 students from Viet - Hung Industrial University to assess the effectiveness of "Voice Mode" in enhancing English communication skills and student satisfaction. Before using "Voice Mode", only 32.1% of students had used teaching assistant technologies, and 64.1% lacked confidence in English communication activities. After using "Voice Mode", 80.2% of students participated in at least 4 class sessions, and 66.7% felt satisfied or very satisfied with the experience. The results showed a clear improvement in students' English communication ability, with 78.8% of the students experiencing moderate to significant improvement. This study highlights the potential of AI in language education and encourages the application of advanced technology to improve the quality of English teaching and learning.

KEYWORDS: *Artificial intelligence, English teaching, Voice Mode, ChatGPT, University programs*

INTRODUCTION

The development of technology in education, especially artificial intelligence (AI), has brought about significant changes in traditional teaching methods. AI not only provides personalized learning experiences but also has the ability to increase student engagement, helping students grasp knowledge more effectively. In the field of language education, AI tools can create rich and interactive learning environments, supporting students in comprehensively improving their language skills.

English is a global language that plays an important role in higher education and the labor market. Proficiency in English not only helps students access many learning and research materials but also opens up many career opportunities. However, improving English skills, particularly communication skills, remains a major challenge for many students. Therefore, it is necessary to identify effective teaching methods to support students in improving their English proficiency.

This study focuses on exploring the impact of "Voice Mode" in ChatGPT on English teaching in university programs. "Voice Mode" is a new feature of ChatGPT, allowing students to interact with AI by voice, creating more natural and realistic conversations. The goal of this study is to evaluate the effectiveness of this technology in improving students' English communication skills, comparing it with traditional teaching methods.

The study will examine various aspects of using "Voice Mode", including student satisfaction, the extent to which English skills are improved, and the overall effectiveness of this technology in the learning environment. . By evaluating these factors, this study not only provides insight into the potential of AI in language education, but also offers practical suggestions for instructors and educational administrators.

With the continuous development of technology, integrating AI into English teaching can bring new advances, helping students learn more effectively and better prepare for the future. This study hopes to contribute to the understanding of the use of AI in education and encourage the application of advanced technologies to improve the quality of English teaching and learning.

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LITERATURE REVIEW

Recent studies have shown that integrating ChatGPT into education, especially in English teaching at the university level, offers great potential. Liu (2024) emphasizes the role of ChatGPT in supporting personalized teaching and education, thanks to its strong ability to understand semantics, although also drawing attention to the limitations of understanding emotions and ethical issues. Aguiar (2024) focused on ChatGPT's flexibility, which enhances teaching effectiveness through personalized feedback and content creation, encouraging widespread adoption despite the need for further optimization. Van Horn (2024) provides insight into the impact of ChatGPT on English learning, emphasizing increased student engagement and the potential for automated learning, although also noting technical challenges . Finally, Shi's (2024) study focuses on the application of ChatGPT in spoken English teaching, finds its potential in providing personalized practice and real-time feedback, and emphasizes solutions to challenges, such as real-time communication and integration with VR technology.

However, in all these studies, there is still a lack of a clear view on the capabilities and effectiveness of "Voice Mode" in ChatGPT when applied to English teaching at university programs. Specifically, research has not fully explored how this feature can optimize students' real-life communication skills, while meeting the specific requirements and challenges of the teaching environment. Further investigation into the ability of "Voice Mode" to improve students' speaking and participation, especially in real-life communication and multi-dimensional interaction situations, remains a gap. This study attempted to explore and fill this gap.

OBJECTIVES OF THE STUDY

The study aimed to evaluate the effectiveness of "Voice Mode" in ChatGPT on improving university students' English skills. By focusing on ChatGPT's voice interaction capabilities, this study measured students' progress in language skills, especially listening and speaking. The study will analyze students' development through real-life communication activities and their level of confidence when using AI technology.

In addition, the study also aimed to survey the level of student satisfaction with using "Voice Mode". This will provide detailed insight into user perceptions and reviews of this feature, thereby providing suggestions for future improvements and developments.

RESEARCH METHODS

The study was conducted on a sample of students from Viet - Hung Industrial University, including a total of 156 students participating in a survey about the use of "Voice Mode" in English teaching. This study used a survey method to evaluate the effectiveness of this technology in improving students' English communication skills and evaluating student satisfaction and acceptance of this interactive voice feature. . Data were collected and analyzed to provide specific comments and suggestions regarding the application of the "Voice Mode" in English teaching at Viet - Hung Industrial University.

RESEARCH RESULTS

Evaluation before using "Voice Mode"

Before implementing "Voice Mode" in English teaching, the survey showed that a large number of students had never used teaching assistant technologies in the learning process. Specifically, only 32.1% (50 students) had ever used teaching assistant technology, while up to 67.9% (106 students) had never used it. This shows that most students are still quite new to applying technology in learning English. The level of confidence of students in English communication activities was also quite diverse: only 29.5% (46 students) felt confident or very confident, while the majority of students (64.1%) only felt confident or very confident. at a normal level, or not confident. Comfort in using new technology was also highly rated, with 46.2% (72 students) feeling comfortable or very comfortable, indicating a certain level of acceptance towards innovation.

Evaluation after using "Voice Mode"

After using "Voice Mode" for a period of time, results showed that the majority of students participated in at least 4 class sessions with this technology. Specifically, 80.2% of the students participated in four or more sessions, with 19.2% (30 students) participating in more than 10 sessions. This shows the students' commitment and interest in the new technology. Regarding satisfaction level, 66.7% (104 students) felt satisfied or very satisfied with the experience of using "Voice Mode", while only 10.3% (16 students) felt dissatisfied. This shows that "Voice Mode" has achieved positive acceptance from students.

Level of improvement in English communication ability

Survey results also showed a clear improvement in students' English communication ability after using "Voice Mode". Up to 65.4% (102 students) felt that their communication ability had improved significantly, while only 7.7% (12 students) thought that there was

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little or no improvement. This confirms that "Voice Mode" has had a positive impact on students' communication skills, helping them become more confident in using English.

Compare effectiveness with traditional teaching methods
When comparing the effectiveness of "Voice Mode" with traditional teaching methods, the results show a clear superiority of new technology. Up to 65.4% (102 students) thought that the Voice Mode was more effective or much more effective than the traditional method, while only 6.4% (10 students) thought that it was less effective. This shows that "Voice Mode" is not only accepted but also highly appreciated for its effectiveness in improving students' skills and learning experiences.

DISCUSSION

The survey results show that implementing ChatGPT's "Voice Mode" in English teaching at Viet – Hung Industrial University has brought many significant benefits. First, although the majority of students had not initially used teaching assistive technologies, they demonstrated quick adaptation and acceptance of this new technology. This proves that students are receptive and willing to experience modern teaching methods, as long as these methods are truly useful and improve their learning experience.

A notable point is the obvious improvement in students' English communication skills. With more than 65% of students feeling their communication ability improved a lot or a lot, "Voice Mode" has proven its superior effectiveness compared to traditional teaching methods. This not only helps students be more confident in using English but also motivates them to participate more actively in communication activities in the classroom.

Besides, using "Voice Mode" also brings a high level of satisfaction to students. With 66.7% of students feeling satisfied or very satisfied, it can be seen that their learning experience has improved significantly. This may stem from the flexible and personalized interaction capabilities of AI technology, which helps students feel more comfortable and interested in the learning process.

However, it should be noted that a small number of students still felt uncomfortable or dissatisfied with this new technology. This may be because they are not familiar with applying technology to learning or have difficulty using "Voice Mode". Therefore, additional support measures and specific guidance are needed to ensure that all students can take full advantage of the benefits of technology.

In summary, ChatGPT's "Voice Mode" has demonstrated great potential in improving English communication skills and enhancing students' learning experience. The results of this survey encourage the continued development and application of AI technologies in education, to bring about more effective and suitable teaching methods to the needs of modern students.

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MANAGEMENT OF *TAMAKA SHWASA*: A CASE STUDY

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ABSTRACT
Tamaka Shwasa is one of the Pranavaha Sroto Vikara which is generally described as Yapya Vyadhi or Krichra Sadhya. However, the patient has Pravara Bala, recent origin of disease or both said to be Sadhya. Therefore, proper line of treatment and proper lifestyle is required for this disease. It is analogous to Bronchial Asthma which is prevalent in 13.1% of population all over the world. This is a single case study of a 27-year-old male patient came with difficulty in breathing since 1 year. He also complaints of repeated sneezing, acidity, cough, nasal congestion and wheezing at night. According to patient, he was apparently well before 1 year and gradually he developed breathing difficulty. It was treated by internal Ayurvedic medicines and got significant improvement. Present case study emphasizes the effect of Vyadhihara Chikitsa like Tab Shwasa Kutara Rasa, Tab Amlant, Cap Grab, Tab Allerin and external medications like Sthanika Abhyanga with Brihat Saindhava Taila and Nadi Sweda with Dashamoola Kwatha, Nasya with Anutaila, Avagundana, Nebulization with Helin capsule and Shodhana by means of Sadyo Vamana for its effect on expelling out the vitiated Kapha Dosha and Pranayama for providing symptomatic relief in Tamaka Shwasa.

KEY WORDS: *Tamaka Shwasa, Bronchial Asthma, Vyadhihara Chikitsa, Shodhana, Sadhyo Vamana*

INTRODUCTION

Tamaka Shwasa is one among the *Pancha Vidha Shwasa*. The word Tamaka is derived from *Dhatu Tamalganou* which means sadness. *Tamaka Shwasa* is *Kapha Vataja Vikara* and site of origin is *Pitta Sthana*[1].The main *Lakshanas* of *Tamaka Shwasa* are *Ghurguraka Shabda, Peenasa, Shiro Gurutwa, Aaseene Labhate Sukham, Shayanaha Shwasa Peeditha*[2]. Its analogues with bronchial

asthma where remarkable features are wheezing, breathlessness and cough. Bronchial asthma is one of the most distressing diseases and it is quite common among all socio-economic status people, in all age groups. That's an insightful perspective from *Ayurveda* on the pathogenesis of *Tamaka Shwasa*.

The concept of *Agni* plays a crucial role in *Ayurveda* and when it is weakened due to faulty food habits, it can lead to various health issues including respiratory problems like *Tamaka Shwasa*. In this context, *Annanaha Srotodushti* refers to the imbalance or impairment of the channels responsible for digestion and metabolism due to improper food habits. This disturbance in the digestive process leads to the accumulation of toxins (*Ama*) and aggravation of *Doshas* particularly *Pitta* and *Kapha. Tamaka Shwasa* is believed to originate primarily from the *Pitta Sthana* and then localizes in the *Kapha Sthana*[3]. This condition is characterized by an imbalance of both *Kapha* and *Vata Doshas* with *Kapha* dominating. According to *Ayurvedic* principles, when there is an imbalance in these *Doshas* particularly aggravated *Kapha* and *Vata*, it leads to respiratory issues like asthma. The vitiation of *Kapha* and *Vata* ultimately affects the *Pitta Sthana*, contributing to the manifestation of *Tamaka Shwasa*.

Ayurveda offers holistic approaches to manage such conditions, focusing on balancing the *Doshas* through lifestyle modifications, dietary changes, herbal remedies, and practices like *Yoga* and *Pranayama* to strengthen the respiratory system and improve overall health. The treatment of *Shwasa Roga* emphasizes the importance of medicines and dietary regimens that have the properties of *Ushna* which helps to balance *Kapha* and *Vata Doshas*. These remedies should also possess *Vatanulomana* properties to effectively manage the condition. In *Ayurveda*, treatment approaches are categorized into different levels based on their intensity and purpose. *Brhmana*, which refers to nourishing and strengthening therapies is considered the foremost and most effective level of treatment. These therapies aim to build up the body's strength and immunity which is crucial in managing chronic conditions like *Tamaka Shwasa*. While modern medications may provide temporary symptomatic relief, they often fall short in providing long-term relief without dependency. *Ayurveda* on the other hand, offers a comprehensive approach that not only addresses the symptoms but also focuses on restoring balance to the

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body's systems. By incorporating *Sodhana* treatments alongside internal medications, *Ayurveda* aims to detoxify the body, provide essential nutrition, and enhance the patient's immunity.

These treatments not only alleviate the symptoms but also improve the elasticity of lung tissues, contributing to long-term relief and well-being. *Ayurveda's* holistic approach to managing *Tamaka Shwasa* can offer patients a safe and effective alternative, reducing the need for drug dependency and promoting overall health and vitality. Hence *Ayurveda* treatment by *Vyadhihara Chikitsa* and *Shodhana Karmas* needs to be evaluated. So, in this particular case *Vyadhihara Chikitsa* like *Shwasakudara Rasa*, Tab Amlant, Cap Grab, Tab Allerin were advised and external medications like *Sthanika Abhyanga* with *Brihat Saindhava Taila* and *Nadi Sweda* with *Dashamoola Kwatha*, *Nasya* with *Anutaila*, *Mukha Avagundana*, Nebulization with Helin capsule and *Sadhyo Vamana* was given as *Shodhana Chikitsa.*

CASE STUDY

A 27-year-old male was reported to fever and respiratory outpatient department of Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan on 10th February 2024 with complaints of breathlessness, acidity, repeated sneezing, wheezing at night since 1 year.

HISTORY OF PRESENT ILLNESS

Patient was apparently healthy 1 year back. He had an acute onset of repeated sneezing and difficulty in breathing associated with cough and nasal congestion and wheezing at night for which patient took allopathic medication and symptoms get reduced temporarily. He used to suffer on and off with same complaints and get temporary relief on medications. As the recurrence of symptoms, he consulted SDM Ayurveda hospital Hassan on 10th February 2024 and patient was advised to undergo admission for treatments.

PAST HISTORY

N/K/C/O DM and Hypertension.
K/C/O Grade 2 Fatty liver

PERSONAL HISTORY

Appetite: Altered
Bowel: 1-2 times per day
Micturition: Regular
Sleep: Disturbed due to Wheezing
Habits: Regular intake of Curd, Fried oily foods, Alcohol
Habitat: Lives in dusty area

FAMILY HISTORY

Nothing specific

LOCAL EXAMINATION

1. External nose
   Inspection: No visible scar, swelling
   Palpation: No tenderness
   Nasal septum: No deviation
   Vestibule: No fissure and crusting
2. Anterior Rhinoscopy
   Nasal passage: Narrow on right nose
   Floor: No defects
   Roof: Not visible
   Lateral wall: Mucosa-Congested
   Turbinate-Hypertrophy of right inferior turbinate
   Discharge-Yellow mucopurulent nasal discharge
3. Respiratory system
   Inspection: Chest- Bilateral symmetrical

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No any chest deformities
No any scars
Respiratory rate-18 per min

Palpation: Tenderness absent
Percussion: Resonant all over the lung field
Auscultation: Polyphonic wheeze bilaterally (wheezing is more evident in Right lung than Left lung)

4. Sinus Examination
Maxillary sinus: Little tenderness present
Frontal sinus: Tenderness and swelling present
Ethmoid sinus: Tenderness in the root of nose and above the upper eyelids

ASHTASTHANA PAREEKSHA

Nadi: 75bpm
Moothra: 3-4 times per day
Mala: 1-2 times in a day
Jihwa: *Alipta*
Shabda: Madhyama
Sparsha: Anushna sheeta
Druk: Madhyama
Aakruti: Madhyama

DASHAVIDHA PAREEKSHA

Prakruti: Pitta Kapha
Vikruti: Dosha- Prana Vata, Avalambaka Kapha
Dooshya- Rasa, Rakta

Saara: Madhyama
Samhanana: Madhyama
Pramana: Height-150 cm
Weight-65 kg
BMI-28.9
Satwa: Avara
Satmya: Sarva rasa satmya
Aahara sakthi: Madhyama
Vyayama sakthi: Madhyama
Vaya: Madhyama

MATERIALS AND METHODS

- Source of data
  Patient suffering from Tamaka shwasa is selected from IPD of SDMCAH, Hassan
  IP No: IP 073187, Ward: Charaka Male ward
- Study design
  A single case study

TREATMENT

Vyadhihara Chikitsa
1. Tab.*Shwasa Kutara Rasa* 1 TID after food
2. Tab.Amlant 1 BD after food
3. Tab. Allerin 1 TID after food
4. Cap. Grab

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Shodhna Chikitsa
1. Sthanika Abhyanga with *Brihat Saindhava Taila* followed by *Nadi Sweda* with *Dashamoola Kwatha*
2. Nasya with *Anutaila*
3. Nebulization with Helin capsule
4. Mukha Avagundana
5. Sadhyo Vamana

The previous night before *Sadhyo Vamana, Kapha Utkleshakara Ahara* such as curds and sweets were given to the patient and instructed to sleep for 6-8 hours. On the day of *Vamana,* after assessing the vitals and bowel movements, patient was explained about the procedure. *Vamana* was given using *Yashti Madhu Phanta* and 7 *Vegas* were observed. *Ushna Jala Kabala* and *Haridra Varti Dhumapana* were given as post treatment regimen. Patient was advised not to do *Divaswapna, Sheeta Vata Sevana*, *Vegadharana* and to take *Ushna Jala Pana* and *Laghu Ahara* in the afternoon and evening.

Discharge Medicines (For 15 days)
1. Tab *Shwasa Kutara Rasa* 1 TID after food
2. Cap GRAB 1 TID after food
3. Tab Allerin 1 TID after food
4. Tab Amlant 1 BD after food

RESULTS AND DISCUSSION

Patient had irregular dietary habits of excess use of curds and intake of alcohol. He lives in a place which is polluted, smoky and dusty. This might be the probable cause for developing *Tamaka Shwasa*. The medicines and procedures which mainly acts on alleviating *Vata-Kapha Dosha* were chosen.

***Shwasa Kutara Rasa*-** counteracts the symptoms of *Tamaka Shwasa* due to the action of its ingredients which directly act on *Pranavaha Srotas*. *Shwasakuthar Rasa* is a herbomineral drug

and it contains minerals such as *Parada* (mercury), *Gandhaka* (sulphur), *Tankana* (borax) and *Manahshila* (arsenic sulphide) in purified form and herbs like purified *Vatsanabha* (aconitum ferox), *Pippali* (piper longum), *Maricha* (piper nigrum) and *Shunthi* (zingiber officinale) as per *Ayurvedic* text. All the drugs of *Shwasa Kutara Rasa* have *Ushna Veerya* and *Vata-Kaphahara* properties. *Vata* and *Kapha* are the main *Doshas* which are involved in *Tamaka Shwasa Samprapti* and this formulation is having *Kapha-Vatashamaka Karma* due to its *Katu Rasa, Tikshna-Vyavayi-Vikasi Guna, Katu Vipaka* and *Ushna Veerya*. Its most of the ingredients are mainly *Kapha-Nihsaraka* with *Laghu, Ruksha* and *Ushna Guna*, therefore it mainly acts on *Agnimandhya* and breaks the *Kapha Dosha Pradhana Samprapti* of *Tamaka Shwasa* and makes relieve in symptoms of *Tamaka Shwasa*[4].

Cap Grab- Contains *Vranapahari Rasa, Triphalaguggulu, Gandaka Rasayana, Arogyavardhini Rasa, Guduchi, Manjishta*. It controls viral infections, reduces respiratory stress, combats infections intensely, *Guduchi* enhances immunity, *Arogyavardhini* promotes digestive fire, *Gandaka Rasayana* act as immuno modulator, *Vranapahari Rasa* mainly indicated in *Shwasa, Kasa Chikitsa*[5].

Tab Allerin- It is a combination of formulations like *Gandhaka Rasayana* and *Kaishora Guggulu* along with *Manjishtadi Gana, Udichya, Anantamoola, Chopachini* and *Bakuchi. Kaishora Guggulu contains Guduchi, Pippali, Maricha* and *Shunti* and *Guggulu. Guduchi* is antiallergic, immunomodulatory, anti-oxidant and anti-inflammatory *Gandhaka Rasayana* contains *Gandhaka, Twak, Ela, Patra, Nagakesara, Guduchi, Triphala, Bhringaraja, Ardraka* triturated with Cow's milk. *Gandhaka is Kaphavatahara. Twak* has anti-inflammatory and anti-microbial property. *Ela, Patra and Nagakesara* are anti-inflammatory, analgesic and antibacterial. *Triphala* is potent analgesic. *Bhringaraja* is analgesic and anti-bacterial. *Ardraka* is anti-inflammatory[6].

Tab.Amlant- It is a natural antacid and anti-ulcerative tablet that helps in treating hyper acidity. The tablet contains *Sunti, Pippali, Haritaki, Swetha Parpati,Muleti* etc which balancing *Pitta Dosha* and reducing inflammation and promoting digestive health.

***Sthanika Abyanga* with *Brihat Saindhava Taila* followed by *Nadi Sweda* with *Dashamoola Kwatha*-** This therapy renders the adhered *Kapha* dissolved in the channel of circulation and soften there by. These therapies also cause downward movement of *Vata* (*Vatanulomana*). The stable *Kapha* in the body get dissolved on account of the heat generated by these fomentation therapies.

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***Nasya* with *Anutaila*-** *Pratimarsha nasyam* is given with *Anu Taila* because *Anu Taila is Sneha Virechanam.* It reduces vitiated *Vata* and *Kapha Doshas.*

Nebulization with Helin Capsule-It is specifically formulated to support respiratory health. Ingredients are *Sugandha Pathram* (Eucalyptus globulus), *Pudina* (Mentha piperita), *Lavanga* (Sizygium aromaticum), *Karpooram* (Cinnomomum camphiora), *Pudina satwam* (Mentha piperita). It relieves congestion and cough, supports respiratory health, promotes clear breathing,Helps in expelling mucus and phlegm from the respiratory tract and reduces inflammation in the airways. It has broncho dilatory properties to ease breathing.

Mukha Avagundana- *Avagundana*- A pouch containing crushed *Dhanyaka*, *Tulasi* and *Haridra* dipped *in Dhanyamla* was used to apply over the facial areas where patient experienced pain and tenderness to relieve the above symptoms.

Sadhyo Vamana- During the time of admission, the patient was given *Sadhyo Vamana*, with *Yashtimadhu Phanta* and *Saindhava Lavana* since all the *Doshas* are in *Utkleshaavastha* where *Shodhana* can be done without doing any *Poorvakarma*.

CLINICAL ASSESSMENT

Assessment Criteria:

Subjective Parameters

The symptoms are graded as 0 to 3, 0 being absence of the clinical feature and 3 being severe.

Objective Parameters

Signs	Before Treatment	After Treatment
Inferior turbinate hypertrophy	Severe	Mild
Tenderness in frontal and ethmoid sinus	Moderate	Mild
Nasal mucosa inflammation	Severe	Mild
Wheezing	Severe	Mild

Symptoms	Before treatment	After treatment
Nasal obstruction	3	1
Nasal discharge	2	1
wheezing	3	1
sneezing	3	1
Night awakening	3	1

CONCLUSION

After analysis of all data, it is concluded that, Tab.*Shwasa Kutara Rasa*, Cap Grab, Tab Allerin, Tab Amlant, *Sthanika Abhyanga* with *Brihat Saindhava Taila* followed by *Nadi Sweda* with *Dashamoola Kwatha*, *Nasya* with *Anutaila*, Nebulization with Helin capsule, *Mukha Avagundana*, *Sadhyo Vamana* are effective in management of *Tamaka Shwasa*.

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STUDENT'S SELF-ESTEEM AND SELF-CONTROL AS PREDICTORS OF ACADEMIC ACHIEVEMENT OF STUDENTS IN MATHEMATICS

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ABSTRACT
This study aimed to determine whether self-esteem and self-control significantly influence the student's academic achievement in mathematics. A descriptive-correlational research design was used. The respondents of this study were 310 Grade 10 students in five public secondary high schools in the Division of Davao del Norte and were chosen through stratified random sampling. This study used three adopted questionnaires. Mean, Standard Deviation, Pearson r, and Regression Analysis were used as statistical tools. The findings showed that student's self-esteem was fairly manifested while student's self-control was fairly observed. The academic achievement of grade 10 students in mathematics did not meet expectations. The findings also revealed that both self-esteem and self-control have a significant relationship on students' academic achievement in mathematics. The findings also demonstrated that self-control is a significant predictor of academic achievement in mathematics but not self-esteem. The results emphasized that educators and school administrators should focus on enhancing social and physical acceptance, addressing procrastination, attention control, and impulse control, and boosting mathematics achievement. These interventions may include teamwork activities, body positivity programs, and creating a safe space for discussing social anxieties. Strategies may include time management workshops, mindfulness exercises, and role-playing scenarios. Future research could explore the link between self-control and mathematics achievement, suggesting that incorporating self-control strategies into classrooms, effective study time planning and focused teaching techniques could improve test scores.

KEYWORDS: *Math education, self-esteem, self-control, mathematics achievement, descriptive and correlational design, regression analysis, Davao del Norte, Philippines*

INTRODUCTION
In education, there has been a concern on mathematics achievement of students, particularly in certain countries where students are consistently performing below expectations (Newton, et al, 2019). According to Nabizadeh et al. (2019), the ability to demonstrate academic achievement through the attainment of the desired objective is an essential component of academic progress. Nevertheless, despite mathematics' widely accepted importance and the fact that it is a requirement for many courses, poor academic attainment among learners remains an issue in both industrialized and developing the educational institutions of the nation (Sharma et al., 2018). Moreover, research suggests that low mathematics achievement is still a problem not only in the Philippines but also in other countries (Andrade & Gutiérrez-García, 2020).

In Indonesia, the results in Programme for International Student Assessment (PISA) for mathematics went down, from 60th placed out of 72 countries in 2015 to 72nd placed out of 79 countries in 2018. It is abundantly evident that the rank implies a real problem in the subject of mathematics (Efendi & Kismiantini, 2022). Similar problems have been experienced by the students in Thailand, 53% did not meet the minimum academic requirement for mathematics in PISA 2018, which is significantly higher than the average of less than 30% of students across the Organization for Economic Cooperation and Development (OECD) (World Bank, 2021). Additionally, in T anzania, Africa, according to the National Examinations Council of Tanzania (NECTA), the state of students' mathematics academic achievement of the country is very poor, with an average rate of 19.54% (The Citizen, 2021). It indicates that students failed the subject and showed a significant failure rate in mathematics in the country (Kihwele & Mkomwa, 2022).

In the Philippines, a study conducted by Bernardo et al. (2022) found that students' low achievement in mathematics is a really big issue in the Philippines. Moreover, the country of the Philippines finished second to last among those taking part in the latest Programme for International Student Assessment (PISA) 2018. This alarming discovery revealed that Filipino learners had a mean score in mathematical literacy of 353 points, which was significantly less than the OECD average of 489 points. Additionally, only 19.7% of Filipino learners, or 1 in 5, are said to have reached the required level of math skills (Callaman & Itaas, 2020). Additionally,

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the mathematical achievement exam results of Filipino students in International Mathematics and Science Studies (TIMSS) 2019 were much lower than those of our neighboring countries like Singapore, Taiwan, and Korea (Tan, 2021). Furthermore, similar results are shown in the study of Gonzales (2019), that the proficiency level of Filipino students in the National Achievement Test (NAT) has declined, particularly in the subject of mathematics.

In the Division of Davao del Norte particularly in Carmen District, students from public junior high schools scored poorly on the mathematics proficiency test during the first quarter examination for the school year 2022–2023. This was reflected in the student's examination scores. The mean percentage score (MPS) of the students is 69.24%, which is lower than the standard mean percentage score, which is 75%, which results in a low proficiency level. Additionally, the National Achievement Test (NAT) average results for Carmen District students dropped from 78.02 percent in 2017 to 70.96 percent in 2018, particularly in mathematics (Cruda, 2022).

This study explored the association between students' self-esteem and academic achievement (Ramirez-Castillo et al., 2018), as well as the link between self-control and academic achievement (Duckworth et al., 2019). Despite the existence of several studies on the association between self-esteem and academic success (Nasseer-Abu & Rahamim, 2020; Aryana, 2010; Subon et al., 2020), and between self-control and academic achievement (Jung et al., 2017; Fernandez & Rice, 2018), there remained a significant gap in our understanding of the specific impact of these factors on Junior High School students' mathematical achievement. This is mainly manifest in the lack of empirical reports that examine the direct relationship between self-esteem, self-control, and mathematical achievement, particularly in the Junior High School setting. Further investigation is needed to understand the mechanisms more fully through which self-esteem and self-control influence mathematical achievement and to inform interventions aimed at promoting positive outcomes in this critical area of development among students experiencing new normal education, particularly in the context of the global pandemic.

OBJECTIVES

The purpose of the investigation was to see if the Grade 10 students' self-esteem and self-control impact their academic achievement in mathematics at five public schools in Davao del Norte for the school year 2023-2024. Specifically, this study aimed to answer the following questions.

1. What is the level of the learners' self-esteem in terms of self-acceptance, self-competence, social and physical self-acceptance and academic self-competence.
2. What is the level of the self-control of learners in terms of procrastination, attentional control, impulse control, emotional control, goal orientation, and self-control strategies
3. What is the level of academic achievement of grade 10 learners in terms of summative score in grade ten (10) Mathematics subject?
4. Is there a significant relationship between (a) self-esteem and academic achievement of grade 10 learners in mathematics and (b) self-control and academic achievement of grade 10 students in mathematics?
5. Do self-esteem and self-control significantly influence the academic achievement of grade 10 learners in mathematics?

METHODOLOGY

Research Design

This quantitative non-experimental research utilized the descriptive and correlational approach. The researcher used this approach to ensure the effectiveness of attaining the general objectives of the study and to guarantee the suitability of the study approach pertaining to possible data results of the study.

Descriptive approach is a type of quantitative research approach with the purpose of summarizing, organizing, and displaying data that describes characteristics of a population or phenomenon. It does not aim to explain or analyze the data or answer questions about cause and effect, but rather to simply describe the data. Its data can be collected through surveys, observational studies, and interviews. The data is then organized and presented in tables, charts, and other descriptive forms (Mohammad et al., 2020).

Correlational research is a type of research method that investigates the relationship between two or more variables. This approach is used to study cause and effect relationships between variables, and to make predictions about future events. This approach is used to determine if two variables are related and to what degree but does not identify the strength of the relationship or the cause of the relationship (Garcia et al., 2020). On the other hand, non-experimental quantitative design is a type of research that does not involve manipulation or control of the environment, but instead seeks to investigate relationships between variables. It is most often used in surveys and correlational studies, where the researcher collects data from different participants or groups and then looks for patterns or relationships between the variables (Cooper, 2019).

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Furthermore, the role of regression analysis in this investigation is to identify the extent to which self-esteem and self-control predict academic achievement in mathematics. In this study, regression analysis was employed in this study to identify the intensity and pace of the correlation among self-esteem, self-control, and academic achievement in mathematics. The findings of regression analysis were used to determine the extent to which self-esteem and self-control are important predictors of academic achievement in mathematics, and whether the relationship between these variables is linear or nonlinear.

Sampling Design

The respondents in this investigation were the Grade 10 junior high school students who were enrolled in the SY 2023-2024 of five public schools in the Division of Davao del Norte. They were identified as schools A, B, C, D, and E. The researcher utilized the Qualtrics online sample size calculator in determining the final number of respondents for the entire study. By allowing a 95% confidence level, and a 5% margin of error, it is identified that the ideal sample size for this study will be 301 students out of 1,370 population size. There were 1,370 grade 10 students in all throughout the five chosen schools, with 870 in school A, 150 in school B, 100 in school C, 160 in school D, and 90 in school E. Investigators used stratified random sampling when they sought to study data from various subgroups or categories. This method allowed them to attain a sample demographic that precisely represented the entire group being examined (Qualtrics, 2022). This sample size was then proportionally distributed across the five schools based on their populations, resulting in the following allotment: School A had 191 respondents, School B had 33, School C had 22, School D had 35 and School E had 20.

Research Instrument

This study utilized two adapted research instruments and a researcher-made summative test in mathematics 10. The researcher modified these instruments to align with the overall objectives of the study. Additionally, a panel of experts validated these instruments, and ensured that an appropriate tool is used to obtain the data. Pilot testing was conducted to check the reliability of the instrument.

Self-Esteem Scale (SES). In measuring students' self-esteem, the researcher utilized an adapted instrument titled Self-Esteem Scale developed by Rifai et al. (1999). The scale consisted of 29 items. These items represented its four dimensions: Self-acceptance (9 items), Self-competence (8 items), Social and Physical Self-acceptance (6 items), and Academic Self-competence (6 items).

Multidimensional Self-Control Scale (MSCS). The researcher employed an adapted questionnaire survey to explore student individual differences in self-control. This survey, the Multidimensional Self-Control Scale (MSCS) developed by Nilsen et al. (2020), consisted of 29 items that measured six (6) factors: procrastination (5 items), attentional control (5 items), impulse control (5 items), Emotional Control (4 items), Goal Orientation (4 items), and Self-Control Strategies (6 items).

Mathematics Summative Test (MST). The researcher created a 40-item summative test to assess the students' academic achievement in Mathematics 10. The items were made according to the mathematics 10 module. The coverage was only on Math 10 contents in Algebra, plane, and solid geometry based on the MELCs. Specifically, it consisted of 30% easy questions, 40% average questions, and 30% for difficult questions. Moreover, the table of specifications reflected the results of the summative test.

Statistical Design

To analyze and understand the data, the following statistical methods were employed:
Mean. This was also known as an arithmetic mean, which was a value that helped summarize a large
number set. This tool for statistics was employed to determine the level of students' self-esteem, self- control, and academic achievement in mathematics 10.

Standard Deviation. A standard deviation was an estimation of the dispersion of a data collection in relation to its mean. This statistical tool was utilized to find out if the scores were equally distributed or if they were near to the mean.

Pearson-r. Pearson-r was a measure of correlation used to evaluate the strength of a linear relationship between two variables. This analysis of statistics was used to determine the presence of a relevant relationship among the students' self-esteem and academic achievement in mathematics 10, self-control and academic achievement in mathematics 10.

Multiple Regression Analysis. Regression analysis was employed as a set of methods for statistical analysis to investigate the relationships between various factors. This technique was used to determine the significant influence of learners' self-esteem and self-control on academic achievement in Mathematics 10.

RESULTS

1. For the level of self-esteem, among its four (4) indicators, self-acceptance has the highest mean of 3.67, a standard deviation of 0.72, with a descriptive equivalent of high. This indicates a moderately high level of self-acceptance on average, with

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some variation among students. This is followed by self-competence with a mean of 3.31, a standard deviation of 0.60, with a descriptive equivalent of moderate. On the other hand, students scored lowest in Social and Physical Acceptance with a mean of 3.06 and a standard deviation of 0.75. This suggested a moderate level of self-esteem on average in social and physical acceptance but with a wider range of scores compared to self-acceptance. The overall mean on the level of students' self-esteem is 3.33 with a descriptive equivalent of moderate and a standard deviation of 0.56.

2. For the level of self-control, among its indicators, it is noted that students scored highest in Emotional Control with a mean of 3.74 and a standard deviation of 0.82, indicating a high level of self-control in this area. The students also showed high self-control in Goal Orientation with a mean of 3.69 and a standard deviation of 0.89); and Self-Control Strategies with a mean of 3.69, and a standard deviation of 0.94. On the other hand, Procrastination, Attentional Control, and Impulse Control had lower means (3.08) and lower standard deviations (0.56) compared to the top three. These scores translated to a moderate level of self-control. The overall mean on the level of students' self-control is 3.40 with a descriptive equivalent of moderate and a standard deviation of 0.55.

3. For the level of the status of academic achievement of students in mathematics, the average score on the math assessment was 33.36. The standard deviation was 10.28, indicating a spread of scores around the mean. Based on the results, academic achievement in mathematics fell below expectations.

4. For the relationship of all variables, self-esteem was found to have a statistically significant positive relationship with math achievement, indicating that students with higher levels of self-esteem tend to achieve better in mathematics. The correlation coefficient ($r = 0.235$) suggests a weak to moderate positive correlation between self-esteem and math achievement.

5. On the other hand, self-control also showed a statistically significant positive relationship with math achievement. Students who exhibit greater self-control tend to achieve higher scores in mathematics, as indicated by a correlation coefficient ($r = 0.272$) reflecting a weak to moderate positive correlation.

6. For the influence, self-control is a significant predictor of students' academic achievement in mathematics, supported by a p-value of 0.002, which is below the significance level ($\alpha = 0.05$). This indicates a statistically significant relationship, suggesting that students with higher levels of self-control achieve better in mathematics. On the other hand, self-esteem has a p-value of 0.057, a bit higher than the significance level. While there is a positive trend suggesting that higher self-esteem scores are associated with better achievement, it cannot be definitively concluded that self-esteem is a significant predictor at the chosen significance level. The overall model is statistically significant, as indicated by an F-ratio of 13.911 with a p-value of 0.000, much lower than 0.05, demonstrating that self-esteem ($\beta1$) and self-control ($\beta2$) collectively explain a statistically significant portion of the variance in mathematics achievement scores (Adjusted R-squared = 0.079). The regression formula used, Math Achievement = $\beta0 + \beta1 \times$ Self-esteem + $\beta2 \times$ Self-control + ε, confirms its influences.

SUGGESTION

Educators may focus on enhancing social and physical acceptance. Given that this indicator has the lowest score, interventions may target improving students' feelings of acceptance from peers and good body image. This may involve social activities that promote teamwork and cooperation; educational programs on body positivity and healthy self-image; and creating a safe space for students to discuss social anxieties. School administrators may also address procrastination, attention control, and impulse control among students. While the overall self-control is moderate, these specific areas may need improvement. Strategies may include time management workshops to combat procrastination; mindfulness exercises to improve focus and attention control; and role-playing scenarios to practice resisting impulsive decisions among students. Students, with overall mathematics achievement falling below expectations, there is a clear need for improvement. Addressing this could involve offering personalized tutoring or small group support to assist struggling students, designing math lessons that are engaging and applicable to real-world scenarios, and implementing positive reinforcement strategies to celebrate and encourage students' progress. Future research may leverage the link between self-control and mathematics achievement. Given that self-control is a significant predictor of mathematics achievement, promoting these skills may have a positive impact on test scores among students. Therefore, this may include integrating the self-control strategies mentioned above into math classrooms; encouraging students to plan their study time effectively for mathematics; and teaching techniques for staying focused during mathematics lessons.

CONCLUSION

Students' self-esteem was fairly manifested. Students' self-control was fairly observed. Students' academic achievement in mathematics did not meet expectations. Both self-esteem and self-control had statistically significant positive relationships with students' mathematics achievement. Self-control is a significant predictor of academic achievement in mathematics, whereas self-esteem shows a positive trend but does not predict academic achievement in mathematics.

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Figures

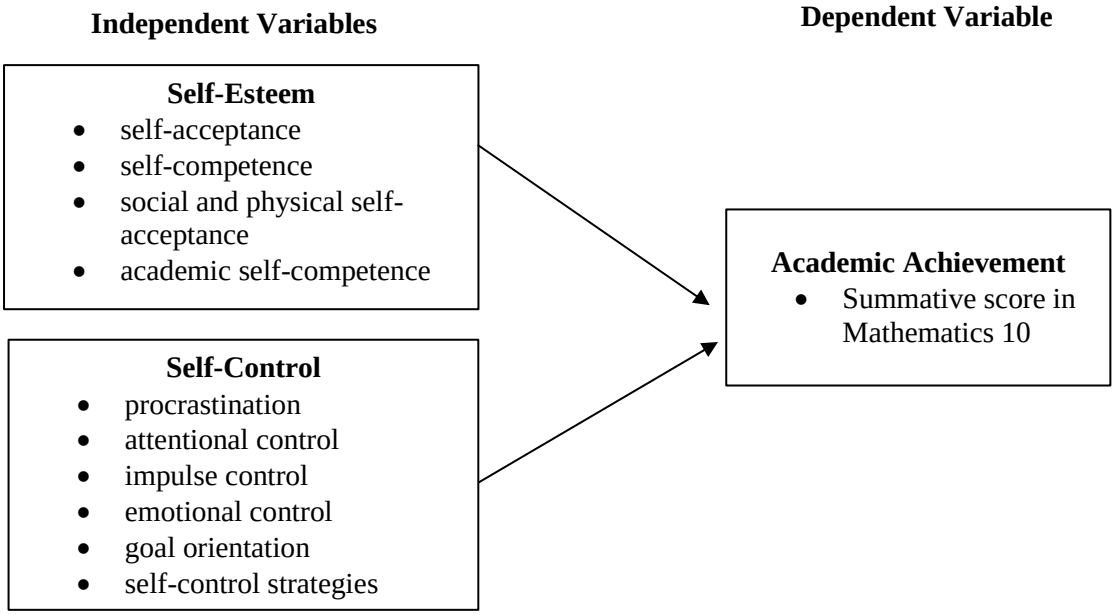


Figure 1. Conceptual Framework of the Study



Source: https://google.com/maps/davaodelnorte

Figure 2. Local Map of the Division of Davao del Norte.

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TABLES

Table 1. Level of Self-Esteem of the Students

Indicators	Mean	SD	Description Equivalent
Self-Acceptance	3.67	0.72	High
Self-Competence	3.31	0.60	Moderate
Social and Physical Acceptance	3.06	0.75	Moderate
Academic Self-Competence	3.26	0.75	Moderate
Overall Category Mean	**3.33**	**0.56**	**Moderate**

Table 2. Level of Self-Control of the Students

Indicators	Mean	SD	Descriptive Equivalent
Procrastination	3.08	0.56	Moderate
Attentional Control	3.24	0.60	Moderate
Impulse Control	3.08	0.56	Moderate
Emotional Control	3.74	0.82	High
Goal Orientation	3.69	0.89	High
Self-Control Strategies	3.69	0.94	High
Overall Category Mean	**3.40**	**0.55**	**Moderate**

Table 3. Status of Academic Achievement of Students in Mathematics

Variable	Mean	SD	Descriptive Equivalent
Academic Achievement in Mathematics	33.36	10.28	Did not Meet Expectation

Table 4. Significance of the Relationship Between Self-Esteem and Self-Control towards Academic Achievement of Students in Mathematics

Variables Correlated	r	p-value	Decision on Ho	Decision on Relationship
Between Self-Esteem & Academic Achievement of Students in Mathematics	0.235	0.000	Reject Ho	Significant
Self-Control & Academic Achievement of Students in Mathematics	0.272	0.000	Reject Ho	Significant

Table 5. Regression Analysis on the Students' Self-Esteem and Self-Control as Predictors of Academic Achievement of Students in Mathematics

Independent Variables	Unstandardized Coefficients		Standardized Coefficients	t-stat	p-value	Decision@ α = 0.05
	β	Standard Error	B			
(Constant)	12.523	4.019				
Self-Esteem	2.344	1.227	0.125	1.910	0.057	Not Rejected
Self-Control	3.839	1.223	0.206	3.139	0.002	Rejected

Dependent Variable: Mathematics Achievement
Adjusted R Square: 0.079
F-ratio: 13.911
p-value: 0.000

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ADDRESSING GAPS IN QUALITY TEACHING: ASSESSING TEACHERS' NEEDS AS BASIS FOR A PROFESSIONAL DEVELOPMENT EXTENSION PROGRAM

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ABSTRACT
This study aimed to assess the training needs of High School Teachers in Bunawan, Agusan del Sur. The result of this study lays the foundation for the development of the Professional Development Extension Program. This study employed a descriptive research approach, a survey questionnaire adhering to ISO: 2015 standards was utilized to draw responses from 18 high school teachers selected through purposive sampling. Data analysis incorporated descriptive statistics. The majority of teachers in Bunawan, Agusan del Sur are under 21-30 years old, female, with a master's degree, serving 7-9 years, and holding Teacher I rank. Most individuals have specializations, with Science Teachers being the largest group, with West Bunawan National High School having the most of these individuals. Furthermore, the Training preference of the teachers is the Preparation of Strategic Intervention Materials (SIM) to enhance students' performance. The least learned competencies in mathematics include operations on integers, basic and fundamentals while reading comprehension in English and projectile motion, impulse and momentum, and conservation of linear momentum in Science. For the parents and stakeholders to support quality education, it was revealed that they mostly need training related to financial management and literacy as well as in empowering basic literacy to aid learners in the take-home activities. Lastly, the Training needs of the school leaders, most of the participants wanted training in Instructional supervision strengthening mentoring skills and management of colleague.
KEYWORDS: *Training Need Assessment, Professional Development Extension Program, Strategic Intervention Material*

INTRODUCTION

Enhancing the caliber of education is said to be the most effective way to combat poverty and achieve economic growth. However, teachers lack access to quality professional development opportunities, limited time for learning due to administrative tasks, and inadequate training can hinder their teaching practice (Abay, Jemil & Morallo,2019). Extension programs can help bridge this gap and foster meaningful relationships. With that, Republic Act 7722 mandates the Commission on Higher Education (CHED) to answer the urge for social needs to implement extension service programs (Bidad & Campiseño, 2010). In addition, Llenares et,al. (2018) elucidate that extension programs' ultimate aim is to disseminate information, support rural adult learning, and enhance technical and managerial skills (Danso et.al,2018). The demand for these services has surged significantly not just within Philippines HEIs but also on a global scale, as community extension embodies outreach, transformative impact, community empowerment, and collaborative endeavor. Furthermore, it fosters their engagement with partners spanning research, education, and pertinent institutions.

Colleges and Universities (SUCs) are required by the Commission on Higher Education (CHED) to address the demand for societal change. To achieve this, educational institutions have created and put into place a range of extension services and initiatives that aim to enhance and improve community life. The Agusan del Sur State College of Agriculture and Technology (ASSCAT) is committed to providing quality instruction, research, and extension services. This extension program and services demonstrate ASSCAT's goal to become a change agent and leader in the creation and dissemination of knowledge through this pillar. Extension plays a significant role in the knowledge creation process, as it helps to disseminate research findings and other relevant information in the community. It also helps to build capacity and empower people to take action and make positive changes in their lives. The extension aims to educate people in ways that improve their quality of life. Teaching them about new methods, tools, and techniques that enhance their well-being, health, and productivity is one way to do this.

To meticulously craft and establish pertinent extension initiatives that maintain significance, conducting an exhaustive evaluation of community needs in conjunction with an assessment of training requirements is crucial. This procedure involves active involvement

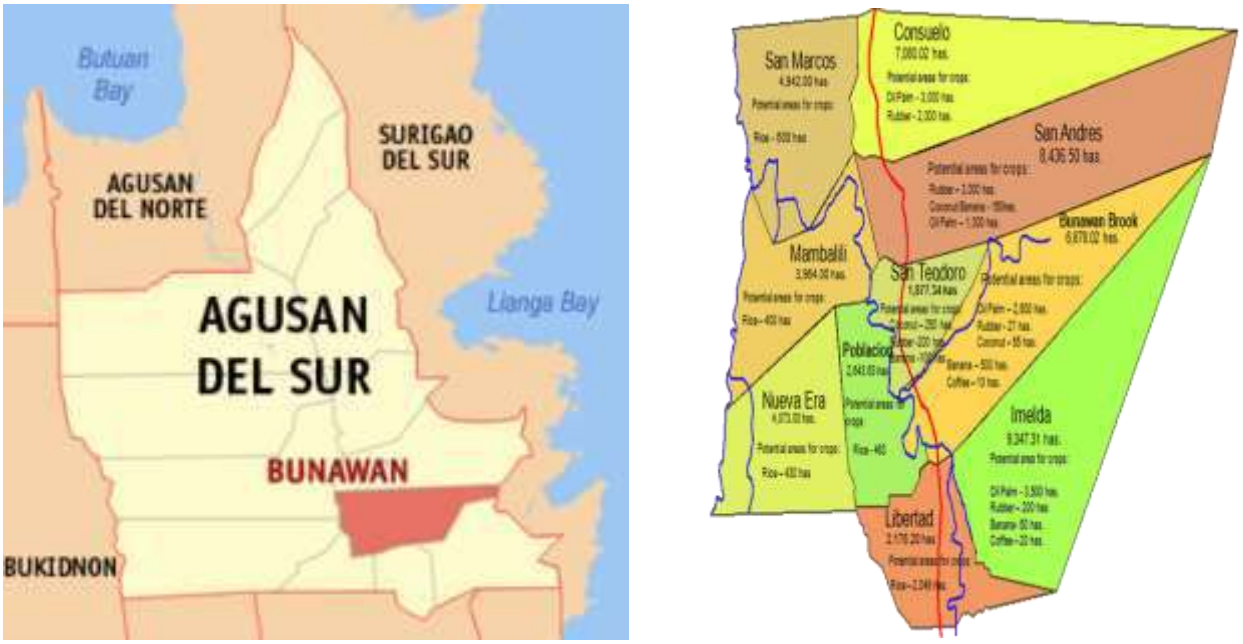
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with local stakeholders and the execution of focus groups, observations, surveys, and interviews aimed at pinpointing educational obstacles and priorities. By evaluating the current educational framework, resources, and methodologies, it becomes feasible to devise precise solutions that tackle the community's distinct needs, such as improving educational access and knowledge dissemination through technological means (Thomas, 2020). Furthermore, the training needs assessment process involves a methodical strategy to determine the presence of deficiencies in training. If such deficiencies are identified, it also involves defining the precise training measures necessary to address and overcome these deficiencies (Japan International Cooperation Agency, 2023). The procedures were carried out to develop an extension initiative that effectively caters to the requirements of the focal community.

This manuscript delineates the outcomes obtained from the interviews, focus group discussion, and survey carried out among principals and educators of secondary educational institutions in the Bunawan, Agusan del Sur locality. These findings will establish the foundation for the university's outreach initiative.

METHODS

This paper employed a descriptive research design. It aimed to describe the current community and training needs of High School teachers in Bunawan, Agusan del Sur. A face to face-to-face survey was conducted using a survey questionnaire developed by the extension service unit of ASSCAT and prescribed by ISO 9001:2015. A total of 18 high school teachers were selected as respondents through purposive sampling, as they are the target beneficiaries of the professional development extension program to be initiated. Descriptive statistics were utilized to analyze the gathered data.



Geographical Map

RESULT AND DISCUSSION

Profile of High School Teachers in Bunawan, Agusan Del Sur.

Table 1 illustrates the demographic characteristics of the participants hailing from various secondary educational institutions within the Municipality of Bunawan, Agusan del Sur. In terms of their age distribution, 8 out of 18 respondents, constituting 44.44%, fall within the age range of 21-30 years, while 4 out of 18 respondents, accounting for 22.22%, belong to the 31-40 years age bracket, and 6 out of 18 respondents, totaling 33.34%, are aged between 41-50 years. This data suggests that the majority of the participants are in the 21-30 years age group.

When it comes to the sex of the respondents, 3 of 18 or 16.67% are male, and 15 of 18 or 83.33% are female. From the data gathered most of the teacher respondents are female.

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The educational attainment of the participants indicates that 6 out of 18, equivalent to 33.33%, are considering furthering their studies, given that they have already completed their undergraduate degree. An encouraging observation is that the majority of the respondents hold a master's degree, with 9 out of 18, representing 50%, reporting that they have graduated with this qualification. Moreover, 3 out of 18 participants, accounting for 16.67%, have attained a doctoral degree.

In terms of the duration of their service, 4 out of 18 individuals, equivalent to 22.22%, were engaged for a period ranging between 1 to 3 years. Similarly, another 4 out of 18, also 22.22%, had a service tenure of 4 to 6 years. Additionally, 5 out of 18 respondents, accounting for 27.78%, reported being in service for 7 to 9 years. Lastly, an equal proportion of 5 out of 18 participants, or 27.78%, indicated having a service length of 9 years or more.

We have additionally considered the ranking of the participants in terms of their service. Out of the total of 18 respondents, 14, equivalent to 77.78%, were educators who could have held roles such as Teacher I, Teacher II, or Teacher III. Furthermore, 2 out of the 18 respondents, accounting for 11.11%, were identified as master teachers. Likewise, the same percentage of respondents, which is 2 out of 18 or 11.11%, were serving as School Heads.

In terms of the field of specialization of the respondents, 5 out of 18, equivalent to 27.78%, have a background in Mathematics, 3 out of 18, which is 16.67%, have majored in English, 7 out of 18, amounting to 38.89%, have specialized in Science, 2 out of 18, or 11.11%, have pursued BTLEd, and 1 respondent did not specify their major.

Of the three secondary schools surveyed, 5 out of 18 or 27.78% are from Libertad National High School, 8 of 18 or 44.44% are from West Bunawan National High School, and 5 out of 18 or 27.78% are from Bunawan National High School.

Table 1: Profile of High School Teachers in Bunawan, Agusan Del Sur.

Profile		Frequency	Percentage
AGE	21-30	8	44.44%
	31-40	4	22.22%
	41-50	6	33.34%
SEX	MALE	3	16.67%
	FEMALE	15	83.33%
Highest Educational Attainment	Undergraduate	6	33.33%
	Master's degree	9	50%
	Doctor's degree	3	16.67%
Length of service	1-3 years in service	4	22.22%
	4-6 years in service	4	22.22%
	7-9 years in service	5	27.78%
	9 years and above in service	5	27.78%
Rank	Teacher	14	77.78%
	Master teacher	2	11.11%
	School Head	2	11.11%
Field of Specialization	Math	5	27.78%
	English	3	16.67%
	Science	7	38.89%
	BTLEd	2	11.11%
	Others	1	5.56%
School	Libertad National High School	5	27.78%
	West Bunawan National High School	8	44.44%
	Bunawan National High School	5	27.78%

Ranking of the Training Needs of the Respondents

Table 2 presents the diverse training requirements identified by the participants. The table shows that the Preparation of Strategic Intervention Materials (SIM) to enhance students' performance ranks 1 in the training need. This indicated that the Training demand among High School Teachers was the Preparation of Strategic Intervention Materials (SIM). Preparing Strategic Intervention Materials

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(SIM) poses challenges like time and budget constraints, teacher competence, and material durability, as highlighted in the study on teachers' experiences(Cherry et.al.,2022). In addition, Cagape, Lloveras and . Bangoy (2023) support that preparing Strategic Intervention Materials (SIM) can be challenging due to the need for innovative approaches.

Table 2: Ranking of the Training Needs of the Respondents (Based on Survey Checklist)

Training Needs	Rank
Preparation of Strategic Intervention Materials (SIM) to enhance pupils' performance	1
Action Research Writing	2
Teaching strategies for teaching children with special needs	3
Capacitate teachers on teaching methods, approaches, strategies and techniques	4
Training on Statistical Tool for Research	5
Multimedia Development (Photo Editing , Video Editing)	6
Capacitate faculty on Performance-based Assessment Tasks	7
Preparation of Traditional and (ICT) Digitized Instructional Materials	8
Review, Enhance and Prepare an OBE lesson plan with PPST competencies	9
Computer Operations (Software , Hardware , Internet Technology)	10
Intellectual Property Protection	11
Community and school support strategies	12
Sample Lesson Plan Preparation	13
School leadership and management training	14
Harmonized Gender and Development Guidelines	15

Least Learned Competencies in Mathematics, English, and Science

Table 3 presents the least learned competencies in Mathematics, English, and Science. The table shows that in Mathematics, four (4) out of Nine (9) Mathematics teachers attest those operations on integers, basic, and fundamentals on integers are the least learned competencies in Mathematics. Competency in operations on integers, including basic operations and fundamental concepts, is crucial in mathematics education but often poses challenges for students at various educational levels. In addition, Function, Laws of exponent, Adding and subtracting polynomials, and Unit conversion in the metric system were found to be the other behind competencies. Study indicates that errors in solving integer operation problems stem from reading, comprehension, transformation, process skill, and conclusion-drawing errors, highlighting students' difficulties in mastering these concepts (Moh et.al.,2022).

In terms of English subjects, Six(6) out of eleven (11) english teachers connote that Reading Comprehension is the least learned competency in English. Reading comprehension is a crucial aspect of English language learning, with various factors influencing its development. Additionally, Mother tongue, Skills in constructing sentences, Literatures, Tenses of Verbs ,and Judging the validity of the text/stories listened to were found to be the other behind competencies. English language learners face challenges such as using the first language, culturally disparate schemata, and vocabulary knowledge deficits when improving their reading comprehension skills, highlighting the need for targeted training and support for teachers (Juan.et.al.,2023).

Lastly, in terms of Science subjects, Two (2) out of eight (8) science teachers stated that Projectile motion, impulse and momentum, and conservation of linear momentum are the least learned competencies in Science. The findings is accordance to the study of Dimaiwat (2022) show that projectile motion, impulse and momentum, and conservation of linear momentum are among the least learned competencies in Science. Studies have shown that students often struggle with understanding these concepts, leading to misconceptions and low mastery levels. In addition, differentiates heat and temperature at the molecular level, differentiates the Epicenter of an earthquake from its focus, explains how earthquake waves provide information about the interior of the earth, Types of bonds that carbon forms that result in the diversity of carbon compounds, How atoms combine with other atoms by transferring or by sharing electrons, and Motions, Speed, Distance, wavelength, Intensity were found to be the other behind competencies in Science. The need for intervention materials and appropriate teaching strategies to improve students' comprehension and scientific literacy in these areas is highlighted, emphasizing the importance of enhancing conceptual understanding and applying these fundamental principles in Science.

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Table 3: Least Learned Competencies

	Frequency
A. What specific competencies do your learners perform in very low	
1. Mathematics	
a. Operations on integer, basic and fundamentals on integers	4
b. Functions	1
c. Laws of exponent	1
d. Calculates the measure of the central tendency of ungrouped and grouped data	1
e. Adding and subtracting polynomials	1
f. Unit conversion in metric system	1
2**. English**	
a. Reading Comprehension	6
b. Mother tongue	1
c. Skills in constructing sentences	1
d. Literatures	1
e. Tenses of Verbs	1
f. Judging the validity of the text/stories listened to	1
3. **Science**	
a. Differentiate Heat and temperature at the molecular level	1
b. Differentiate the Epicenter of an earthquake from its focus	1
c. Explain how earthquake waves provide information about the interior of the earth.	1
d. Types of bonds that carbon forms that result in the diversity of carbon compounds	1
e. How atoms combine with other atoms by transferring or by sharing electrons	1
f. Projectile motion, impulse and momentum, and conservation of linear momentum	2
g. Motions, Speed, Distance, wavelength, Intensity	1

Support need from parents and stakeholders

Table 4 displays the different training needs of parents and stakeholders as identified by the participants. For the parents and stakeholders to support quality education, it was revealed that they mostly need training related to financial management and literacy as well as in empowering basic literacy to aid learners in the take-home activities. According to Sabirin et.al., (2023), financial literacy and management training for school parents is crucial for instilling money management skills in students. In addition, empowering parents with basic literacy skills can significantly aid learners in take-home activities, fostering a conducive learning environment. Research emphasizes the importance of parental involvement in enhancing children's education], especially during the COVID-19 pandemic when home learning became prevalent (Papathanasiou, 2022, Wiyoko et.al., 2022)

Moreover, a noteworthy portion of the participants suggests that parents and stakeholders also need to have trainings in areas related to proper discipline practices to their children, practical and relevant livelihood skills and techniques, and empowerment of parents and responsible parenthood. Conversely, a minor proportion suggests trainings and orientation on active participation during school conferences and activities, parental support/guidance specifically on the issue of early pregnancy, awareness on the parent's responsibilities towards the behavior of their own children as learners, and even orientation on educational system. The participants believe that empowering the parents and stakeholders and strengthening their support plays a crucial role in minimizing challenges faced by students and schools. This supports the study of Petzold (2018) which claimed that parental involvement is key to student success, with studies highlighting the positive impact of meaningful parent participation on academic and social-emotional growth. By recognizing the essence of parental involvement and advocating for meaningful partnerships, stakeholders can work together to address issues like dishonesty, truancy, and disobedience among learners, ultimately creating a more efficient and just society (Xaba, 2015).

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Table 4. Support Need from Parents and Stakeholder

B. What support do you need from parents and stakeholders?	Frequency
a) Proper discipline practices for their children	5
b) Empowering basic literacy to aid their learners in the take-home activities	6
c) Awareness on the parent's responsibilities towards the behavior of their own children as learners	1
d) Active participation during school conferences and activities	3
e) Physical facilities such as instructional materials and books	1
f) Parental guidance and awareness specifically on the issue of early pregnancy	1
g) Financial Management/literacy	7
h) Practical and relevant livelihood skills and techniques	4
i) Orientation on educational system	1
j) Empowerment of parents and responsible parenthood	5
k) Training about parental support/guidance	2

Training Needs of the School Heads

Table 5 presents the various training needs of the school leaders among the secondary schools in Bunawan, Agusan del Sur. Base on the result, most of the participants wanted trainings in Instructional supervision and strengthening mentoring skills and management of colleague. It is also revealed that trainings on new trends on classroom observation and in education, teaching strategies, MATATAG Curriculum, proper distribution of work assignments, and professional and fair leadership are suggested by the participants. These findings correlate with the study of Mampane (2017) which emphasizes the importance of equipping school heads with updated abilities and knowledge for effective teacher leadership, as well as the significance of mentoring support in implementing innovative projects and overcoming obstacles in education management (Koverova, 2022). Additionally, research underscores the significance of fair task distribution by leaders in reducing follower emotional exhaustion, with transformational leadership positively influencing positive school environment (Scheel et.al., 2019). Furthermore, high school leaders engaging in training programs focused on curriculum improvement, such as the MATATAG Curriculum, can benefit from targeted professional development to enhance their knowledge and skills in leading whole school changes

Table 5: Training Needs of the School Heads

C. As leader/ manager of the school, what training do you need?	
a. Instructional supervision	4
b. Strengthening Mentoring skills and management of colleague	4
c. General Professional Growth and Development	1
d. New trends on classroom observations and in education as a whole	3
e. Teaching Strategies	2
f. GAD related training	1
g. Child Protection Policies	1
h. Rights and privileges of the teachers	1
i. Training on New Normal Teaching Strategies	1
j. Enhancement on their intrapersonal skills	1
k. Training and orientation on MATATAG Curriculum	2
l. Content and Pedagogy	1
m. Integration of the 21st Century learner	1
n. Proper distribution of Work assignments	2
o. Professional and fair leadership	2
p. Conflict resolution and time management	1

CONCLUSION

Based on the findings of this study, some key conclusions were drawn. The majority of respondents were female, aged 21-30, with 7-9 years of service. Teachers of Mathematics, English, and Science requested capacity building in development of Strategic Intervention Materials (SIM) to improve student academic performance in the Least Learned Competencies (LLC). Specifically, operations on integers in Mathematics, reading comprehension in English, and concepts such as projectile motion, impulse and momentum, and conservation of linear momentum in Science were identified as areas needing improvement. Additionally, parents and stakeholders articulated a need for training in financial management and literacy, and basic literacy to better support take-home activities. Finally,

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school leaders emphasized the need for training in instructional supervision, and mentoring skills, leadership and management skills. Addressing these needs is essential for improving educational outcomes and fostering a supportive and effective learning environment.

Recommendation

Based on the results of this study, the following recommendations were drawn:

1. Initiate partnership with the secondary schools located in Bunawan, Agusan del Sur to provide an extension program for sustainable quality education.
2. Provide training on preparing Strategic Intervention Materials (SIM) for Math, English, and Science teachers that may focus on operations on integers, reading comprehension, projectile motion, impulse and momentum, and conservation of linear momentum for Science teachers
3. Offer training programs on financial management and literacy to empower parents and stakeholders in supporting students' learning.
4. Organize workshops on basic literacy skills to equip parents and stakeholders in assisting with take-home activities.
5. Provide training on instructional supervision techniques to enhance school leaders' ability to guide and support teachers.
6. Conduct workshops on strengthening mentoring skills to improve school leaders' capacity to develop and coach teachers.
7. Organize training sessions on managing colleagues to equip school leaders with effective strategies for fostering a collaborative and productive school environment.

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COMPARATIVE STUDY ON MORAL VALUES AND LOCUS OF CONTROL BETWEEN ATHEISTS AND THEISTS

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ABSTRACT

The degree to which individuals feel they have control over the events and circumstances that impact their lives is known as their locus of control, a psychological concept. Guidelines that help a person distinguish between good and wrong are known as moral values. The study aims to compare the relationship between Locus of Control and Moral Identity among Atheists and Theists, determining the influence of religious belief on these factors. Atheism believes in the absence of deities, using scientific data and logical justifications to explain human life. Theism is the belief in a superior reality, often called God in Judaism, Christianity, and Islam. Understanding religious beliefs can help us understand human nature and religion's impact on values and behaviors. A sample of 211 individuals was included, including male and female participants from various geographical areas. The study used socio-demographic data collection tools, such as the Moral Identity Questionnaire and Rotter's Locus of Control Scale, and collected data for statistical analysis. The study maintains confidentiality and uses T-tests to examine significant relationships and gender differences. The research found that no significant difference exists between theists and atheists on their locus of control and moral values, and higher morality levels lower an individual's locus of control.

KEYWORDS: *Locus of control, Atheism, Theism, Moral values, Religio*

INTRODUCTION

Human behaviour is fundamentally shaped by moral principles, which influence how we view and engage with the world. Moral principles are crucial in research because they help ensure that investigations are carried out ethically and responsibly. The degree to which having moral qualities is a social identity relevant to one's self-concept is what moral identity means. It refers to the degree to which people identify as moral beings and are inspired to behave in accordance with their moral ideas and ideals. Every person experiences both positive and negative effects during their existence. While they appreciate their success in life and work to increase the likelihood of positive outcomes, they also work to reduce the possibility of negative consequences. Locus of control describes a person's perspective on their level of control throughout their lives. The Locus of control is fundamentally a view of how much control individuals have over their lives and the results of their activities. People with an internal Locus of control typically believe they are in charge of their own life. In contrast, those who have an external Locus of control typically think other forces or uncontrollable situations govern how their activities turn out. The concept of Locus of control is essential to understand in practically every area of psychology. This is mostly because it may be used in various daily situations. Baron d'Holbach stated in 1772 that "all children are born atheists; they have no idea of God," and George H. Smith noted in a similar vein: "The individual who is not acquainted with theism is an atheist because he does not believe in a god." A lack of belief in the existence of deities is referred to as atheism in its broadest sense. It is a philosophical and theological position that rejects the notion that there are any deities. Atheists use scientific data and logical justifications to explain the nature of the cosmos and human life. Theism is the belief that there is one superior or ultimate reality, which one may also refer to personally, upon which all restricted or finite things are dependent in some manner. There are many different theistic beliefs, ranging from believing in just one God to believing in many gods or goddesses. Christianity, Islam, Judaism, Hinduism, and many other theistic religions are among these. Theists may regularly worship, pray, and admire sacred writings like the Bible or the Quran.

OBJECTIVES

- To determine the influence of religious belief on Locus of control and Moral identity.
- To understand the relationship between locus of control and moral identity among theists and atheists.
- To find gender differences in locus of control and moral identity among atheists and theists.

METHODOLOGY

The population sample for this study was decided using the convenience sampling method, and primary data for the research was collected using Rotter's Locus of control scale and the Moral Identity Questionnaire by Black and Reynolds. Moral Identity Questionnaire is a Likert scale with five points, From 1 (strongly disagree) to 5 (strongly agree). The moral self and moral integrity

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are measured using two separate subscales of the MIQ. The current study's population is Atheists and Theists of all genders in urban, Suburban, and rural areas. The total sample of 211 individuals consisted of diverse demographic areas and age categories. The individuals who consider themselves agnostic are not included in this study. T-test, SPSS 2.0, and Pearson's correlation are used to analyze the relationship between variables and gender differences in the research.

RESULTS

- There is no significant difference in Locus of control and Moral values between Males and Female. This shows that gender does not play a crucial role in influencing an individual's locus of control and moral values.
- There is no significant difference in Locus of control and Moral values between Atheists and Theists. This denotes that an individual's religious belief does not impact their locus of control and moral values.
- The higher the level of Morality, the lower the level of locus of control of an individual. We can understand that those who have strong moral standards may feel less in control of their life events, possibly attributes outcomes of their life to external factors.

SUGGESTIONS

- The study can be conducted using qualitative methods to gain an understanding of this topic.
- Further research is advised to require larger and more diverse cross-cultural samples.
- Gaining a better understanding of the influence of Religious stand in the Locus of control and Morality could also aid in more successfully targeting future intervention methods for Atheists and Theists.

CONCLUSIONS

We could see an interplay between locus of control, moral values, gender, and religious beliefs in this study. This study highlights the diverse aspects of human psychology by demonstrating the lack of significant differences in these factors across belief systems. The relationship between morality and locus of control indicates a valuable perspective for research and future applications in counseling and psychology. The study emphasizes how complex human psychology is and the need for a diverse approach to understanding the aspects that influence morality and locus of control.

FIGURES AND TABLES

Table 1 shows the relationship between gender and variables

Variables	Gender	N	Mean	Std. Deviation	Levene's test for equality of variances	
					F	Sig.
Morality	Male	127	73.74	11.522	.015	.904
	Female	82	71.56	11.589		
Locus of Control	Male	127	10.06	3.034	.537	.464
	Female	82	10.96	2.861		

Table 2 shows the relationship between religious stand and variables

Variables	Religious Stand	N	Mean	Std. Deviation	Levene's test for equality of variances	
					F	Sig
Morality	Atheism	109	77.27	10.223	2.935	.088
	Theism	100	68.11	11.093		
Locus of Control	Atheism	109	9.50	2.990	1.955	.164
	Theism	100	11.41	2.675		

Table 3 shows the Mean and Standard deviation of the variables.

Variables	Mean	Std. Deviation	N
Morality	72.89	11.569	209
Locus of Control	10.42	2.993	209

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Table 4 shows the correlation between the variables, Morality and Locus of control

Variables		Morality	Locus of Control
Morality	Pearson Correlation	1	-.300**
	Sig. (2-tailed)		.000
	N	209	209
Locus of Control	Pearson Correlation	-.300**	1
	Sig. (2-tailed)	.000	
	N	209	209

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REVIEW ON NABUMETONE DERIVATIVES SYNTHESIS IN THE LAST 10 YEARS

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ABSTRACT

The focus today is on the synthesis of derivatives from the approved drugs, so decrease the chance of synthesizing a potentially toxic compound. One of the commonly used drugs is the non-steroidal anti-inflammatory drugs for the treatment of painful arthritis. Nabumetone is a non-steroidal anti-inflammatory drug. In recent years many of derivatives having different biological activities have been synthesized from nabumetone. The purpose of this review is giving sight to these derivatives in the last 10 years and the biological activities of them.

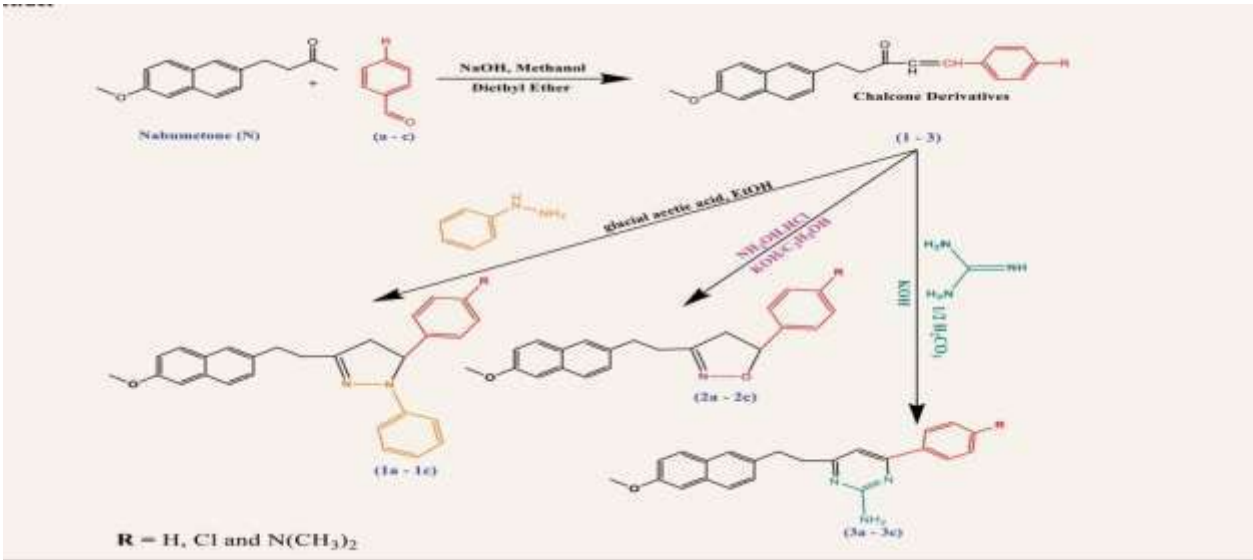
KEY WORDS: *nabumetone , non-steroidal anti-inflammatory, anti-inflammatory , anti-cancer, anti-bacterial.*

introduction

As a non-steroidal prodrug that reduces inflammation, nabumetone works pharmacologically through the metabolite 6-methoxy-2-naphthylacetic acid (6-MNA). The non-acidic drug nabumetone itself is extensively metabolized in the first pass after absorption to produce the primary circulating active metabolite (6-MNA), which is a far more effective inhibitor of cyclooxygenase (COX)-2.[1,2]The primary purpose of nabumetone treatment is to relieve arthritic pain.[3] The enhanced gastrointestinal (GI) tolerability of this medication is believed to be attributed to its non-acidic nature, prodrug formulation, and absence of biliary secretion of its active metabolite, 6-methoxy-2-naphthylacetic acid. [4] Nabumetone is one of a class of medications known as non-steroidal anti-inflammatory drugs (NSAIDs), which are used extensively to treat both acute (like fever and discomfort) and chronic (like rheumatoid arthritis) inflammatory diseases. [5] NSAIDs have also been shown to provide protection against a variety of serious illnesses, such as cancer and heart attacks. [6] By blocking the cyclooxygenase enzyme(COX1,2), non-steroidal anti-inflammatory drugs prevent prostaglandins from being biosynthesised, which has a significant inflammatory function in inflammation.[7,8]

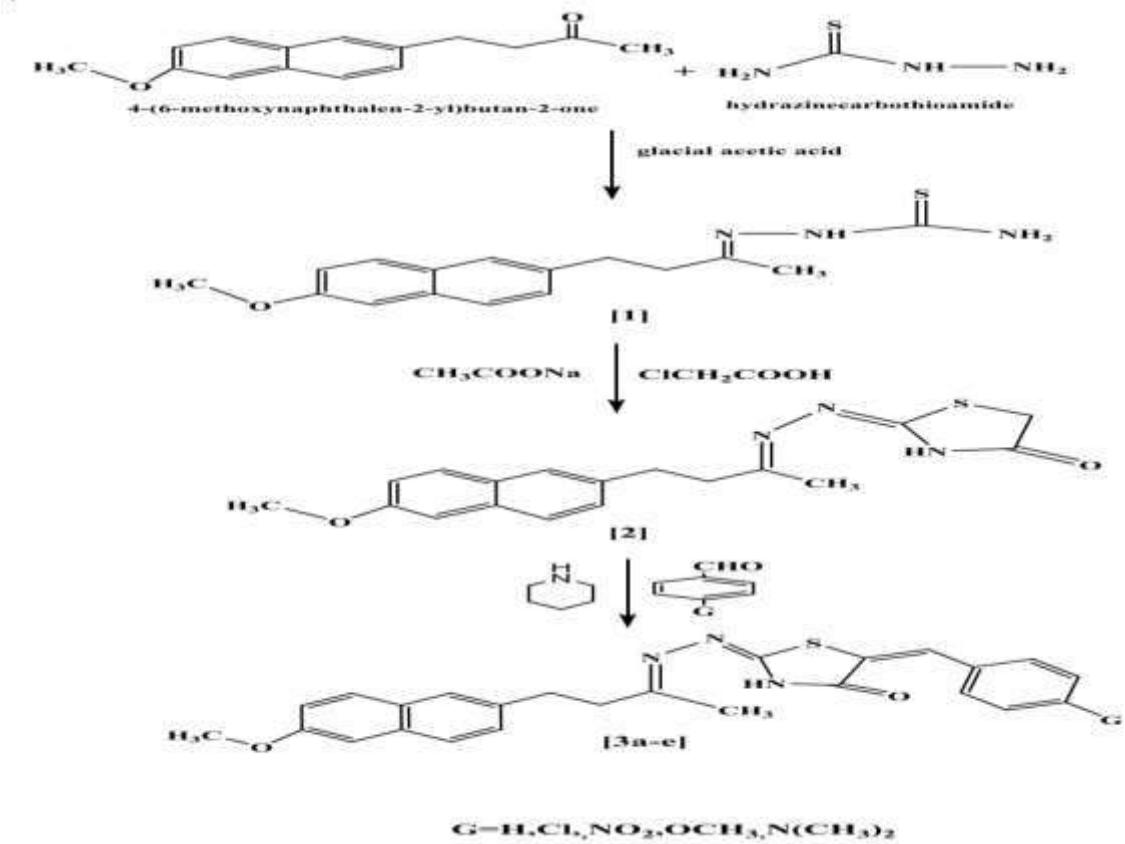
Although they are often used, non-steroidal anti-inflammatory medicines (NSAIDs) have the potential to cause small bowel enteropathy, peptic ulcer disease, and foregut symptoms. Perforations and bleeding into the gastrointestinal tract may exacerbate such an iatrogenic damage. Reducing the amount of NSAIDs taken or using them together with proton pump inhibitors (PPIs) lowers the incidence of problems, dyspepsia, and peptic ulcer disease.[9] Nitrogen-containing 5-membered heterocyclic compounds, or pyrazolines, are widely recognized and significant chemicals. Several synthetic routes have been developed for them. The discovery that many pyrazoline derivatives have significant biological activities has sparked interest in this area of study. Their antibacterial, antimycobacterial, antifungal, anti-amoebic, anti-inflammatory, analgesic, antidepressant, and anticancer properties are only a few of their notable effects. [10,11] Nitrogen and oxygen are found in the five-membered heterocyclic compounds known as isoxazoles and isoxazolines. As an antibacterial, antifungal, anti-inflammatory, anti-tubercular, anti-cancer, and anti-neoplastic drug, isoxazoline has demonstrated remarkable efficacy in clinical trials. [12,13] Pyrimidine is a nitrogen-containing, six-membered heterocyclic molecule that occurs naturally in vitamin B1 and nucleic acid components (uracil, thymine, and cytosine). Pyrimidines and their derivatives are useful for pharmaceuticals and agricultural chemicals. Numerous pyrimidine derivatives have been shown to have anti-inflammatory, antitumor, antiviral, anticancer, and antibacterial properties. [14,15] There is an article published in 2019 stated that a number of derivatives had been synthesized containing pyrazoline , isoxazoline and pyrimidine rings and using nabumetone as starting material. This paper showed that increase in the anti-inflammatory effect of nabumetone by adding these rings. [16]

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Scheme 1: (synthesis of some new pyrazoline, isoxazoline and pyrimidine derivatives bearing nabumetone moiety) [16]

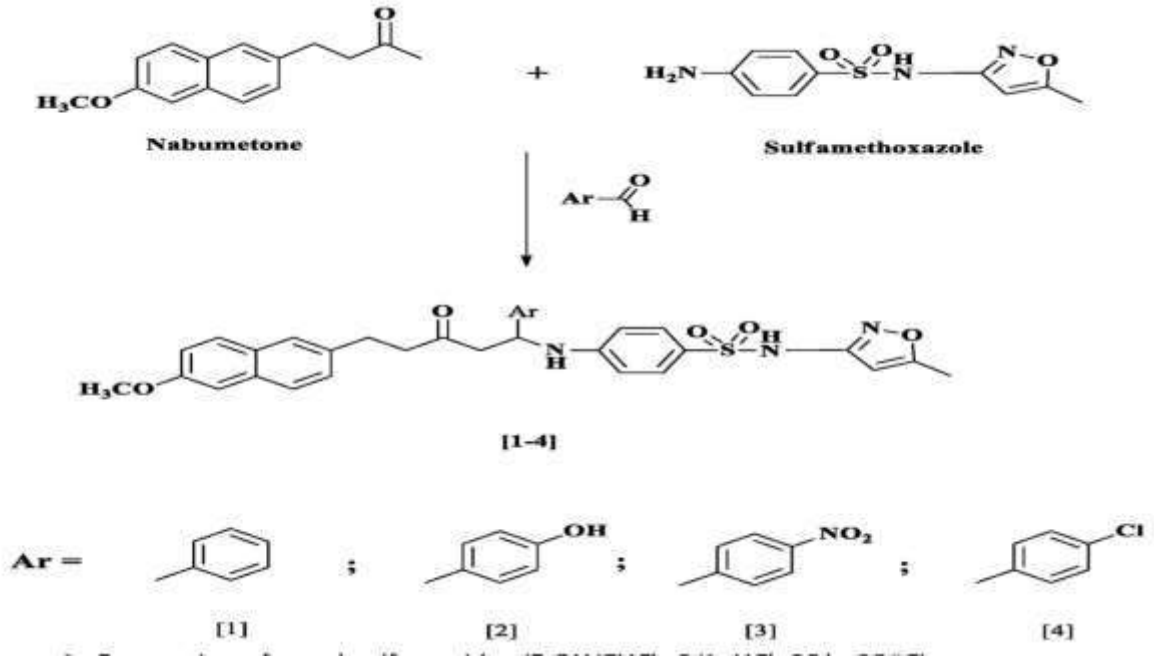
Another heterocyclic compound with biological significance is thiazolidinone, which has a carbonyl group at positions 2, 4, or 5, a nitrogen atom at position 3, and a sulfur atom at position 1. The 4-thiazolidinone moiety, also referred to as the "wonder nucleus," is a magical component with a broad range of biological actions, including antiviral, antibacterial, anti-inflammatory, and anti-tubercular properties. [17,18] There is another article published in 2019 showed that a number of derivatives had been synthesized containing this group by using nabumetone as starting material. This paper described that these derivatives had some anti-bacterial and anti-fungal properties. [19]



Scheme 2: (Synthesis of some New 4-Thiazolidinones Derivatives from nabumetone.) [19]

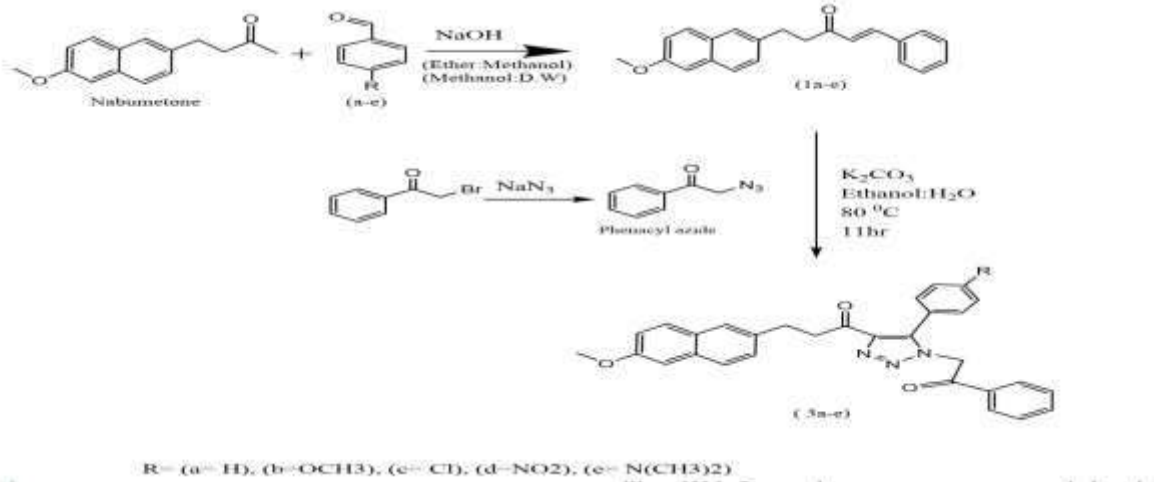
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One of the most well-known antimicrobial medications is sulfonamide. The amino group at the para position of the benzene ring and the sulfonamide group make up the basic structure of sulfonamides. A growing number of bioactive compounds with the sulfonamide subunit have been developed due to their significant biological effects, including anti-tumor, antioxidant, anti-bacterial, and anti-fungal characteristics. [20,21] A research paper published in 2020 talked about the synthesis of derivatives containing sulfonamide and nabumetone. These derivatives had good anti-bacterial activity comparing to sulfamethoxazole. [22]



Scheme3: (synthesis of some sulfonamides derivatives from nabumetone.)[22]

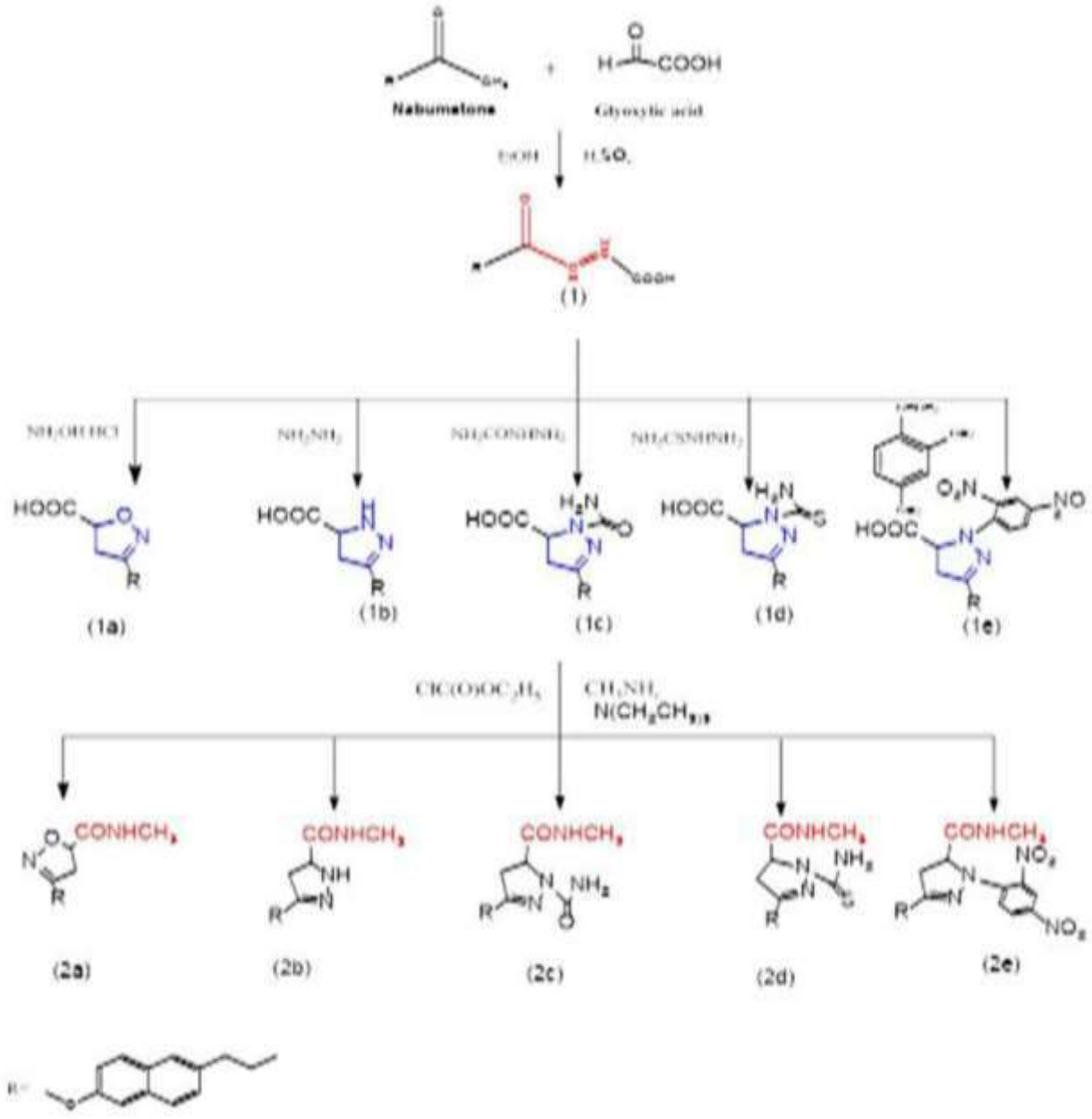
Triazole compounds, which include three nitrogen atoms and two carbon atoms, exhibit a wide range of biological activity because they can bind to different enzymes and receptors in the biological system. Several therapeutic classes, including antibacterial, antifungal, anticancer, antioxidant, antiviral, anti-inflammatory, analgesic, antiepileptic, antihypertensive, antidepressant, anti-diabetic, anti-anxiety, and anti-tubercular, contain the triazole nucleus as a key structural component. [23,24] A paper published in 2021 showed the enhancement in the anti-inflammatory effect of nabumetone by using it in the synthesis of number of derivatives containing triazole ring. [25]



Scheme 4: (Synthesis of some new triazole derivatives bearing nabumetone moiety.) [25]

Also in 2021 a research paper showed that a number of derivatives had been synthesized from nabumetone , these derivatives bearing different five membered heterocyclic ring systems and some of these derivatives have a good anti-proliferative activity . [26]

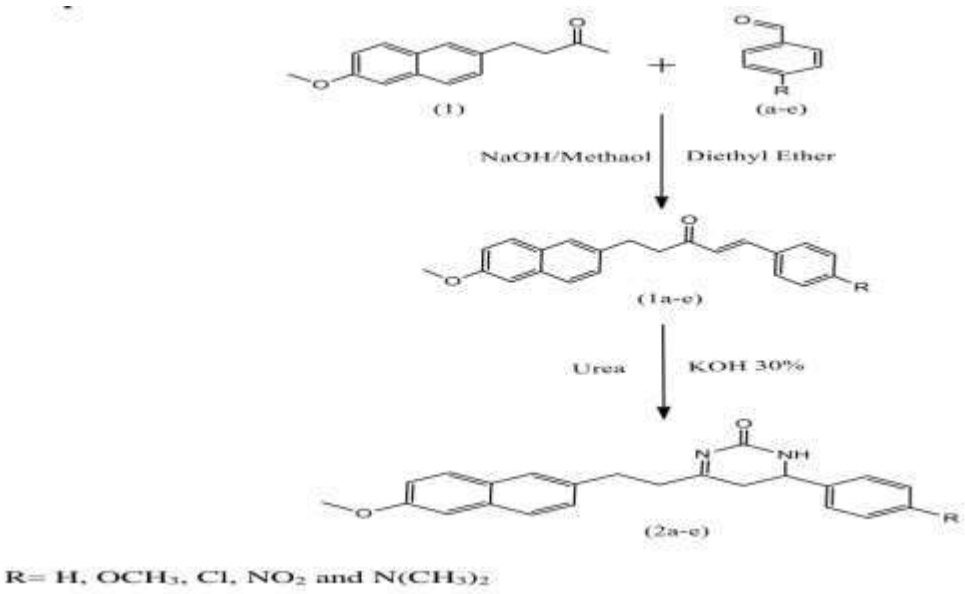
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Scheme 5: (synthesis of some new five-member ring heterocyclic compounds from nabumetone.) [26]

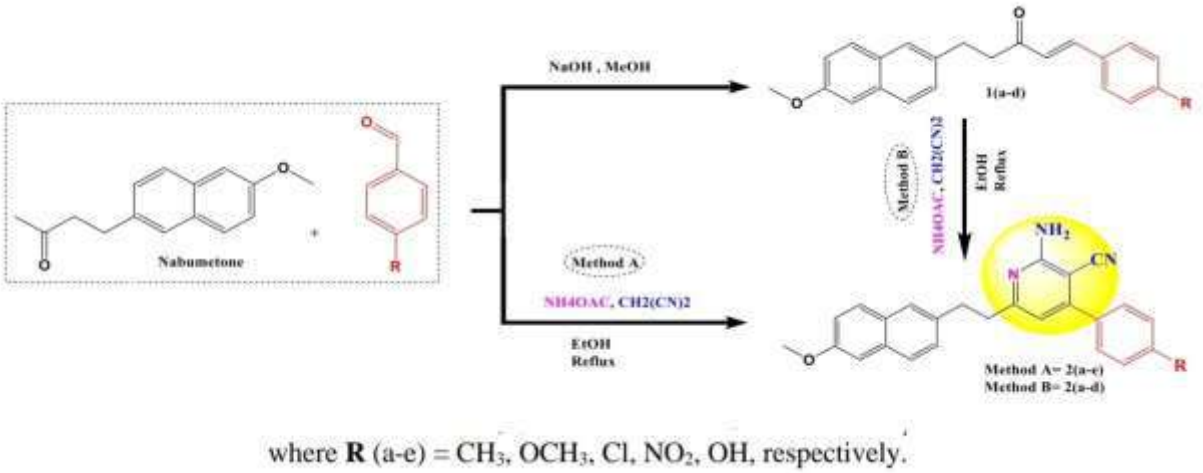
In 2023 a research showed that enhancement in the anti-inflammatory activity of nabumetone occurred when using it in the synthesis of some derivatives containing pyrimidine ring. [27]

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Scheme 6: (synthesis of some pyrimidine derivatives from nabumetone)

An isostere of benzene called pyridine (C5H5N) is utilized as a precursor in the synthesis of target agrochemicals and medicines. Antimicrobial, antiviral, anticancer, anti-diabetic, antifungal, anti-inflammatory, and anti-mycobacterial properties. [28,29] An article published in 2023 stated the synthesis of a number of derivatives (containing pyridine moiety) from nabumetone and some these derivatives showed good anti-cancer activity against lung cancer cells. [30]



Scheme 7: (Synthesis of new pyridine derivatives of nabumetone.) [30]

Conclusion

Nabumetone drug is non-steroidal anti-inflammatory drug but can be used to synthesize derivatives that either have enhanced anti-inflammatory activity or different type of activity like anti-bacterial, anti-fungal, anti-proliferative and anti-cancer. Also it may be investigated to design derivatives have different types of activities other than listed above.

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EXPLORING THE COMPLICATIONS OF TYPE 2 DIABETES MELLITUS: PATHOPHYSIOLOGY AND MANAGEMENT STRATEGIES

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ABSTRACT

Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disorder marked by insulin resistance and progressive beta cell dysfunction, leading to persistent hyperglycemia. The disease is associated with numerous complications, including cardiovascular disease, nephropathy, neuropathy, and retinopathy, which significantly impact patient morbidity and mortality. This paper explores the pathophysiological mechanisms underlying these complications, highlighting the roles of chronic hyperglycemia, inflammation, and oxidative stress. Furthermore, it examines the risk factors contributing to the development and progression of T2DM complications, such as genetic predisposition, obesity, physical inactivity, and poor glycemic control.

Effective management strategies are discussed, encompassing both pharmacological and lifestyle interventions. Pharmacological approaches include the use of metformin, SGLT2 inhibitors, GLP-1 receptor agonists, and agents targeting cardiovascular and renal protection. Lifestyle modifications emphasize the importance of dietary changes, regular physical activity, and smoking cessation. Additionally, the paper reviews technological advancements in continuous glucose monitoring and telemedicine, which enhance patient management and care.

Future directions in T2DM management are considered, focusing on emerging therapies targeting novel molecular pathways and the integration of artificial intelligence in personalized medicine. This comprehensive review underscores the necessity of a multifaceted approach in managing T2DM and its complications, aiming to improve patient outcomes and quality of life.

KEYWORDS : *Type 2 Diabetes Mellitus, T2DM complications, Insulin resistance, Beta-cell dysfunction, Diabetes patient education*

INTRODUCTION

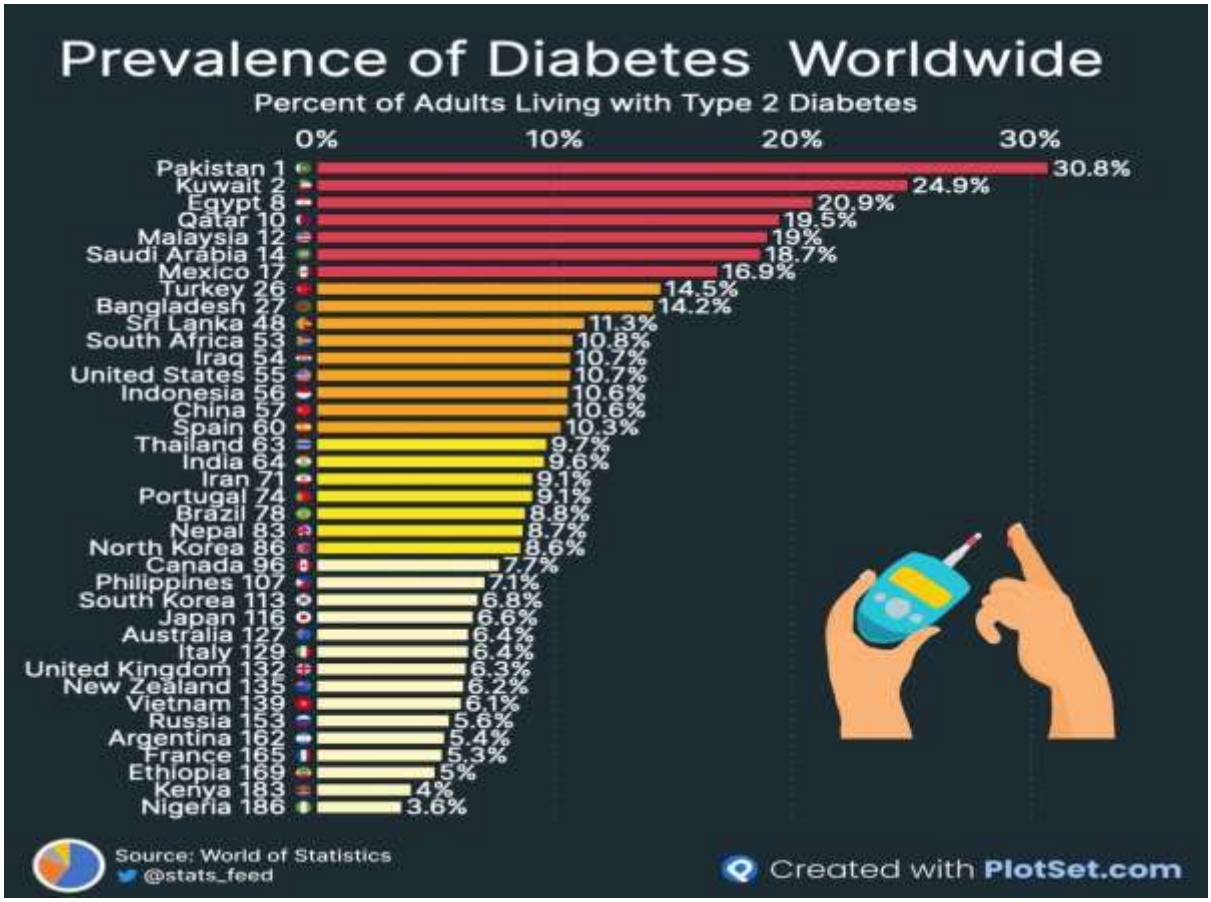
Diabetes belongs to one of the largest global health crises of this century. India has the second-largest number of diabetics worldwide. According to an estimate, over 74 million Indians were diagnosed with diabetes in 2021.Type 2 Diabetes Mellitus (T2DM) is a prevalent chronic metabolic disorder that poses significant health challenges globally. The number of adults living with diabetes has reached alarming levels, with T2DM accounting for approximately 90% of these cases. This condition is characterized by insulin resistance and progressive beta cell dysfunction, leading to chronic hyperglycemia and various long-term complications. The pathophysiology of T2DM involves complex interactions between genetic, environmental, and lifestyle factors. Insulin resistance, a hallmark of T2DM, occurs when cells in the muscle, fat, and liver become less responsive to insulin, necessitating higher levels to achieve glucose uptake. Over time, pancreatic beta cells fail to secrete enough insulin to compensate for this resistance, resulting in elevated blood glucose levels. Additionally, chronic hyperglycemia leads to metabolic and vascular changes that contribute to the development of diabetic complications, such as cardiovascular disease, nephropathy, neuropathy, and retinopathy.

Cardiovascular disease (CVD) is a leading cause of morbidity and mortality among individuals with T2DM. Hyperglycemia and insulin resistance contribute to endothelial dysfunction, inflammation, and atherogenesis, increasing the risk of coronary artery disease, stroke, and peripheral arterial disease. Diabetic nephropathy, another common complication, involves damage to the kidneys' filtering units, leading to proteinuria and chronic kidney disease (CKD). This condition significantly increases the risk of end-stage renal disease (ESRD), requiring dialysis or transplantation.

Diabetic neuropathy affects the peripheral and autonomic nervous systems, causing symptoms ranging from pain and numbness in the extremities to gastrointestinal and cardiovascular dysfunction. The underlying mechanisms include oxidative stress, advanced glycation end-products (AGEs), and microvascular damage. Similarly, diabetic retinopathy, a leading cause of blindness, results from damage to the retinal blood vessels, leading to hemorrhages, microaneurysms, and neovascularization.

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Although the diabetes situation in India is comparatively less severe than in some other nations, 9.6% of adults in India are living with diabetes. However, due to its large population, India surpasses most nations in the number of diabetes patients. It is crucial to manage this condition effectively to prevent a further increase in its prevalence.



Source: World of Statistics

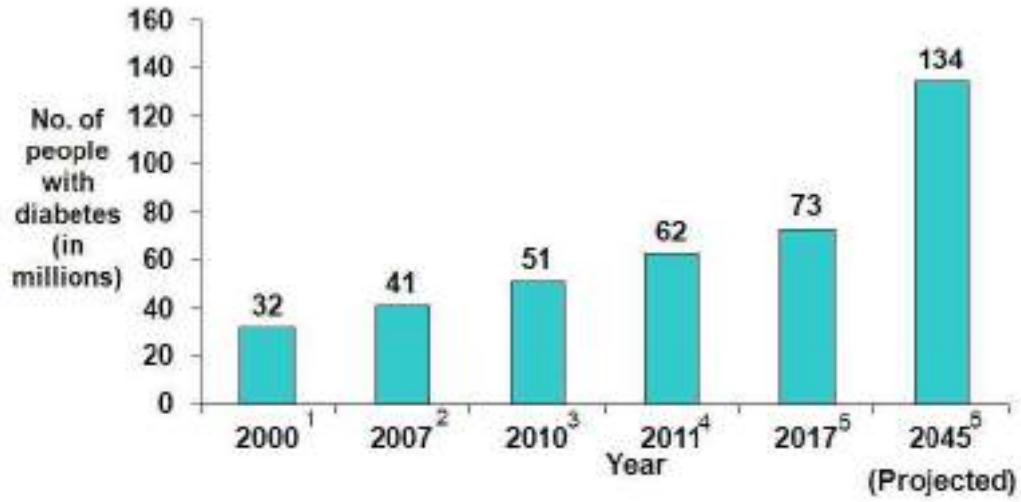
Effective management of T2DM and its complications requires a multifaceted approach. Pharmacological interventions, such as metformin, SGLT2 inhibitors, and GLP-1 receptor agonists, are commonly used to improve glycemic control and reduce the risk of complications. Additionally, lifestyle modifications, including dietary changes, regular physical activity, and smoking cessation, play a crucial role in managing T2DM. Advances in technology, such as continuous glucose monitoring (CGM) and telemedicine, have also enhanced the ability to monitor and manage blood glucose levels effectively.

Despite these advances, challenges remain in managing T2DM and its complications. Achieving and maintaining optimal glycemic control can be difficult, particularly for individuals with multiple comorbidities. Furthermore, disparities in healthcare access and quality can affect the management outcomes for different populations. Future research and development of new therapeutic approaches, including personalized medicine and artificial intelligence, hold promise for improving the management of T2DM and mitigating its complications.

In summary, T2DM is a complex and multifaceted disease with significant implications for individual and public health. Understanding the pathophysiology and risk factors underlying its complications is crucial for developing effective management strategies. This paper aims to explore these aspects in detail, providing insights into the current and emerging approaches for managing T2DM and its associated complications.

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Diabetes growth in India



Source : ISTI Portal

The chart illustrates the significant increase in the number of people with diabetes in India from 2000 to 2017, with a projection for 2045. In 2000, the number of people with diabetes was recorded at 32 million. Over the next seven years, this figure rose to 41 million by 2007, marking an increase of 9 million. By 2010, the number further escalated to 51 million, indicating a substantial rise of 10 million in just three years. This upward trend continued, with the number reaching 62 million in 2011, an increase of 11 million within a year. By 2017, the count stood at 73 million, demonstrating a consistent rise of 11 million over six years.

The projection for 2045 shows a dramatic surge, with the number expected to reach 134 million. This nearly doubles the 2017 figure, highlighting an alarming growth rate in the prevalence of diabetes. This trend suggests an urgent need for public health interventions to manage and prevent diabetes. Factors contributing to this increase include lifestyle changes, urbanization, dietary habits, and genetic predisposition. Effective measures such as promoting healthier lifestyles, improving healthcare access, and implementing preventive policies are crucial to address this growing public health challenge.

REVIEW OF LITERATURE

The following review of literature provides a comprehensive overview of the current understanding of T2DM pathophysiology, complications, and management strategies, drawing on recent studies and reviews.

Microvascular and Macrovascular Complications: Khalifa University of Science and Technology (2023) conducted an exome-wide association study to understand T2DM complications among Emirati individuals. The research identified genes linked to diabetic retinopathy, neuropathy, nephropathy, and cardiovascular complications, emphasizing the ellgenetic susceptibility to these conditions and the need for targeted diagnostic and treatment strategies.[1]

Pathophysiology and Treatment: This review discusses the pathophysiology of T2DM, highlighting insulin resistance and beta-cell dysfunction as core mechanisms. It examines various treatment options, including lifestyle modifications and pharmacological interventions such as Metformin and newer classes of medications like SGLT2 inhibitors and GLP-1 receptor agonists, underscoring the importance of early diagnosis and individualized treatment plans.[2]

Lifestyle Interventions in Diabetes Management: The study focuses on the role of lifestyle interventions, particularly diet and physical activity, in managing T2DM. It finds that a balanced diet, regular exercise, and weight management significantly improve insulin sensitivity and glycemic control, highlighting lifestyle changes as critical components of diabetes management alongside medication.[3]

Pharmacological Management: This article reviews various pharmacological treatments for T2DM, focusing on Metformin, insulin, and newer agents like SGLT2 inhibitors and GLP-1 receptor agonists. The study provides insights into how these medications work, their effectiveness, and their role in comprehensive diabetes management, emphasizing the need for personalized treatment plans.[4]

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Genetic and Environmental Factors: The research explores the interplay between genetic predisposition and environmental factors in the development and progression of T2DM. It highlights how genetic susceptibility interacts with lifestyle factors such as diet, physical activity, and body weight to influence diabetes risk and complications.[5]

Diabetes and Cardiovascular Risk: This review examines the relationship between T2DM and cardiovascular diseases, discussing the mechanisms through which diabetes increases the risk of cardiovascular complications. It evaluates various strategies to mitigate this risk, underscoring the importance of comprehensive cardiovascular risk management in patients with T2DM.[6]

RESEARCH OBJECTIVES

- To know about Diabetes Mellitus risk factors
- To discuss the Pathophysiology of complications
- To know about management strategy

Pathophysiology of Complications

Cardiovascular disease (CVD) is a leading cause of morbidity and mortality in patients with Type 2 Diabetes Mellitus (T2DM). The pathophysiology of CVD in T2DM is multifaceted, involving several interrelated mechanisms. Chronic hyperglycemia is a primary factor, leading to the formation of advanced glycation end-products (AGEs), which induce oxidative stress and inflammatory responses. This results in endothelial dysfunction, characterized by impaired nitric oxide production and increased vascular permeability. Insulin resistance and hyperinsulinemia further exacerbate these issues by promoting lipid abnormalities, such as elevated levels of triglycerides and low-density lipoprotein (LDL) cholesterol, and reducing high-density lipoprotein (HDL) cholesterol levels. These lipid abnormalities contribute to the accelerated development of atherosclerosis, where plaques form within the arterial walls, increasing the risk of coronary artery disease, stroke, and peripheral arterial disease. Inflammation and oxidative stress also destabilize these plaques, making them more prone to rupture and causing acute cardiovascular events such as myocardial infarction and stroke.

Diabetic nephropathy, a common microvascular complication of T2DM, is characterized by progressive kidney damage leading to chronic kidney disease (CKD) and potentially end-stage renal disease (ESRD). The pathogenesis of diabetic nephropathy begins with hyperglycemia-induced glomerular hyperfiltration, which increases the workload on the kidneys. Over time, this leads to glomerular hypertrophy and thickening of the glomerular basement membrane. Mesangial expansion, driven by the accumulation of extracellular matrix proteins, further disrupts glomerular structure and function. Proteinuria, the leakage of proteins such as albumin into the urine, is a hallmark of diabetic nephropathy and indicates significant kidney damage. Inflammatory pathways and AGEs play crucial roles in this process, promoting fibrotic changes within the kidneys. The progressive loss of glomerular filtration rate (GFR) results in the gradual decline of kidney function, necessitating interventions such as dialysis or kidney transplantation in advanced stages.

Diabetic neuropathy encompasses a range of nerve damage types, with peripheral neuropathy being the most common. The pathophysiology of diabetic neuropathy involves both metabolic and vascular mechanisms. Chronic hyperglycemia leads to the activation of the polyol pathway, where excess glucose is converted to sorbitol and fructose. This accumulation of sugar alcohols within nerve cells causes osmotic stress and reduces the availability of important cofactors like myoinositol, disrupting normal nerve function.

Diabetic retinopathy is a leading cause of blindness in adults and results from damage to the small blood vessels in the retina, the light-sensitive tissue at the back of the eye. Chronic hyperglycemia damages these retinal blood vessels, causing them to swell and leak fluid, leading to the formation of microaneurysms, hemorrhages, and exudates. As the condition progresses, retinal ischemia triggers the release of growth factors like vascular endothelial growth factor (VEGF), promoting neovascularization—the growth of new, fragile blood vessels. These new vessels are prone to bleeding, which can cause vitreous hemorrhage and potentially lead to retinal detachment, a severe condition that can result in permanent vision loss.

These detailed explanations of the pathophysiology of complications associated with T2DM highlight the complex interplay of metabolic and vascular factors that contribute to the disease's morbidity and mortality. Understanding these mechanisms is essential for developing targeted therapies and management strategies to mitigate the impact of these complications on patients' lives.

Risk Factors

Genetic factors play a significant role in the susceptibility to T2DM complications. Variations in genes related to glucose metabolism, insulin signaling, and inflammatory pathways can influence individual risk. A family history of T2DM and its complications is a strong predictor, suggesting a hereditary component. Genome-wide association studies (GWAS) have identified multiple genetic loci associated with increased risk of T2DM and its complications. For example, polymorphisms in the TCF7L2

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gene are strongly linked to T2DM risk and progression. Epigenetic modifications, such as DNA methylation and histone modifications, also contribute to the pathogenesis and complications of T2DM by altering gene expression in response to environmental factors like diet and physical activity.

Lifestyle factors significantly impact the development and progression of T2DM complications. Diets high in refined sugars and unhealthy fats contribute to obesity and insulin resistance, exacerbating hyperglycemia and its associated complications. Physical inactivity further reduces glucose uptake by muscles, worsening insulin resistance. Sedentary behavior is linked to an increased risk of developing both T2DM and its complications, as regular physical activity improves insulin sensitivity and glycemic control.

Obesity, particularly central adiposity, is a major risk factor for T2DM and its complications. Adipose tissue, especially visceral fat, is metabolically active and secretes various adipokines and pro-inflammatory cytokines, such as leptin, adiponectin, and tumor necrosis factor-alpha (TNF-α), which contribute to insulin resistance and systemic inflammation. Weight management through diet and exercise is essential for reducing the risk and progression of T2DM complications. Nutritional interventions, such as low-carbohydrate diets, the Mediterranean diet, and the DASH (Dietary Approaches to Stop Hypertension) diet, have shown benefits in improving glycemic control and reducing cardiovascular risk factors.

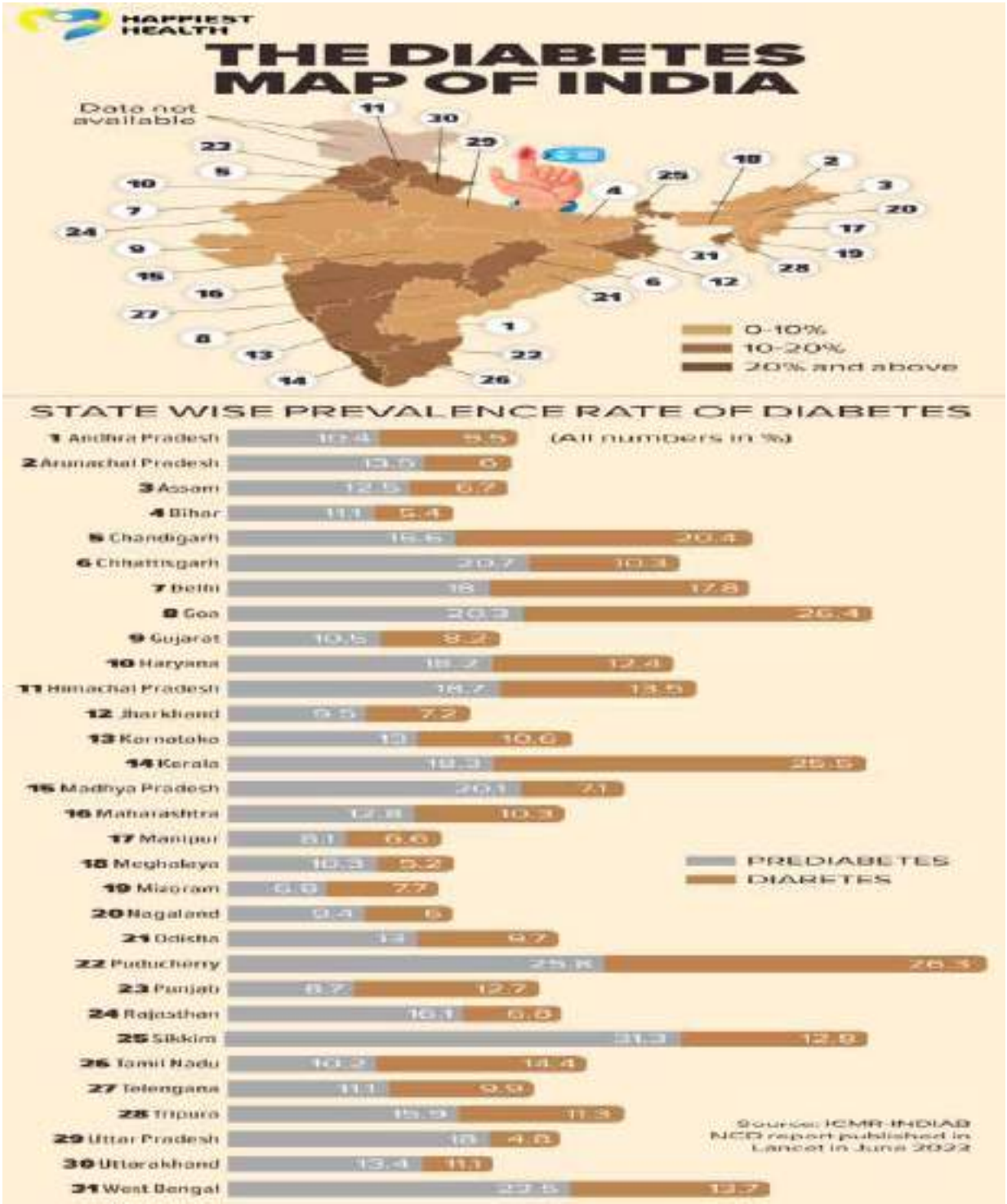
Poor glycemic control is a major risk factor for T2DM complications. Persistent hyperglycemia leads to both microvascular and macrovascular damage, increasing the likelihood of complications. Microvascular complications, including retinopathy, nephropathy, and neuropathy, result from damage to small blood vessels, while macrovascular complications, such as coronary artery disease, stroke, and peripheral artery disease, involve larger blood vessels. The duration and severity of hyperglycemia are critical determinants of complication risk, highlighting the importance of early and sustained glycemic control.

Effective glycemic control can significantly reduce the risk and progression of these complications. The landmark Diabetes Control and Complications Trial (DCCT) and the UK Prospective Diabetes Study (UKPDS) demonstrated that intensive glycemic control reduces the incidence and progression of microvascular complications. Targeting glycated hemoglobin (HbA1c) levels to below 7% is a common goal in diabetes management, though individualized targets may vary based on patient characteristics and comorbidities. Continuous glucose monitoring (CGM) and other advanced technologies provide real-time data, enabling better management of blood glucose levels and reducing the risk of both acute and chronic complications.

Management Strategies

Diabetes management is a multifaceted approach that involves lifestyle modifications, pharmacological interventions, and regular monitoring to prevent complications and improve quality of life. Effective management strategies are crucial in addressing the rising prevalence of diabetes in India. This section provides an overview of various management strategies and their importance in controlling diabetes.

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Source: ICMR June 2023

Pharmacological Interventions

Metformin: Metformin is widely regarded as the first-line treatment for T2DM. It works primarily by improving insulin sensitivity in the liver and peripheral tissues, thereby reducing hepatic glucose production and enhancing glucose uptake. This dual action helps in lowering blood glucose levels effectively. Metformin also has a favorable safety profile, with gastrointestinal side effects being the most common adverse reactions. Additionally, metformin is associated with modest weight loss, which can be beneficial for overweight or obese patients.

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SGLT2 Inhibitors: Sodium-glucose co-transporter 2 (SGLT2) inhibitors are a newer class of medications that work by promoting renal glucose excretion. By inhibiting the SGLT2 protein in the proximal tubule of the kidney, these drugs reduce glucose reabsorption, leading to increased glucose excretion in the urine. This not only helps in lowering blood glucose levels but also provides cardiovascular and renal benefits. Studies have shown that SGLT2 inhibitors reduce the risk of cardiovascular events, heart failure, and progression of renal disease, making them a valuable addition to T2DM management.

GLP-1 Receptor Agonists: Glucagon-like peptide-1 (GLP-1) receptor agonists enhance insulin secretion in a glucose-dependent manner, suppress glucagon release, and delay gastric emptying. These actions help in improving glycemic control and promoting satiety, which can lead to weight loss. GLP-1 receptor agonists have also been shown to reduce cardiovascular risk in patients with T2DM, providing dual benefits in glucose management and cardiovascular protection.

Cardiovascular Risk Management:
Statins: Statins are essential in managing dyslipidemia in patients with T2DM. They work by inhibiting the enzyme HMG-CoA reductase, which plays a key role in cholesterol synthesis. Lowering LDL cholesterol with statins has been shown to significantly reduce the risk of cardiovascular events, including heart attacks and strokes. Given the high cardiovascular risk associated with T2DM, statin therapy is often recommended even for patients with relatively normal lipid levels.

Antihypertensives: Controlling blood pressure is crucial in reducing the risk of cardiovascular and renal complications in T2DM. Antihypertensive medications, such as ACE inhibitors, angiotensin II receptor blockers (ARBs), calcium channel blockers, and thiazide diuretics, are commonly used. These medications help to lower blood pressure and protect against heart failure, stroke, and progression of diabetic nephropathy. Regular monitoring and individualized treatment plans are essential to achieve optimal blood pressure control.

Antiplatelet Agents: Aspirin and other antiplatelet agents are used to prevent thrombotic events in high-risk T2DM patients. By inhibiting platelet aggregation, these drugs reduce the risk of heart attacks and strokes. The decision to use antiplatelet therapy should be based on a careful assessment of cardiovascular risk and potential bleeding risks.

Renal Protection:
ACE Inhibitors/ARBs: Angiotensin-converting enzyme (ACE) inhibitors and angiotensin II receptor blockers (ARBs) are vital in slowing the progression of diabetic nephropathy. These medications reduce proteinuria and lower blood pressure by inhibiting the renin-angiotensin-aldosterone system (RAAS). By reducing intraglomerular pressure and preventing glomerular hypertrophy, ACE inhibitors and ARBs help protect kidney function and delay the onset of ESRD.

Neuropathy Management:
Pain Management: Neuropathic pain in T2DM can be debilitating. Medications such as pregabalin, duloxetine, and gabapentin are commonly used to alleviate neuropathic pain. These drugs work by modulating pain pathways and neurotransmitter levels, providing relief from pain, tingling, and numbness. However, managing neuropathic pain often requires a multimodal approach, including both pharmacological and non-pharmacological interventions.

Alternative Therapies: Physical therapy, acupuncture, and transcutaneous electrical nerve stimulation (TENS) are alternative therapies that can complement pharmacological treatments for neuropathy. These therapies can improve nerve function, reduce pain, and enhance overall quality of life for patients with diabetic neuropathy.

Lifestyle Modifications
Dietary Changes:
Low-Carb Diets: Low-carbohydrate diets are effective in reducing blood glucose levels and promoting weight loss. By minimizing carbohydrate intake, these diets help to decrease postprandial glucose spikes and improve overall glycemic control. Low-carb diets can also improve insulin sensitivity and reduce the need for medications in some patients.

DASH Diet: The Dietary Approaches to Stop Hypertension (DASH) diet focuses on reducing blood pressure and improving cardiovascular health through balanced nutrition. It emphasizes the intake of fruits, vegetables, whole grains, lean proteins, and low-fat dairy products while limiting salt, saturated fats, and added sugars. The DASH diet has been shown to be effective in managing both hypertension and T2DM.

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Exercise:
Aerobic Exercise: Regular aerobic exercise, such as walking, cycling, and swimming, improves cardiovascular fitness and insulin sensitivity. Aerobic activities help to lower blood glucose levels, reduce body weight, and improve lipid profiles. Incorporating at least 150 minutes of moderate-intensity aerobic exercise per week is recommended for optimal benefits.

Resistance Training: Resistance training, involving weight lifting and muscle-strengthening exercises, enhances muscle mass and glucose uptake, aiding in glycemic control. Building muscle mass also increases basal metabolic rate, helping with weight management. Combining aerobic exercise with resistance training can provide comprehensive health benefits for T2DM patients.

Smoking Cessation:
Programs and Interventions: Smoking is a major risk factor for both cardiovascular and microvascular complications in T2DM. Smoking cessation programs and interventions, including counseling, nicotine replacement therapy, and medications, are essential in reducing these risks. Quitting smoking improves blood circulation, reduces inflammation, and enhances overall health outcomes in T2DM patients.

Technological Advancements
Continuous Glucose Monitoring (CGM):
Benefits: Continuous glucose monitoring (CGM) systems provide real-time glucose readings, helping patients and healthcare providers adjust treatment plans promptly. CGM allows for better detection of hyperglycemia and hypoglycemia, enabling more precise insulin dosing and lifestyle adjustments. It also offers valuable insights into glucose patterns and trends, facilitating more effective diabetes management.

Challenges: Despite its benefits, CGM can be costly and requires patient education on proper use. Ensuring access to CGM technology and training patients on how to interpret and act on the data are critical for maximizing its effectiveness.

Telemedicine:
Remote Monitoring and Management: Telemedicine facilitates regular follow-ups and personalized care, especially in remote areas. By leveraging digital health technologies, healthcare providers can monitor patients' glucose levels, medication adherence, and overall health status remotely. Telemedicine also enables timely interventions and supports patient education and engagement, improving diabetes management outcomes.

Future Directions and Emerging Therapies
Research on New Drug Targets:
Investigating novel pathways and molecules can lead to the development of more effective treatments for T2DM complications. This includes targeting inflammatory pathways, oxidative stress, and advanced glycation end-products (AGEs). Understanding the underlying mechanisms of T2DM at a molecular level can reveal new therapeutic targets and lead to the development of innovative drugs that address the root causes of the disease and its complications.

Advances in Biomedical Technology:
Utilizing artificial intelligence (AI) and machine learning can enhance the prediction, diagnosis, and management of T2DM complications. AI algorithms can analyze large datasets to identify patterns and predict disease progression, enabling personalized treatment plans. Machine learning models can also assist in discovering new drug targets and optimizing existing therapies. Integrating AI into clinical practice can improve patient outcomes by providing more precise and individualized care.

Integrative and Holistic Approaches:
Combining conventional and alternative medicine practices, such as using nutraceuticals and lifestyle interventions, can offer a more comprehensive approach to managing T2DM and its complications. Nutraceuticals, including vitamins, minerals, and herbal supplements, may provide additional benefits in glycemic control and complication prevention. Integrating holistic practices, such as mindfulness, stress management, and acupuncture, can also support overall well-being and improve the quality of life for T2DM patients.

CONCLUSION

In conclusion, Type 2 Diabetes Mellitus (T2DM) is a multifaceted disease characterized by insulin resistance and progressive beta cell dysfunction, resulting in chronic hyperglycemia. This condition is associated with a range of complications, including cardiovascular disease, nephropathy, neuropathy, and retinopathy, each of which significantly impacts patient morbidity and mortality. Understanding the intricate pathophysiological mechanisms underlying these complications is crucial for developing targeted and effective management strategies.

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The pathophysiology of T2DM complications involves a complex interplay of metabolic and vascular factors. Chronic hyperglycemia leads to the formation of advanced glycation end-products (AGEs), inducing oxidative stress and inflammatory responses that contribute to endothelial dysfunction and vascular damage. Insulin resistance exacerbates these issues by promoting dyslipidemia and further impairing glucose metabolism. These processes are central to the development and progression of diabetic complications, underscoring the importance of maintaining optimal glycemic control.

Several risk factors contribute to the development and progression of T2DM complications. Genetic predisposition, lifestyle factors such as diet and physical activity, and metabolic control are critical determinants. Genetic variations in genes related to glucose metabolism and insulin signaling, combined with epigenetic modifications, influence individual susceptibility to complications. Lifestyle factors, including diets high in refined sugars and unhealthy fats and physical inactivity, exacerbate insulin resistance and hyperglycemia. Effective management of these risk factors through dietary changes, regular exercise, and weight management is essential for mitigating the impact of T2DM complications.

Management strategies for T2DM and its complications encompass a combination of pharmacological and lifestyle interventions. Pharmacological treatments such as metformin, SGLT2 inhibitors, and GLP-1 receptor agonists play a vital role in improving glycemic control and reducing the risk of complications. Cardiovascular risk management with statins, antihypertensives, and antiplatelet agents, as well as renal protection with ACE inhibitors and ARBs, are crucial components of comprehensive care. Neuropathy management includes both pharmacological treatments and alternative therapies to alleviate pain and improve nerve function.

Lifestyle modifications are equally important in managing T2DM. Dietary interventions such as low-carbohydrate diets and the DASH diet can help improve glycemic control and cardiovascular health. Regular physical activity, including aerobic exercise and resistance training, enhances insulin sensitivity and aids in weight management. Smoking cessation programs are critical in reducing the risk of cardiovascular and microvascular complications.

Technological advancements, such as continuous glucose monitoring (CGM) and telemedicine, have revolutionized diabetes management. CGM provides real-time glucose readings, enabling more precise insulin dosing and lifestyle adjustments, while telemedicine facilitates remote monitoring and personalized care, particularly in underserved areas. Future directions in T2DM management include the exploration of new drug targets, advances in biomedical technology such as artificial intelligence, and integrative approaches combining conventional and alternative medicine practices.

Overall, a multifaceted approach is essential for effectively managing T2DM and its complications. By understanding the underlying pathophysiology and addressing key risk factors, healthcare providers can develop comprehensive and personalized treatment plans that improve patient outcomes and quality of life. Ongoing research and innovation continue to offer promising avenues for enhancing the management of T2DM and mitigating its significant health impacts.

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IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGIES ON HUMAN OUTLOOK IN THE DIGITAL WORLD

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ABSTRACT
In the past, technological progress had a positive impact on our society, leading to an increase in labor productivity, wages and well-being. Right now, a new technological wave of digitization and intelligent automation - a combination of artificial intelligence, robotics and other technologies - is fundamentally changing the way we work at an unprecedented pace. For example, data analytics, the Internet of Things, and drones are already being used in many industries to make manufacturing processes better, faster, and cheaper.
KEY WORDS: *digital world, digital society, information policy of the state, electronic government, smart village, augmented reality.*

INTRODUCTION

Articles and books written about the digital world are always "old". The factor that makes records "obsolete" is the lightning speed of processes in the world of technology. Therefore, there is always the fear that ideas and thoughts written about digital technologies will lose their "newness" in a short time. But we must keep up with the technological pace, because, as the Russian writer Maxim Gorky said, we cannot go far in the carriage of the past. Therefore, the level of citizens' use of new technological tools in the digital environment is considered an important factor of comprehensive development. This, of course, leads to the need to ensure digital equality. "Analysis shows that some countries that cannot give up their desire for hegemony are still trying to influence developing countries, imperialist figures indulge in the pleasure of exporting democratic ideas, and sometimes disdain national values that have survived the test of time. . Information attacks carried out for geopolitical purposes are moving to social networks" [1. - B. 21.].

MATERIALS AND METHODS

Digital divide, information inequality means the inequality of electronic consumers in the digital environment, their access to this environment, and the inadequacy of the digital terms and conditions provided to them. That is, unequal information consumption between underdeveloped countries, between the capital and district, between villages and remote settlements is a digital gap. The information society or the knowledge society is not just a beautiful vision of a bright future that has nothing to do with reality. This is, in fact, the next stage of human development. Elements of the new society already exist today and are based on computer and telecommunication technologies. it is a factor that ensures the competitiveness of the nation within the framework of interests. "Now, national economies cannot be competitive without fully using information technologies. Many countries of the world are trying to ensure their future through the consistent development of information technologies". [2. - B. 84.]

In the age of the information society, the digital divide is becoming one of the most important factors that separate people from the rich and the poor. In 1997, the United Nations Development Program introduced a new measure of poverty - the amount of information that determines access to the information highway for the general population. Sociologists emphasize that the main conflict in the system of production relations is the conflict between knowledge and incompetence. Therefore, the economic and social concept of "Internet lifestyle" has appeared, describing people's lives in developed countries, where using the Internet is as natural as, for example, a phone call. The new way of life is characterized by its unique dynamism, easy and quick access to the most diverse information needed by a person both at home and at work, and constantly improving professional knowledge. In this regard, the following comments of A. Mominov are noteworthy: "If the power of the states was determined according to the number of inhabitants and the size of the territories before the first industrial revolution, then between the first and second industrial revolutions it was determined according to the types of energy in the state's possession and their amount. At the present time, the power of the state is primarily determined by information resources, that is, knowledge possessed by the state and to what extent it is used in production" [3. B. 148.].

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Knowledge is a passive guest, it must be sought, it requires great effort. Nowadays, most of our society prefers a good book to a computer connected to the Internet. In the early days, the Internet was invented for military purposes, but later it expanded its capabilities and became a source of other opportunities.

The Greek philosopher and mathematician Archimedes said: "Give me a fulcrum and I will change the world." Today, we can say for sure: the Internet is the fulcrum that enables the transformation of culture and education. According to A. Tashanov: "...the further deepening of the information revolution, the creation of technical tools and psychological mechanisms that affect a person will make it possible to form the worldview of an individual in a context different from traditional culture. This creates conditions for the emergence of completely new forms of ideologies that lie outside traditional political, religious or other concepts" [4. B. 109.].

RESULT AND ANALYSIS

Today there is a huge gap in society between those who have access to the Internet and those who do not. For those on the first list, great opportunities open up: free and fast access to information, transfer of information from one end of the world to another, from weather information to job search. Of course, all this allows them to start a new life. If the Internet is open to everyone, it will be an advantage not only for the educational system, but also for the cultural society.

To understand the influence of the Internet on culture and education, it is necessary to consider it as a global phenomenon. One of the most important areas of influence of the Internet on culture is education. There is no culture without education. The modern education system, which has begun to include new pedagogical technologies, often changes the "packaged" culture. F. Madrahimova stated: "In the age of information, if security is not ensured against the entry of information that has a negative impact on the development of the country, the threats under the guise of "mass culture" and other similar ideological threats will continue to increase. This is one of the threats that destroy the national development of the nation from within" [5. - B. 146.].

Today, educational centers are directing students to learn more from the Internet. Writing essays, term papers, and theses has long made sitting among dusty books in libraries a fun and engaging means of traveling the world's global networks. Sometimes they refer to the Internet as a tool that will make the next generation illiterate and brain dull.

We can't begrudge this boon of technology if, instead of going through the trouble, a student downloads ready-made essays and leaves on his own. We need to know the benefits and harms of this and make it useful.

It should be noted that today, young people, who are the basis of our society, spend most of their free time in front of the television, and later in front of the computer. Both tools have a great influence on the formation of the young generation.

Unfortunately, it is very difficult to mention the educational and educational features of television today. The same thing actually happens on the Internet. It is necessary to control both tools both pedagogically and psychologically, and to expand their positive effect. "It seems that everyone knows what information is by hand, but a simple concept is undergoing such changes that now humanity is in a hurry, unable to understand what it is and what benefits it is capable of" [6. B-17.].

With the introduction of the Internet into people's lives in recent years, Internet cafes that have opened in every neighborhood have a greater impact on young people than on adults. In particular, some Internet cafes established near schools have become a meeting place for students who drop out of school and do not attend classes, because the purpose of some Internet cafes is students. - is increasing day by day. The activities of those who enter the Internet club, most of them pay attention to erotic and pornographic sites.

The more services enter the virtual space, the more difficult it will be for people without access to the Internet to find work, improve their education and succeed in business. Preference will be given to applicants who know how to use a computer and the Internet. The more services enter the virtual space, the more difficult it will be for people without access to the Internet to find work, improve their education and succeed in business. Preference will be given to applicants who know how to use a computer and the Internet. The more services enter the virtual space, the more difficult it will be for people without access to the Internet to find work, improve their education and succeed in business. “Recent innovations in information technology are challenging our traditional notions of how to live a good and productive life and how to make sure that the digital world reflects our moral values. Ethical issues related to artificial intelligence are causing increasing trust, accountability, citizenship and consensus in online spaces”[7].

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DISCUSSION

According to Internet and high-tech expert Aflotun Mammadov, the digital divide and information inequality are defined by the following criteria:
Income level of society, family structure, level of education, etc. as a result, it is becoming difficult for a certain part of citizens to access information on the Internet;

Differences in the use of ICT in different social groups of the population in connection with the level of information use in science, culture, education, medicine and other fields;

A new type of social stratification arising from the diversity of ICT access;
The fate of information structures, tools and processes, their uneven distribution among citizens in matters of civil rights and material well-being.

Today, 15% of humanity creates almost all technological innovations in the world, about half manage to accept and master them, and the remaining third is excluded from these processes. If this continues, the rich and educated nations will become richer and more educated, while the poor will become poorer and weaker. If humanity does not overcome the digital divide in time, new technologies full of great opportunities will lead to further stratification of society. A planet with different levels of prosperity cannot have long-term stability and peace.

It is clear that information illiteracy in the regions cannot be eliminated without state-level support. At the same time, the task of developing the state information policy in this area faces an important problem - the problem of quantitative measurement of inequality. The question may arise: what are we trying to equalize and how should we measure the degree of elimination of inequality? According to experts, it is necessary to take into account local characteristics when developing methods for measuring the digital difference. There is a significant group of former Soviet scientific and technical intellectuals in Uzbekistan, and their demand for information is formed based on personal needs for new knowledge. In a number of countries, they are implementing interesting educational projects to ensure digital equality.

CONCLUSION

Therefore, digital inequality is not only a problem of individuals, but also of all countries and regions. In the near future, instead of talking about "poor countries", politicians will start talking about "ignorant countries". States are obliged to give priority to the improvement of the educational level and professional qualification of their citizens, because even today competitiveness is determined by the availability of highly qualified personnel. It is inevitable that countries that have not been able to raise the level of scientific development, and have not been able to fully use the wealth of knowledge, will fall behind their neighbors. As a result, the economic and social inequality of peoples in the world will increase.

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ASCETICISM IN THE EARLY ISLAMIC PERIOD CONCEPT FORMATION PROCESSES

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ABSTRACT
This article analyzes the evolution of the phenomenon of asceticism (zuhd) in the early periods of Islam, as well as the ascetic movements observed in the 1st-2nd centuries of the Hijri, regional and common characteristics of the first schools of asceticism, related to the phenomenology of religion, which is one of the fields of religious studies.
KEY WORDS: *Islam, asceticism, asceticism, authority, Hanif, schools of asceticism, Sufism.*

INTRODUCTION
The religion of Islam, which arose in the Arabian Peninsula in the 7th century and soon spread to many countries of Asia, Africa and Europe, introduced not only a new form of faith, but also a new way of life and social relations to the peoples of these regions.

Asceticism, formed within the framework of Islamic teachings, is a practical and intellectual process manifested as a renunciation of material wealth and desires on the one hand, and as an attempt to keep oneself low on the other.

MATERIAL AND METHODS
The dictionary meaning of the word "Zuhd" is interpreted differently in different encyclopedias. For example, it is said that "Zuhd is only in worldly affairs, and it is the opposite of desire and lust for the world"[1].

In the literal sense, "Zuhd is to make a soul out of what you can get your hands on"[2].
If we analyze the processes related to asceticism, it can be observed that it existed in different forms in different nations even before Islam. Consequently, al-Wasaniyya (polytheism) and resistance to idolatry were observed in pre-Islamic ascetics. At this point, it is necessary to emphasize that in pre-Islamic Arabia, ascetic movements were observed in the activities of the Hanifs. The Hanifs did not worship pagan gods, followed a strict ascetic practice (strict adherence to purity, living in honor, etc.) and lived without joining Jews or Christians. Waraqa ibn Nawfal, Abu Qays Sarma ibn Anas can be mentioned as bright representatives of this trend[3]. According to the dictionary "Mu'jamu-l-wasit" the word "Hanif" is interpreted as "turning from evil to good"[4].

Although the researchers often gave abstract, contradictory opinions about the Hanifs, they unanimously emphasized that they were an anti-polytheistic group. The Hanifs openly rejected the idolaters and called to resist the widespread alcoholism, gambling and other harmful vices among the Arabs of that time. Of course, their call was opposed by the nobles, officials and those who served the dates. Many hanifs were forced to live like dervish-kalandars and wander around the country without settling in one place. The Hanifs cannot be imagined as representatives of an independent religion like the Jews or Christians. They can be given the quality of people who belong to different tribes, who are not connected to each other by great ties, and who are mainly anti-dates and busy with the idea of calling for reform. In his "Sira", Ibn Hisham gives short biographies of Zayd ibn Amr, Waraqa ibn Nawfal, Ubaydullah ibn Jahsh, Usman ibn Huwayris from the Hanifs, and notes that they formed a small group (usba) and denied the obedience prayers and rituals of the Quraysh.

RESULT AND ANALYSIS
The researchers emphasize that the spirit of asceticism began in Islam from the time of the Prophet (peace be upon him), and they point to the companions and subjects as the first ascetics in Islam. Even during the time of the Prophet (pbuh), some Companions such as Abu Zar Ghafiri, Huzaifa ibn Yamani, and Salman Farsi showed an ascetic attitude and lifestyle.

In particular, the Arab researcher Abdul Qadir Isa emphasizes that the first centuries of Islam were the time of pious and pious people, people who devoted themselves completely to God[5].

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The mystic scholar A.D. Knish also notes that the ascetic sentiments that are the basis of Sufism appeared at the same time as Islam, while pointing out that the ascetic-Sufi movement in the literal sense appeared later.[6] There are also opinions about the social origin of the first ascetics based on specific approaches. While some researchers point out that they originated from Muhaddis in most cases, according to A. Knish, in the social structure of the first form of Sufism, asceticism, in addition to Muhadis, there were also Qissaguys, Qaris, participants in border battles with Byzantium, pious merchants and craftsmen[7].

The movement of ascetics who lived in the early days of Islam was based on certain hadiths, which stated that the world is transitory, deceitful, and worthless compared to the life of the hereafter, and recommended a life of asceticism. According to researchers, the following verses of the Holy Qur'an arouse ascetic moods in ascetics: "So, do not let the life of the world (with its transitory blessings) deceive you" (Lukman-31:33), "This life of the world is only (one-breath) entertainment. If only they knew, the land of the Hereafter (mangu) is life (land)" (Ankabut-29:64). "Property, children, this life is the adornment of the world" (Kahf -18:46), "Always remember the name of your Lord and free your heart from everything and turn to Him with true sincerity!" (Muzammil-73:8) and other verses point to not giving too much to the world, the real idea is to gain the life of the hereafter[8].

At the beginning of the 1st and 2nd centuries of Hijri, the attitude of asceticism affected almost all areas of Islam. It is often possible to witness the use of the terms "nisk", "qanoat" and "vara'" in this period. But in the second century of the Hijri, these words were replaced by the term "zuhd". It can also be seen that it was customary to add the name "zahid" to the names of most of the medieval Muslim scholars.

The idea of gaining God's approval and entering heaven and escaping the torment of hell was observed in the ascetics in the early Hijri centuries. While the concept of asceticism based on "fear" prevailed among the ascetics of this period, the concept of "divine love" introduced by one of the famous Sufis of this period, Rabiyatul Adaviya (d. 130/752), discovered a new form in the worldview of the ascetics[9]. “Бинобарин зоҳидлик йўналишида янги босқич – илоҳий муҳаббатга йўғрилган зуҳд босқич пайдо бўлди.

Ҳижрий II аср охиригача зуҳд шахсий масала бўлиб қолса ҳам, баъзи минтақаларда машҳур зоҳидларнинг қарашлари ва амалиётларига эргашган йўналишлар, мактаблар шаклланганини кўриш мумкин. Дастлабки зуҳд мактаблари сифатида Мадина, Куфа, Басра, Хуросон ва Мовароуннаҳр зоҳидлик мактабларини келтириш мумкин”.
Consequently, a new stage appeared in the direction of asceticism - the stage of asceticism devoted to divine love.

DISCUSSION

Although asceticism remained a private matter until the end of the 2nd century A.H., it is possible to see the formation of sects and schools following the views and practices of famous ascetics in some regions. As the first ascetic schools, we can cite Madinah, Kufa, Basra, Khurasan and Mowarounnahr schools of asceticism.

At this point, among some western researchers, there is a widespread opinion that a special way of reaching spiritual perfection has been developed in Islam under the influence of Christian asceticism[10]. According to some Western Islamic scholars, the concept of asceticism was shaped by the influence of Christian monasticism, Monism, and the Indian tradition and developed in accordance with the tradition of Sufism. For example, the Swedish orientalist and researcher T. Andre concludes that there is a similarity between asceticism in Islam and Christian asceticism. A number of reasons are given as the basis for this opinion: among them, the close communication of Muslims with the Christian population in Syria and other new regions of the caliphate; that in the history of Islam there were many Christians who converted and others[11]. The elements of Christian asceticism in the early ascetics: renunciation of worldly goods, self-abnegation, voluntary poverty, voluntary hunger, etc., probably had similarities with the monastic tradition in Christianity[12]. But this is only an external similarity in shape. For example, Ka'b ibn Ahmar and Malik ibn Dinar from the subjects said about Amir ibn Abdullah, who was one of the first ascetics, "he is the monk of this community (Muslim community)"[13]. According to their testimony, Amir bin Abdullah slept in a standing position, constantly fasted, and prayed about a thousand rakats every night[14].

Researchers have expressed different opinions about the formation process of asceticism, and it is emphasized that these processes were motivated by a number of factors, including religious, social, economic, political and ideological reasons[15].

In addition to those who interpret asceticism as the first stage of Sufism, there are also views among some scholars that asceticism developed separately from Sufism. As a proof of this, they explain that asceticism continued separately from Sufism: "If Sufism was the next stage of asceticism, asceticism would have disappeared during the period when Sufism developed. But the sources mention that during the Mamluk period, most of the Egyptian jurists and scholars were not Sufis, but ascetics.

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CONCLUSION

In conclusion, it should be noted that in the early days of Islam, asceticism was formed based on verses and hadiths, while in later periods, the views of certain personalities served as the basis of asceticism. Also, the views of the representatives of the ascetic schools listed above had their influence on the ascetic views of the later period. At the same time, two different approaches were distinguished regarding the formation of asceticism, that is, asceticism itself was manifested as a separate practice and as the initial stage of Sufism. Along with the formation of systematic views on zuhd, special literature was created on this topic. In almost all the literatures of the classical period, there is a section (chapters) related to asceticism, in particular, in the classical works of Sufism by scholars such as Kalabadi, Qushayri, Abu Talib Makki, and Imam Ghazali, separate chapters are devoted to this topic. Also, in the early days of Islam, it was customary to collect hadiths on the topic of asceticism separately, and independent instructions on the practice of asceticism, as well as books on the description of asceticism, were published.

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ON Q*g-CLOSED SETS

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ABSTRACT
*The author introduced the notion of Q*g-closed sets in the paper entitled "Q*g-closed sets in topological space" by P. Padma and S. Uday Kumar [5]. However, there is a false theorem, namely Theorem 3.4. The correct statement of Theorem 3.4 is mentioned in this paper with correct proof and gave a counter-example in support of this theorem.*
KEYWORDS: *regular open, π-open, g-closed, Q*-closed and Q*g-closed sets. 2020 AMS Classification: 54A05.*

1. INTRODUCTION

In 1958, K. Kuratowski [**2**] introduced and investigated the notion of regular open sets and obtained their properties. In 1968, V. Zaitsev [**7**] introduced and studied the concept of π-open sets and obtained their basic properties. In 1970, Levine [**3**] initiated the investigation of g-closed sets in topological spaces, since then many modifications of g-closed sets were defined and investigated by a large number of topologists. In 1993, N. Palaniappan and K. C. Rao [**6**] introduced the concept of rg-closed sets and obtained some properties of rg-closed sets in topological spaces. In 2000, Dontchev and Noiri [**1**] studied the concept of πg-closed sets and obtained some basic properties. In 2010, M. Murugalingam and N. Lalitha [**4**] introduced and studied the concept of Q*-open sets and obtained some properties of Q*-open sets in topological spaces. In 2015, P. Padma and S. Udaya Kumar [**5**] introduced the notion of Q*g-closed sets in topological spaces and obtained some properties of Q*g-closed sets.

In this paper, we study the notion of Q*g-closed sets in the paper entitled "Q*g-closed sets in topological space" by P. Padma and S. Uday Kumar [**5**], published in Int. J. of Adv. Res. in Engg. and Appl. Sci. However, there is a false theorem, namely Theorem 3.4. The correct statement of Theorem 3.4 is mentioned in this paper with correct proof and gave a counter-example in support of this theorem.

2. PRELIMINARIES

Throughout the present paper, spaces always mean topological spaces on which no separation axioms are assumed unless explicitly stated and $f : (X, \Im) \to (Y, \sigma)$ (or simply $f : X \to Y$) denotes a function f of a space $(X, \Im)$ into a space (Y, σ). Let A be a subset of a space X. The closure and the interior of A are denoted by cl(A) and int(A), respectively. A subset A of a space X is said to be **regularly open** or **open domain** [**2**] if it is the interior of its own closure or, equivalently, if it is the interior of some closed set. A complement of an open domain subset of X is called **closed domain** (or A subset A is said to be **regular open** [**2**] (resp. **regular closed**) if $A \subset int(cl(A))$ (resp. $A \subset cl(int(A))$). The finite union of regular open sets is said to be π-**open [7]**. The complement of a π-open set is said to be **π-closed.**

regular open → π-open → open

Where none of the implications is reversible [**1**].

2.1 Definition. A subset A of a topological space $(X, \Im)$ is said to be
(1) **g-closed** [**3**] if $cl(A) \subset U$ whenever $A \subset U$ and $U \in \Im$.
(2) **πg-closed** [**1**] if $cl(A) \subset U$ whenever $A \subset U$ and U is π-open.
(3) **rg-closed** [**6**] if $cl(A) \subset U$ whenever $A \subset U$ and U is regular open.

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In the definition of g-closed set, we use U as an open set, in the definition of πg-closed set, we use U as a π-open set and in the definition of rg-closed set, we use U as a regular open set.

The complement of a g-closed (resp. π-closed, rg-closed) set is said to be **g-open** (πg-open, rg-open**).**

2.2 Remark. We summarize the fundamental relationships between several types of generalized closed sets in the following diagram. None of the implications is reversible [**1**].

closed → g-closed → πg-closed → rg-closed

3. Q*g-CLOSED SETS

3.1 Definition. A subset A of a topological space X is said to be Q***g-closed* [**5**] if cl(A) ⊂ U whenever A ⊂ U and U is Q*-open.

3.2 Remark. Every Q*-open set is open.

In the definition of Q*g-closed set, we use U as a Q*-open set but in the definition of g-closed set, we use U as an open set. So the correct statement of the **Theorem 3.4** is as follows:

3.3 Theorem. Every g-closed set is Q*g-closed set.
Proof. Let A be g-closed set in X and A ⊂ U where U is Q*-open set. Since every Q*-open set is open and A is g-closed set, cl(A) ⊂ U. Hence A is Q*g-closed set.

Converse of the above theorem is not true and is shown by the following example:

2.3 Example. Let X = {a, b, c} and ℑ = {ϕ, X, {a}, {b}, {a, b}}. Then
(i) closed sets are : ϕ, X, {c}, {a, c}, {b, c}.
(i) Q*-closed sets are : ϕ, {c}.
(i) g-closed sets are : ϕ, X, {c}, {a, c}, {b, c}.
(i) Q*g-closed sets are : ϕ, X, {b}, {c}, {a, c}, {b, c}.

In the above example, every g-closed set is Q*g-closed but converse is not true. In the above example, the set A = {b} is Q*g-closed but not g-closed.

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THE RISE OF PRIVATIZATION IN HEALTH SECTOR: EXPLORING THE RELATIONSHIP BETWEEN PRIVATE HEALTH CARE AND THE UPPER CLASS

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ABSTRACT

In the past twenty years, the transfer of health care services from public to private ownership has been a topic of significant interest in almost every country worldwide. Privatization and the free-market system have become attractive options for countries dealing with rising healthcare costs, growing dissatisfaction with the effectiveness and quality of care in public health facilities, and limited public resources to support healthcare services. The purpose of the research to explore the relationship between private health care and the upper class. The study identifies the causes of privatization, including globalization, modernization, urbanization, capitalism, neoliberal policy formation, and people's access to it. This study is based on primary data. In order to collect primary data, a comprehensive study questionnaire was designed, including both structured closed-ended and open-ended questions, and data have been collected randomly from ten private hospitals in Madaripur. The research included a sample size of 130 respondents, consisting of 110 patients, 20 nurses, and hospital authorities. The findings conclude that private health care is the outcome of elites' demand, which is decorated with advanced facilities. In a public hospital, it is impossible for a patient to anticipate a simple pathological or radiological examination. Patients ultimately find themselves compelled to visit private clinics. However, the high cost of these clinics often restricts people's access to them. Aside from this, capitalism has given birth to private ownership and class categorization in society, while neoliberal policy has reduced government control over public expenditure. Market competition, individual responsibility, consumer choice, and lifestyle change have also increased the privatization of health services in Madaripur, as well as in the larger cities of Bangladesh.

KEYWORDS: *privatization, health care, globalization, capitalism, public health, neoliberal policy*

1. INTRODUCTION

The inverse relationship between social class and health sector privatization is widely recognized. This relationship has endured throughout the processes of industrialization, globalization, urbanization, modernization, and the formulation of neoliberal policy. The most significant and pervasive global trend in health care over the past decade has been the increasing prevalence of profit-oriented health care and its marketization across societies. Economic globalization, urbanization, modernization, and liberalization have all been mirrored by this process in the health care sector. Although private medical practices have been recognized for an extended period, the commercialization, corporatization, and marketization of health care are phenomena that emerged during the final quarter of the 20th century. During the late 1970s and early 1980s, the process grew in significance, affecting both developed and developing countries. It imposed a fiscal constraint on government budgets and encouraged them to reduce public expenditure in the social sector. This expanded the potential for the private sector to expand its healthcare services. These privatizations have been influenced by national policies, global policy administrations, and multilateral institutions. This privatization has been given a new dimension by the neoliberal policy agenda. These policies have not only promoted the marketization of health services but have also endeavored to restructure public services by implementing market principles. Privatization is also promoted by budgetary constraints and public failure. The private sector is significantly influenced or determined by the socioeconomic status of individuals. The private sector is particularly accessible to the upper-class population. However, the process of modernization has resulted in a significant transformation in the way people live, and quality health services are now preferred by all socioeconomic groups, despite their high cost. The disciplines of privatization and social class are highly prioritized by social scientists.

Privatization, private property ownership, and various socioeconomic conditions are extensively discussed by distinguished sociological scholars. The private sector has been the focus of the industrialization, globalization, and liberalization process, which has resulted in monopoly market systems that are founded on neoliberal policies, global policy regimes, and national policies. The privatization of public enterprises, neoliberalism, class ideologies, and higher education are the primary focus of the preponderance of research. Bangladesh is a developing nation with a concentrated population. A significant number of individuals are residing below the poverty line. Due to factors such as overcrowding, a scarcity of medical facilities and treatments, a lack of qualified and experienced medical specialists, and increasing corruption, numerous individuals encounter difficulties with the availability, accessibility, and affordability of medical facilities and treatments in government hospitals, the emergence of a new health sector,

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private healthcare, has been facilitated by these issues. This issue has also been further complicated by globalization, industrialization, modernization, and neoliberal policy. Nevertheless, this private health care is not accessible to all segments of the population. The availability of this private health care is contingent upon an individual's socioeconomic status.

The privatization of Bangladesh's health sector is a significant topic of discussion in the contemporary world, as it encompasses a vast area. Consequently, the objective of this investigation is to focus on this specific domain. The research primarily focuses on the factors that contributed to the privatization of health care, such as modernization, urbanization, and overall social and economic development. The high caliber of this private health care is the reason for its higher cost. The privatization of health care has been a direct result of the demands of the elites. The study's design, as a consequence, concentrates on the privatization of the health sector and upper-class relationship in the Madaripur region. The investigation encompasses a diverse array of methodologies for quantifying individuals' socioeconomic status and their access to private health care.

A vast area of sociology, including the upper, upper middle, middle, lower middle, and lower classes, is also covered by socioeconomic status, which has been discussed in this context. Sociology also emphasizes inequality and discrimination based on access to private health care. In addition to these, this investigation has implemented numerous sociological viewpoints, such as Karl Marx and Weber's interpretation of class struggle and class structure as private property in society, the theories of certain postmodernist philosophers, David Harvey's capital accumulation, and Manuel Castell's globalization.

2. REVIEW OF LITERATURE

A literature review is a crucial and indispensable component of the research process. A literature review enables the researcher to define the problem by focusing on specific elements within the broader field of study. Researchers critically analyze the existing body of literature according to their own areas of focus. The literature review is organized based on the researcher's methodology. Here is a review of several research aimed at organizing my literature according to the concerns stated in the literature.

In their study, Schlesinger, Bentkover, and Willer (1987) investigated how competition, ownership structures, and privatization affect the availability of hospital services. Service offerings. The term "privatization" is used to describe the transformation of hospitals and markets, when the focus shifts from serving the public and community-wide advantages, such as providing healthcare to the poor, to prioritizing the financial interests of the hospital. The data for this research was derived from a survey of physicians performed by the American Medical Association in 1984. The researchers determined that both ownership and the healthcare system had a significant influence on the number of people without health insurance. Expanding the for-profit market share from 0 to 50 percent would also introduce more access limitations.

Using survey and interview methods, Rose Wiles and Joan Higgins (1992) analyzed the doctor-patient interaction in the private sector. They divided their results into several stages. First and foremost, time considerations encompass the following: treatment speed, appointment convenience, availability of additional professional time, and reaction time when delivering information. Based on theoretical assumptions that nonprofit and for-profit hospitals will react differently, Schlesinger, Dorwart, Claudia, Hoover, and Epstein (1997) examined how rising hospital competition affects inpatient service access and how this relates to existing disparities in service provision. In 1987 and 1988, researchers surveyed mental institutions around the country to compile their findings. The results show that as price-based rivalry heats up, for-profit and non-profit hospitals are reacting to it in various ways and to varying degrees. Healthcare facilities in highly competitive marketplaces provided a wider range of services and embraced new innovations, but not everyone could afford them.

Bambas, Casas, Drayton, and Valdés (2000) examined many concerns related to health in the global economy, such as different economic structures and possible risks we encounter as we approach the end of this century. The subject matter of this study is centered around the experiences, possibilities, and threats in the Americas, the impact of health on human development, and the processes of international and regional integration in the new global economy. Several publications analyze the impact of economic reform measures on overall health, while several monographs include perspectives from civil society organizations in particular nations.

The study by Iriarta, Merhyb, and Waitzkin (2001) used quantitative and qualitative methods to examine "Managed Care in Latin America," with a focus on the spread of managed care from the US to Latin American nations. Multinational banks support private insurance, according to their research, whereas health service organizations, like the World Bank, support health care privatization and corporatization. Through privatization, a competitive and market-oriented approach to health care quality, competition, and improved overall performance, patients have the right to select, experience variety, and obtain high-quality health care.

Collins (2003) asserts that access to healthcare, economic growth, and global health trends are all being impacted by globalization. Access to healthcare is severely impacted by international inequality, especially in transitional economies. Services are used less often by the poor, and transitional economies suffer difficulties. Globalization can improve health in nations with robust regulatory

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frameworks, competitive home markets, and social safety nets. The WHO wants to help countries improve health services, but since governments aren't as involved in health care policy as they once were, medical institutions are increasingly being shaped by the neoliberal economic paradigm. Health is becoming more and more seen as a personal benefit. Collins claims that a centralized health system no longer offers universal access to care for communities in transitional economies, and that some groups even refuse the most basic medical care.

Hans Maarse (2006) observed "modern reform programs" in eight European public-private health care mixtures. Like prior comparative studies, he examined European health system development from four angles: finance, provision, administration and operations, and investment. Privatization implies neoliberal policy preferences, the study found. Other factors include budgetary strain, public failures owing to poor quality, long wait times, or other patient issues, medical technological breakthroughs, and social and political changes. He also noted how privatization impacts health system costs, sustainability, efficiency, accessibility, solidarity, quality of treatment, health status, and choice. According to Maarse, values, political resistance, expanding public activity, private failures, the impossibility of effective macro-cost control, cost shifting to the public sector, cherry picking, growing state dependence on self-interested players, restricted access to health care, and less public accountability hinder privatization.

Waitzkin, Jasso-Aguilar, and Iriart (2007) conducted a comprehensive analysis of the significant proportion of medical costs in the most impoverished nations globally. Their study focused on examining the impact of private insurance and the privatization process in several Latin American countries. The researchers employed a multi-method approach, gathering data from three distinct sources: a comprehensive examination of existing literature, interviews conducted with representatives from select organizations, and evaluations of yearly or periodic reports. Their research indicates that "market-based reforms" result in the privatization of health services in Latin America.

Based on both qualitative and quantitative research, Ali and Anita (2016) investigated a study on Bangladeshi medical tourism. India Medical Tourism (2009) claims that together with the travel sector, several private corporate hospitals such Apollo Group, Wockhardt, and Fortis help to provide "cost-effective" private medical treatment for patients needing surgery and other kinds of specialist treatment. Low cost of surgery, qualified experienced physicians, quality of nursing care, non-availability of therapy in Bangladesh, and status of medical facilities and treatment in India turned out as the pull factors motivating Bangladeshis to fly to India for medical treatment. Rahman (2016) conducts a qualitative investigation on the impact of globalization on health governance in Bangladesh. His primary objective is to elucidate the detrimental impacts of globalization on the healthcare sector. He claims that private medical institutes and hospitals, both in Bangladesh and worldwide, engage in the purchasing and selling of medical services at exorbitant prices.

There are numerous scholarly works that discuss the privatization of the health sector. The majority of them demonstrate that "market-based reforms" result in the privatization of health services. A few of them emphasized the impact of privatization on various aspects of the health system, including costs, sustainability, efficiency, accessibility, solidarity, quality of care, health status, and freedom of choice. Moreover, a significant amount of research exhibits some degree of overlap. The researchers conducted this study to assess the current state of the privatization of the health sector and the dynamics of upper-class relationships in Madaripur.

3. THEORETICAL RELEVANCY TO THE STUDY

Marx defined class as a collection of individuals who share the means of production, or their livelihood. Landowners-aristocrats, gentry, and slaveholders-dominated pre-industrial cultures. Modern industrial societies value factories, offices, and machines. Modern industrial cultures were dominated by industrialists or capitalists, who owned new manufacturing methods, and the proletariat, who sold their labor to them. Marx also studied social connections in capitalism, where private ownership of the means of production drives economic activity and profit-seeking. Marx also studied the emerging bourgeoisie and proletariat. While the proletariat is the working class, the bourgeoisie owns the means of production. Capitalist capitalists maximize profit by competing with other farmers.

The topic also overlaps with Weber's rational bureaucracy and social stratification research. The rational state bureaucracy has helped abolish discrimination in Madaripur's private and public hospitals. Other post-modernist theorists like David Harvey and Castell helped analyze modern phenomena. David Harvey showed how accumulation and dispossession exploit capital. Castell highlighted how globalization affects modern life.

3.1 Marx's Theory of Social Class and Class Structure

Karl Marx (1818–1883), a revolutionary communist, influenced numerous 20th century communist governments. Few have had as much impact on modern society. In his mid-20s, Marx switched from philosophy to economics and politics. Marx believed that understanding capitalism and other social systems or modes of production required analyzing property ownership, social class, class structures, and changes in those structures. Marx and Engels write in the Communist Manifesto that “the history of all hitherto existing society is the history of class struggles.”

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Class differences and conflicts are crucial to understanding capitalism. Marx defined classes by work and labor relations and property and production relations. In capitalism, economic concerns dominate social connections more than in prior cultures. The clergy, knights, and military leaders of past cultures may have been classes, not just economic classes.

3.2 Max Weber: Nature of State in the age of Modernity

Weber is the most famous classical sociological theorist due to his study and influence. Weber studied sociology, politics, history, language, religion, law, economics, and administration like Marx. History, capitalism, politics, and future society are his topics. Sociology recognizes Weber's state, bureaucratic, and political viewpoints. He thinks political societies rule by force and law. State bureaucracy employs legislation, charismatic dominance uses qualities, and conventional authority uses power.

A state exists when a political society monopolizes force. Weber calls the state "a compulsory association that organizes dominance." Weber believes the state legitimizes all violence. Even if the police and military are its main weapons, state legitimacy does not limit private security force. It monopolizes legitimate physical rule. States rule, so people comply. To maintain its legal monopoly on force, the state handed its leaders organization tools and "expropriated any independent estate functionaries who once possessed these means in their own rights". The state regulates. Weber defines state as law, borders, and power. Weber first claims that the state's force monopoly determines its means, not goals. Weber felt the state was aggressive and violent, contrary to popular belief. Different governing strategies go beyond force. Budget violence for state establishment, not growth. States create laws, police, defend rights, foster culture, and organize armed defense against foreign attack. Weber said the state forbids unauthorized force. Public governance ("bureaucratic authority") and market economy ("bureaucratic management") have these institutions. Bureaucracy limits freedom. Weber believes rational societies need bureaucracy. Bureaucracies control markets and states. Bureaucracies manage resources like businesses. When battle becomes machine war, college bureaucracy fosters research and education. Bureaucracies unite the governed against the governing class to create mass democracies to alleviate socioeconomic disparity. Bureaucracy may be reliable and useful if managed effectively. Bureaucracies dehumanize themselves and empower objective specialists by focusing on calculable administrative duties. Masters of politics may pit amateurs against pros.

3.3 David Harvey: Accumulation by Dispossession

Harvey revived social class and Marxist methodology in social and political discourse by attacking global capitalism, especially neoliberalism. Harvey adds the burgeoning financial sector and capital accumulation geography to Marx's worldview. Market commerce may rule all human activities, claims “neoliberalism”. Since 1970, it has dominated worldwide thought and behavior. In "The New Imperialism and the Condition of Postmodernity," David Harvey explores globalization and neoliberalism's beginnings.

In "A Brief History of Neoliberalism (2005)," he discusses mid-1970s neoliberalism. Harvey says the neoliberalized global political economy supports the few and separates classes through "accumulation by dispossession." Dispossession accumulation is theft and illegal. His newest book, The Enigma of Capital (2010), thoroughly covers the economic crisis. Harvey blames global capitalism for the financial crisis. Lawlessness and amorality characterize capitalism. Harvey argues capitalism depletes resources. Neoliberalism promotes market, privatization, and anti-state welfare. Neoliberalism increased inequality yet lifted some impoverished people out of poverty. Highest social wealth. Workers feel helpless under capitalism's framework, lack of production control, and view of social interactions as physical.

Like Marx, Harvey thinks capitalism produces value through investment, production, and commerce. Until they can produce independently, laborers must sell. Beyond capitalist labor power buys, workers create surplus value. Capitalist civilizations seem free; therefore, individuals must grow quickly to collect. Absolute exploitation may increase with workweek extensions. Capitalists can narrow the socially mandated commercial work time-private production cost gap by increasing 'the productivity of social labor, which becomes the most powerful lever of accumulation' Capitalist class requirements vs. individual ambitions might undermine the system. Harvey says capitalism never has ideal competition beyond market pricing. Capitalism gives governments "that permit the law of value to operate in diverse but ever more effective ways."

3.4 Castells: Globalization

In the present day, the term "globalization" has become a popular topic of discussion. 'Globalization' is now employed to denote the global dissemination and interconnection of technologies, communication, and production, which are interconnected with economic and cultural activities. 'Globalization' is also employed by some to describe the endeavors of the International Monetary Fund (IMF), the World Bank, and other organizations to create a global free market for products and services. The unique force of globalization is a combination of the sheer volume of commerce, interaction, and risk, the complexity and scale of the networks, and the speed of communication and exchange. Additionally, there has been a transition in authority from the nation-state to multinational corporations.

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4. METHODOLOGY

The study aims to examine private health care's determinants and the upper class's interaction with it. Given social and political changes, wealth, neoliberalism, capitalism, and public access, the private sector's origins must be observed. Quantitative approaches are employed in this study. The aims of the analysis are well-suited to this approach. This research specifically observed the 10 private hospitals in Madaripur. The respondents were selected on basis of probability sampling and data collected from 130 respondents: 110 patients, 10 nurses, and 10 hospital authorities. The study utilized both primary and secondary data sources. A comprehensive research questionnaire was designed for primary data collection by using various structured closed-ended and open-ended questionnaires. A face-to face interview was taken to collect the data. Secondary data sources included books, papers, and research studies, as well as articles available in libraries and online. Multiple sections make up the interview schedule. The first section determines patients' age, education, marital status, socioeconomic class, and occupation. The second segment discusses the health sector's privatization and the upper class's role. The section examines and evaluates health care privatization. Before finalization, a small group of respondents similar to those in the final survey pretested the interview schedule. The study evaluated the questionnaire's translation and integrity using pre-testing data. After the pre-test, the questionnaire was revised, corrected, and modified for data collection.

The data was processed and presented in tables and graphs to facilitate data analysis and interpretation after data collection was completed. The interpretation of primary data was conducted with the overall perspective of the research study in mind, and it was compared and corrected as necessary. The objective of data processing and analysis is to provide meaning to the data and present it to the audience, as the collected data does not contain any inherent meaning. The data was initially edited, and it was subsequently coded and tabulated in SPSS and Excel. Editing was implemented to guarantee that the data were precise, consistent with other facts collected, uniformly inputted, and as comprehensive as feasible. After the editing process, the computer received the finalized interview schedule and a tabulation plan for processing. A variety of tables and themes depicted the socio-economic and demographic variables, along with a few other factors.

5. FINDINGS OF THE STUDY

In order to comprehend the correlation between the upper class and privatization, a total of 110 patients, 20 nurses, and hospital administrators were interviewed using a meticulously designed questionnaire. The following findings provide insight into the effects of neoliberal policies, broader social and political changes, capitalism, industrialization, and urbanization on the process of privatization. The questionnaire findings are displayed using frequency and bivariate tables. Statistical associations between variables are assessed by employing several suitable measures of correlation.

5.1 Name of the Hospitals of the Respondents

The following table displays the names of the respondents' hospitals. With regard to hospital names, 23% are from Chowdhury Clinic, 19% are from Nurjahan Selim Niramoy Hospital, 15% from Planet Hospital and Diagnostic Centre, 12% from Asmat Ali Khan Central Hospital Ltd., 9% from Shah Madar Hospital & Diagnostic Centre, and the rest (22%) are from the other five hospitals in the town. The establishment of 40% of the hospital occurred between 2000 and 2020, and the establishment of 20% occurred prior to 2000. After 2020, the remaining 40% of the hospital was established.

Table-1 Name of the Hospital of the respondents and year of establishment of the hospital

Name Of Hospital	*Year of Establishment*	*Number of Respondents*	*Percentage (%)*
Chowdhury Clinic	1985	*30*	23
Nurjahan Selim Niramoy Hospital	1996	*25*	19
Planet Hospital and Diagnostic Center	2022	*20*	15
Asmat Ali Khan Central Hospital Ltd.	2020	*15*	12
Shah Madar Hospital & Diagnostic Centre	2022	*12*	9
K. I. Digital Hospital & Diagnostic Centre	2000	*8*	6
Popular Hospital Madaripur	2019	*6*	5
Islami Bank A R Hawolader Hospital	2014	*5*	4
Prottyasha Private Hospital	2001	*5*	4
Setara General Hospital	2014	*4*	3
Total		**130**	**100**

Source: Field Survey, 2023/2024

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5.2 Demographic Profile of the Respondents

Socio-demographics is a term that encompasses a combination of demographic and social factors that determine the characteristics of a specific group or population. Age, education, marital status, employment, social status, etc. are all considered socio-demographics. The researcher will be able to gain valuable and actionable insights that will help them make more informed business decisions by asking the appropriate demographic questions.

5.2.1 Age of the Respondents

Participants who are above the age of 50 make up the greatest share of the total, accounting for around 37% of the total participants. 20% of the respondents are under the age of twenty, with the majority being children. 18% of the people who participated in the survey are in the age range of twenty to thirty years old, and 14% of them are in the age range of 40-50 years. Only 12% of the participants are under 30-40 years old.

5.2.2 Educational Qualification of the Respondents

There is a significant proportion of the participants, approximately 32%, who have a high degree of education, which is indicative of their higher social standing. Of the 130 people who participated in the survey, 25% of them had not completed their secondary education. 34 persons, or 26% of the total responses, have successfully completed the SSC examination, and 22 individuals, or 17% of the total, have successfully completed the HSC examination.

5.2.3 Occupation and Marital Status

The majority (41% of the participants) reported working in various government, non-government, and service-related sectors, as well as being businessmen. The survey results indicate that a mere 5% of the participants identified themselves as students, while 28% identified as housewives. The bulk of their monthly income is substantial, and in almost all instances, their family members (spouse, offspring, parents) are also working abroad. Among the respondents, 65% are married, 22% are unmarried, and 14% are widowed or divorced.

Table-2 Socio-Demographic Information of the Respondents

Demographic characteristics	*Category*	*Frequency (N)*	*Percentage (%)*
Age	below 20	26	20
	20-30	23	18
	30-40	15	12
	40-50	18	14
	50-above	48	37
	Total	**130**	**100**
Educational qualification	below SSC	32	25
	SSC	34	26
	HSC	22	17
	Honours & Masters	42	32
	Total	**130**	**100**
Occupation	Students	7	5
	Service	14	11
	Business	24	18
	Retired	16	12
	Housewife	37	28
	Others (Children/Older)	32	25
	Total	**130**	**100**
Marital Status	Unmarried	28	22
	Married	84	65
	Widow/Widower/Divorced	18	14
	Total	**130**	**100**
Social Class	Upper	48	37
	Upper Middle	46	35

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Middle	24	18
Lower	12	9
Total	**130**	**100**

Source: Field Survey, 2023/2024

5.2.4 Social Class of the Respondents

The study investigates how people's social class status has a significant impact on privatization and access, which is a key focus of this research. Approximately 37% of the participants are classified as belonging to the high social class, while 35% are categorized as being in the upper middle class. The majority of the patients belong to the high and upper middle socioeconomic strata. The middle class comprises 18% of the population, while the lowest class accounts for barely 9%. The middle class, especially the lower class, frequently turns to private hospitals when they are unable to access critical medical care from government hospitals.

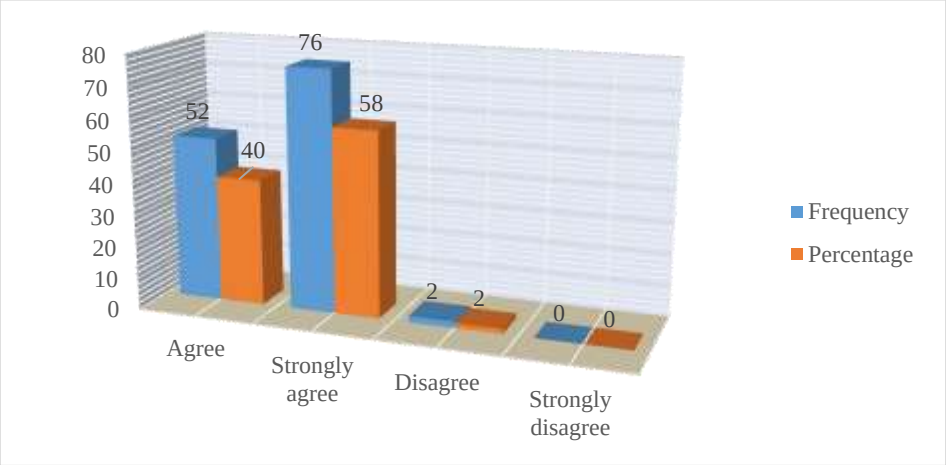
5.3 Causes of Health Sector Privatization

In the 1990s, the number of private clinics in Bangladesh rose. Private hospitals and private medical institutes have taken over healthcare services. Madaripur witnessed the establishment of advanced private hospitals between 2000 and 2020. Prior to this, only two privately owned medical hospitals existed. After 2020, several state-of-the-art private hospitals emerged, including Asmot Ali Khan Central Hospital, Planet Hospital and Diagnostic Center, and Shah Madar Hospital & Diagnostic Centre. These hospitals provide enhanced medical facilities and improved access to healthcare services.

5.3.1 Linkage of Privatization with Wider Social and Political Development

Privatization is linked to individual provision and the establishment of a progressive, secure, and pleasant socioeconomic environment. Around 58% of participants strongly agree, whereas 40% feel that privatization is linked to political and social progress. Only 2% of the participants voiced their dissent about this. Regardless of their destitute condition, specific individuals will inevitably appear.

Figure-1 Social and Political Development and Privatization



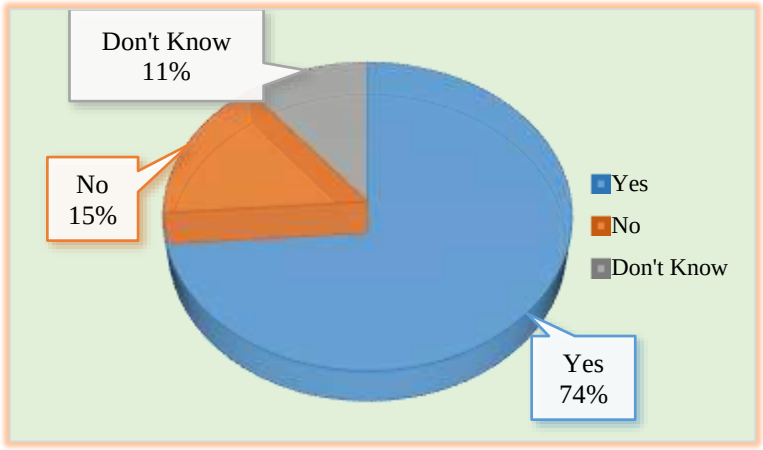
Source: Field Survey, 2023/2024

5.3.2 Modernization and Privatization of Health Care

The process of modernization has led to highly noticeable changes in people's lifestyles. Despite the high cost, people today want better treatment. The study reveals that 74% of respondents agree, 15% disagree, and 11% are unsure about the impact of the modernization process on health care privatization.

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Figure-2 Modernization and Privatization of Health Care

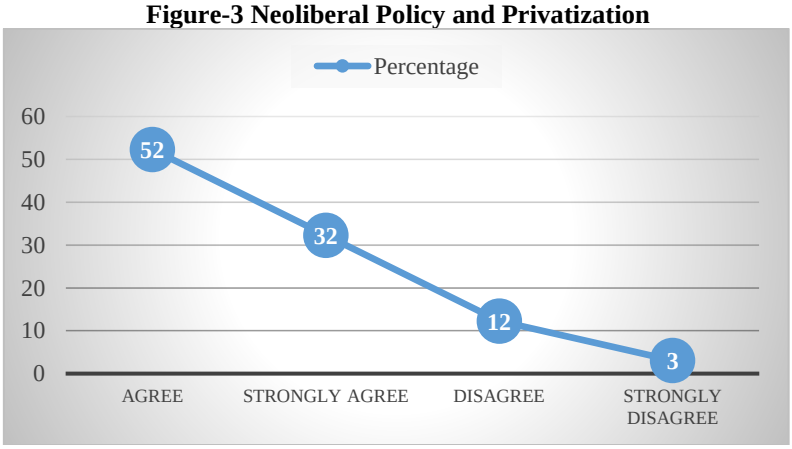


Source: Field Survey, 2023/2024

5.3.3 Neoliberal Policy and Privatization

Within the framework of neoliberal government agendas, the process of privatizing responsibility is associated with three key developments: the reevaluation of the dynamics between the public and private sectors, the promotion of accountable citizenship, and the establishment of a cultural mindset that aligns with these developments. The implementation of neoliberal reforms has resulted in significant transformations in the global healthcare system due to its focus on a free market economy, diminishing the government's involvement in the economy, privatizing public assets, and reducing public spending. With regard to the notion that the state's control over the health sector is diminishing day by day (neoliberal policy), 52% of respondents are in agreement, 32% are in strong agreement, 12% are in disagreement, and 3% are in strong disagreement.

Figure-3 Neoliberal Policy and Privatization



Source: Field Survey, 2023/2024

5.3.4 Urban Growth and Privatization

Madaripur is a fast-growing municipality located approximately 105 kilometers from Dhaka metropolis. Declared a municipality in 1875, Madaripur stands as one of the subcontinent's oldest settlements. According to the Bangladesh Bureau of Statistics (BBS) 2011 population census, Madaripur Municipality has a population of 62,690. Madaripur's urban population increases by 1% each year. Considering that 10% of the floating population, such as farmers and traders, visits the city every day, the current (2020) population is predicted to be around 75,400. The growing unban population makes it difficult for a government hospital to provide adequate treatment. Over time, the number of private hospitals has steadily increased. The chart reveals that 49% of respondents agree, 39% strongly agree, 9% disagree, and 2% strongly disagree that the urban growth process influences health care privatization.

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Figure-4 Urban Growth and Privatization



Source: Field Survey, 2023/2024

5.3.5 Capitalism and Private Health Care

Because of competition, private ownership of the health sector often goes hand in hand with a more market-based, competitive environment. Competition has driven up quality, including access to high-quality care, adequate information, and standardized products and services. The table below reveals that 75% of respondents are aware of the connection between health care privatization and capitalism. The other 6% and 18% of respondents, respectively, answered 'no' and 'don't know' that there is any relationship between health sector privatization and capitalism.

Table-3 Healthcare Privatization Linked to Capitalism

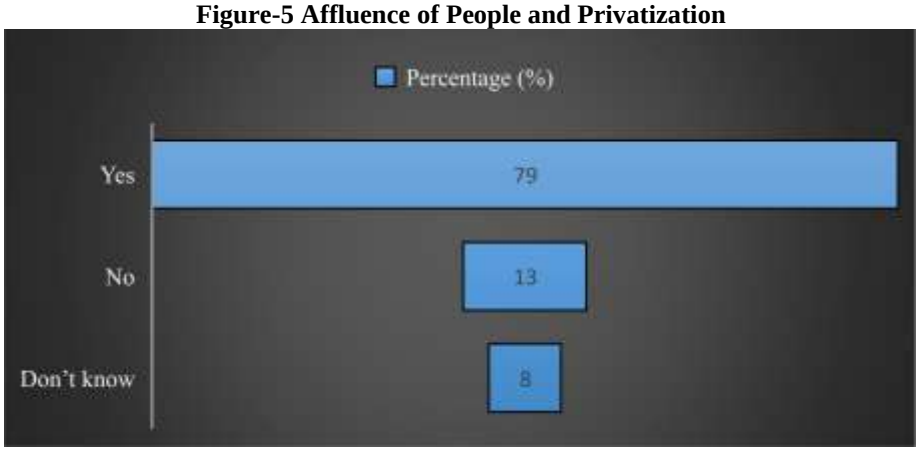
Aspect	*Categorization of responses*	*Frequency (n)*	*Percentage (%)*
Health Care Privatization Linked to Capitalism	Yes	98	75
	No	8	6
	Don't know	24	18
	Total	**130**	**100**

Source: Field Survey, 2023/2024

5.3.6 Affluence of People and New form of Health Care

Affluence is associated with a higher regard for health. It is reasonable to anticipate that affluent individuals will be willing to pay a premium for exclusivity, privacy, and what they consider to be superior quality of care. Medical entrepreneurs will also respond to increased affluence, which will promote private investment in health care. The following chart shows that 79% of respondents say "yes," 13% say "no," and 8% rely on "don't know" that greater affluence places value on health care.

Figure-5 Affluence of People and Privatization



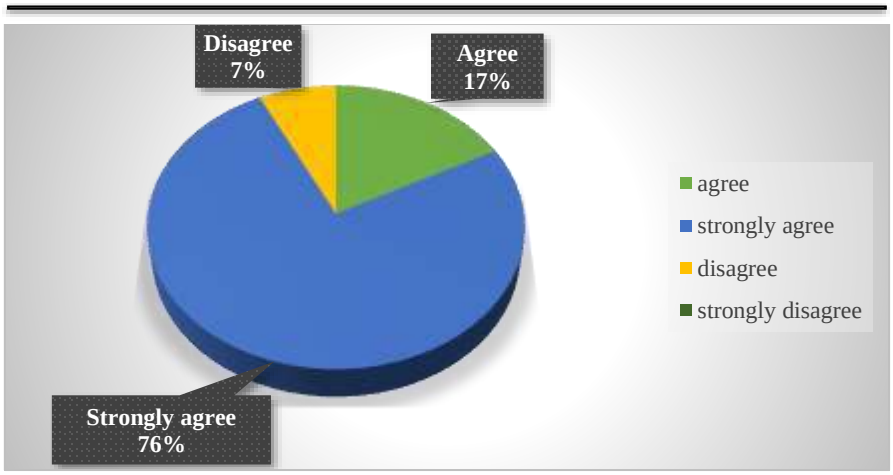
Source: Field Survey, 2023/2024

5.3.7 Quality of Care, Health Package, Advanced Technology, and Overall Performance

The quality of care, various health care packages, utilization of advanced technology, competition, and overall performance of the private sector significantly draw in patients. The following chart shows that 76% of respondents "strongly agree," 17% agree, and 7% disagree that quality, competition, and overall performance influence the private health sector.

Figure-6 Quality of care, Health care package, Competition, and Overall Performance

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Source: Field Survey, 2023/2024

5.3.8 Privatization: A Failure of the Public Sector

The public health sector has several challenges, including overpopulation, inadequate treatment and medical facilities, a lack of skilled and experienced medical professionals, and an increase in corruption. These factors add complexity to health care environments. Approximately 100% of respondents agree that the failures of government hospitals create a demand for private hospitals.

Table-4 Privatization: A Failure of the Public Sector

Category	*Categorization of responses*	*Frequency (N)*	*Percentage (%)*
Overcrowding	Agree	44	34
	Strongly Agree	86	66
	Disagree	0	0
	Strongly Disagree	0	0
	Total	**130**	**100**
Lack of qualified and experienced medical specialists	Agree	52	40
	Strongly Agree	62	48
	Disagree	12	9
	Strongly Disagree	4	3
	Total	**130**	**100**
Non-availability of treatment and medical facility	Agree	39	30
	Strongly Agree	85	65
	Disagree	6	5
	Strongly Disagree	0	0
	Total	**130**	**100**
Waiting Duration	Agree	46	35
	Strongly Agree	73	56
	Disagree	11	9
	Strongly Disagree	0	0
	Total	**130**	**100**
Untidy and Unclean Environment	Agree	34	26
	Strongly Agree	96	74
	Disagree	0	0
	Strongly Disagree	0	0

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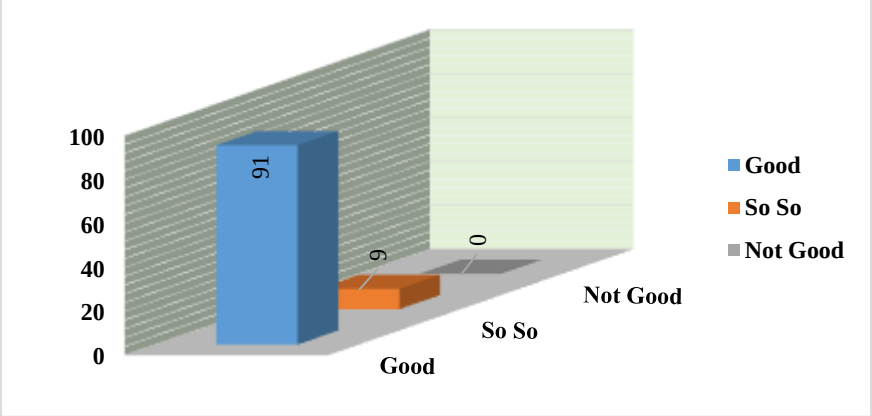
	Total	**130**	**100**
Corruption	Agree	55	42
	Strongly Agree	65	50
	Disagree	10	8
	Strongly Disagree	0	0
	Total	**130**	**100**

Source: Field Survey, 2023/2024

5.3.9 Treatment and People's Access to the Private Health Sector

The number of private clinics in Bangladesh has increased since the 1990s. Private hospitals and private medical colleges have taken over the provision of health care. Since 2000, Madaripur has also had state-of-the-art private hospitals, such as Chowdhury Clinic, Niramoy Hospital, Planet, Asmot Ali Khan Hospital, Shah Madar, and other renowned hospitals. Almost 100% of patients prefer to receive treatment from a private hospital. 91% respond that the level of treatment in a private hospital in Madaripur is good, and the other 9% think that it is satisfactory but not up to the mark. 82% of doctors behave friendly, and 18% say they are consumerist and capitalist. About 100% of respondents reply that more expense prevails in the private medical sector.

Figure-7 Level of Treatment in Private Hospital

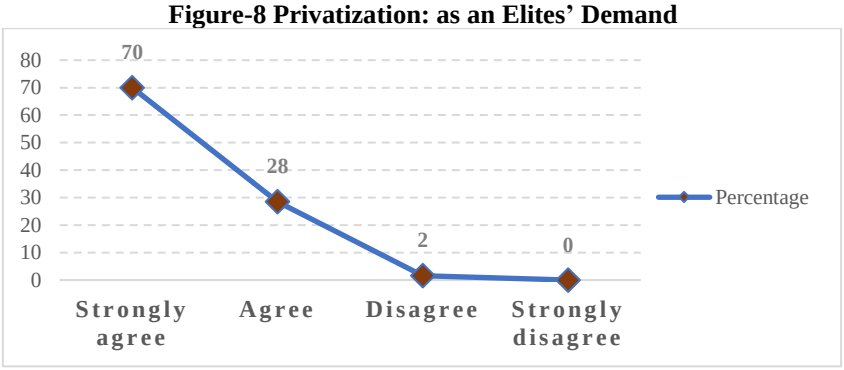


Source: Field Survey, 2023/2024

5.3.10 Private Health Care: As a Response to Elites' Demand

The majority (72%) of those seeking healthcare at private clinics belong to the upper and upper middle class. Additionally, 22% of the participants, consisting of 18% from the middle class and 4% from the lower class, also utilize these clinics. The table indicates that 70% of the respondents hold a strong agreement, while 28% agree, that the privatization of the health sector is driven by the demand of the elite. Merely 2% hold a dissenting opinion on this matter.

Figure-8 Privatization: as an Elites' Demand

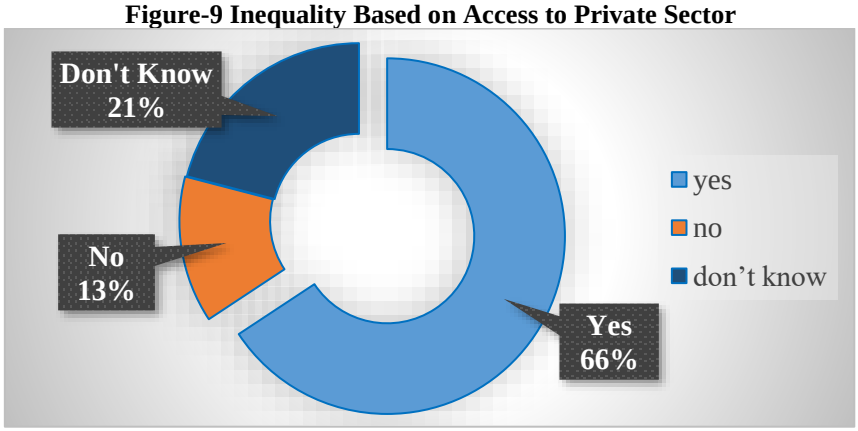


Source: Field Survey, 2023/2024

Approximately 100% of nurses and hospital authorities reported that there are no special opportunities available for the poorer section of the population. The private sector does not offer any publicly financed services. Access to the private sector also reflects the existing inequality among the population. The following figure indicates that 66% of respondents agree, 13% disagree, and 21% are unsure about whether access to private health care reflects the existing inequality among people.

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Figure-9 Inequality Based on Access to Private Sector



Source: Field Survey, 2023/2024

6. DISCUSSION OF THE STUDY

Privatization is the process of transferring ownership and control of assets that are controlled by the government to individuals or private companies. In practically all developed nations, there has been significant focus on the privatization of health care services over the past twenty years. The condition of it is determined by several socioeconomic factors. Hence, it is imperative to examine the relationship between privatization and the socio-economic status of the upper class, taking into account elements such as modernization, urbanization, globalization, and capitalism that have a significant impact.

6.1 Privatization: A Response to Wider Social and Political Development

Privatization might be associated with broader political or social advancements. This entrenched process is highly influenced by broader changes in public policy making, including the transition from state planning to market competition, individual accountability, and consumer choice. Individuals currently enjoy enhanced accessibility to services, income, social and political engagement, civil liberties, and human rights, all of which impact their ability to partake in privatization procedures. Approximately 58% of respondents strongly agree, whereas 40% feel that privatization is correlated with social and political development.

Increased wealth also leads to a desire for private healthcare services that are not provided by the government. There is a correlation between this development and the increased importance placed on health. We may anticipate that those with high wealth will be willing to cover the costs associated with obtaining exclusive access, maintaining privacy, and receiving what they consider to be a superior level of treatment. Increased wealth will also prompt a reaction from medical entrepreneurs, promoting private investment in healthcare. Approximately 75% of participants confirm that the private healthcare industry is stimulated by the wealth of individuals.

6.2 Privatization: As a Consequence of Modernization

Ronald Inglehart (2000) posits that modernization is indicative of vast cultural transformation and the persistence of unique cultural traditions. This change is linked to the emergence of rational, tolerant, trusting, and participatory modernization, which is characterized by a departure from absolute norms and values. It influences all aspects and establishes socio-cultural development indicators. It is examining novel methods for the development and modification of social institutions. About 74% of the respondents believe that modernization boosts private healthcare expansion. The emergence of distinct social classes has been facilitated by the expansion of opportunities for various occupations as a result of modernization. Individuals are currently establishing their own initiatives in order to attain independence. Our society is being modernized by media and communication, while trade has a variable impact on health. Despite the exorbitant cost, the majority of respondents concur that individuals are now seeking superior treatment.

6.3 Neoliberal Policy and Privatization

Neoliberalism's major impact on economic transformations is the privatization of health services. It affects healthcare systems worldwide by emphasizing the free market over the right to health. Neoliberal policies have privatized health care and made it a commodity. This transition of care from the welfare state to the free market impedes low-income people's access to healthcare. Most of the respondents agreed that state power over the private sector is eroding. As it disproportionately affects the poorest and restricts their access to basic rights like healthcare, this neoliberal change may be a kind of structural violence. With regard to the notion that the state's control over the health sector is diminishing day by day (neoliberal policy), 52% of the respondents are in agreement, and 32% are in strong agreement. When government hospitals cannot provide significant treatment, the middle class, especially the lower class, turns to private hospitals.

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6.4 Capitalism, Private Property, and Upper Class

Modern industrial societies value factories, offices, and machines. Industrialists or capitalists possessed new means of production, while the working class, or proletariat, sold their labor to them. Marx sometimes supported the proletariat. Contemporary health care reflects society's class structure. The growth of medical facilities, the financial infiltration of large businesses, and the emergence of the "medical-industrial complex" demonstrate monopoly capital. Political and economic interests influence health policy recommendations. State health care intervention preserves capitalism and the private sector. Most respondents (75%), felt capitalism impacts health sector privatization. Approximately 100% of respondents indicated that these sectors incur higher costs. Private health care was created for aristocratic reasons. 70% of the respondents strongly agree, and 28% believe elite demand drove health sector privatization. Doctors sometimes want too much money. 18% claimed doctors are consumerist and capitalist, although others believe they're pleasant.

6.5 Urbanization, Privatization, and Social Class

Private sector dominance distinguishes urban health systems. Private services are more developed in cities than rural regions, especially in Madaripur, due to higher average incomes and income variation that creates market niches. 49% agree, and 39% strongly agree that the health care privatization is influenced by the urban growth process. Rural public health posts and clinics commonly offer free or low-cost services, while urban one's charge for services. These hospitals serve the wealthy with high-tech equipment and possibilities. In Madaripur, about 37% of respondents are high class, and 35% are upper middle class. The urban poor without cash may be unable to access modern hospitals, clinics, and well-trained professionals in a highly monetized urban economy. Poor people skip or buy less medication to save money. In theory, several governments provide subsidies for impoverished people to buy private sector medicines or treatment. These subsidies are scarce in our country. According to most hospital administrators, there are no publicly supported private sector special opportunities.

6.6 Public Failures Encourage Privatization

Bangladeshi health has several challenges. Due to overcrowding, a shortage of trained doctors, and corruption, many individuals suffer with medical facility availability, accessibility, and cost. The Bangladeshi Central Government spends considerably on health care but doesn't meet domestic needs. Corruption in public health is widespread. Due to poor supply chain management, procurement received substandard healthcare supplies. Hospital supplies often broke rules. Poor medical equipment and facility maintenance. About 100% of the respondents said that public sector failure drove them to private clinics.

Public health facility shortages of labour, drugs, and other supplies, client harassment and maltreatment, and unlawful payments are caused by weak public sector governance. Thus, inadequate health-care governance has led to high prices, poor service, and poor outcomes for the poor. The government hospital of Madaripur has a shortage of doctors, nurses, and medical technicians, corruption, accountability in public fund use, inadequate health care quality, limited treatment availability, an uncomfortable hospital environment, and delayed and trustworthy public sector medical intervention. This agony sends many, especially the rich, to private hospitals. Public hospital staff recommend private clinics for better care. Doctors rarely listen, explain health conditions, or discuss diagnosis and therapy. Therefore, patients and families are always confused about doctors' roles and treatments. Doctors and technicians deliberately ruin public hospital equipment for years to boost private clinic revenue and incentives. Public hospital patients cannot expect simple pathology or radiology. Respondents feel private clinic patients overpay. Poor people lack basic primary and secondary healthcare, creating healthcare disparities by socioeconomic status and region. Rural people face public health discrimination. Poor and middle-class individuals often receive inadequate healthcare. However, wealthy people only use modern private hospitals in crises. About 72% of private clinic patients in Madaripur are upper and upper-middle class; some travel abroad for better care. Higher-class desire for health sector privatization is fueled by 32% of patients being graduates, 18% being businessmen, and 23% are working in government, non-government, and other service sectors.

7. CONCLUSION AND RECOMMENDATIONS

In summary, there is a correlation between the socioeconomic status of individuals and the privatization of the health sector. The study's results indicate that social class is a significant factor in determining access to private health care. The concept of privatization has been broadly defined in this investigation. The hypothesis of privatization in the health sector and among the higher class is corroborated by the study's results. The primary focus of the investigation is on the factors that contribute to privatization and their correlation with socioeconomic status, particularly the upper class. Globalization, modernization, urbanization, capitalism, and the development of neoliberal policies are among the factors that contribute to the privatization of the health sector. The study was conducted using a structured questionnaire, particularly a matrix questionnaire, to ascertain the causes, costs, and behaviors of physicians in the private health sector. It also investigates the unequal distribution of access to it according to social status.

The results provide compelling evidence that the privatization of the heath sector is significantly influenced by the upper class. The demand for sophisticated facilities among the elite has led to the establishment of private health care. In the public hospital of Madaripur, it is impossible for a patient to anticipate a straightforward pathological or radiological examination. For years, doctors and technicians have purposefully maintained medical equipment in public hospitals in a state of disrepair in order to boost the

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business of private clinics and earn commissions. Ultimately, patients are compelled to seek treatment at private clinics. Nevertheless, its exorbitant price impedes individuals' accessibility. In addition, capitalism has resulted in the establishment of private ownership and class categorization within society, while neoliberal policies have reduced government oversight of public expenditures. Privatization has also been exacerbated by market competition, individual responsibility, consumer choice, and lifestyle change. Private services are more developed in cities, particularly in Madaripur, due to the higher average income levels of urban populations and the income diversity that establishes market niches.

Recommendations

There are several causes behind the health sector being privatized. Thus, the following are some recommendations to prevent the further privatization process and also to enhance the current situation:

i. It is quite impossible for a patient to anticipate a straightforward pathological or radiological examination in the government hospital of Madaripur because for years, doctors and technicians have purposefully maintained medical equipment in a state of disrepair in order to boost the business of private clinics and earn commissions. The government should look into this matter and take appropriate action against it.
ii. The government hospital of Madaripur has a shortage of doctors, nurses, and medical technicians. Individuals also asserted that finding skilled doctors is a daily challenge. As a result, patients are not receiving quality treatment, leading them to seek better care at private hospitals. Therefore, the government should recruit more experts (doctors, nurses, and technicians) to solve this problem.
iii. Doctors rarely listen, explain health conditions, or discuss diagnosis and treatment. Therefore, patients and families are always confused regarding doctors' roles and treatments. Poor health care quality, restricted treatment availability, uncomfortable hospital environments, and delayed and trustworthy medical intervention are widespread. Many, especially the wealthy, seek treatment at private institutions due to this misery. Therefore, these difficulties must be addressed properly.
iv. Poor supply chain management, medical equipment, and facility maintenance purchases gave government hospitals subpar healthcare supplies. Nearly all respondents said public sector failings pushed them to private clinics. Thus, medical equipment supply and maintenance should be handled by trustworthy individuals.
v. Capitalism has resulted in private ownership and class categorization within society. Respondents feel private clinic patients overpay. Private hospital owners prioritize profit over patient care. Thus, authorities have to take adequate measures as soon as possible to keep health services within the limits of all types of people.
vi. The demand for private health care is a direct result of the elite's desire to avoid the inconvenience of waiting in an unclean and unhygienic environment for their doctors. They expect proper treatment facilities in a clean and organized environment quickly, despite the high expense. However, its high cost discourages enrollment in other courses. Thus, the government must address this issue.
vii. Finally, it is imperative that all stakeholders in society who are involved in health care collaborate to establish a healthy nation. To that end, it is critical to conduct thorough oversight, hold open forums, implement necessary changes, and guarantee the well-being of doctors, nurses, and support staffs.

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A REVIEW ARTICLE ON THE *VISHAGHANA* PROPERTIES OF *MANJISHTHA* (*Rubia Cordifolia*) IN AYURVEDIC AND CONTEMPORARY SCIENCE

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ABSTRACT

Visha, or poison, comes from plants, animals, and minerals. We require antidotes or antitoxic medications to offset the harmful effects that poisons have on our bodies. In our treatises, Charak Samhita, Sushruta Samhita, and Ashtanga Hridyam, Vishaghana medicines are listed as a means of arresting the poisonous effects. The antipoisonous properties of Manjishtha will be covered in this article. The availability of both single and multiple manjishtha formulations suggests that it is useful in treating various poisonings. Comprehensive research is conducted on all facets of Manjishtha, with a particular focus on detoxification. All logical references have been chosen, and requirements-based collection, correlation, and explanation have been completed. Manjishtha's medicinal uses are highlighted based on indications and detoxification; these are particularly well-described in Ayurvedic and contemporary texts.

The idea is that it will eventuallydenaturize any poison by dissecting the pathophysiology of toxicity. If the illness falls under any category related to toxicity, it might be helpful. Many toxicological illnesses are treatable and preventableNowadays, it can be widelyapplied for both curative and preventive purposes to ensure a life free from toxicological agents and disease, based on the concept of Vishaghana qualities of Manjishtha.

KEYWORDS: *Manjishtha, Vishaghana, effects*

INTRODUCTION

Ayurvedic drugs with several pharmacological actions, such as antidiabetic, antipyretic, anti-inflammatory, analgesic, anti-histaminic, anti-microbial, immunomodulator, anti-herpes, cosmetic conditions, menstrual disorders, and cardio-gastro-hepatoprotective properties, are most commonly found in *Rubia cordifolia*, also known as *Manjishtha*[1]. *Manjishtha* is categorized within the *Vishaghana Mahakashaya Dravya* group, as stated in the *Shadvirechanshatashreeya* chapter of the *Charak Samhita's Sutra Sthana*. Detoxification and *Vishaghana* share the same practical meaning. By neutralizing and denatured toxins and aiding in their escape from the body at the cellular level, *Vishaghana Mahakashaya Dravya* may have antitoxic properties. The medications found in *Vishaghana Mahakashaya* are effective in treating all forms of poisoning, including *Dushi* and *Gara Visha*, as well as bites from snakes, scorpions, rats, stings, and chronic cumulative biochemical toxicity. In Ayurveda, *Agada* is a multi herbo-mineral drug preparation which indicates in various types of poisoning.

COMMON DESCRIPTION & SCIENTIFIC CLASSIFICATION OF RUBIA CORDIFOLIA[2]

It is a perennial climber that can reach a maximum length of 12 meters on a thorny stem. The leaves are very varied, with whorls of four to six, ovate lanceolate, 5-7 nerved, 2 to 10 cm long, and 2 to 5 cm broad. Flowers are little, white or greenish yellow, aromatic, and tiny. When fruit reaches maturity, it is tiny, glabrous, has one or two seeds, and is either dark purple or blackish. The shrub has fruit and flowers from August to October. The roots of perennial plants display a long, cylindrical shape and a rusty brown color.

Kingdom	Class	Subclass	Order	Family	Genus	Species
Plantae	Dicotyledons	Sympetalae	Rubiales	Rubiaceae	Rubia	cordifolia

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Table 1: Categorizes *Manjishtha* in different Ayurvedic texts based on General and *Vishaghana* classifications

S.N.	*Ayurvedic* Literature	General Classification	*Vishaghana* Classification
1.	*Charak samhita*[3,4,5]	*Varnya, Jwarhar*	+
2.	*Sushruta samhita*[6,7]	*Priyangavadi, Ambashthadi gana*	-
3.	*Ashtang Samgraha*[8,9,10]	*Priyangavadi*	+
4.	*B.P. Nighantu*[11]	*Haritkyadi varga*	+
5.	*Raj Nighantu*[12]	*Pippalyadi varga*	+
6.	*Kaideva Nighantu*[13]	*Aushadhi varga*	+
7.	*Dhanvantari Nighantu*[14]	*Guduchyadi varga*	+
8.	*Priya Nighantu*[15]	*Pippalyadi varga*	+

Table 2: *Ayurvedic* pharmacodynamics of *Manjishtha*
(Textbook of Dravyaguna P.V.Sharma,Vol.2, P;800)

S.N.	Pharmacodynamics	Explanation
1.	*Rasa* (Taste)	*Tikta* (Bitter), *Kashaya* (Astringent), *Madhura* (sweet)
2.	*Guna* (Properties)	*Guru* (Heavy), *Ruksha* (dry)
3.	*Veerya* (Potency)	*Ushna* (Hot)
4.	*Vipaka* (Post digestive effect)	*Katu* (Pungent)
5.	*Dosha prabhava*	*Kapha-pitta shamaka*
6.	Pharmacological Action	*Varnya, Balya, Vishaghana, Raktaprasadaka, Rasayana*

Chemical Composition of Rubia cordifolia

The phytochemical components of Rubia cordifolia that are most well-known are anthraquinones and naphthohydroquinones[16]. Rubiadin[17], Rubicordone A18, Rubiasins A–C19, Rubiatriol[20], and two pentacyclic triterpenoid compounds, Rubicoumaric acid and Rubifolic acid[21], are the main components of Rubia cordifolia. Additional chemical components include furomollugin[22], garancin, mollugin, mangistin, and alizarin.

Table 3: *Agada* Preparation of *Manjishtha* and Therapeutic *Vishaghana Yoga*

S.N.	Mention	Name	Indication	References
1.	*Charak*	*Rajniadi Churna*	*Visha*	C.S.Chi.23/50
		Mahagandhahasti	*Visha*	C.S.Chi.23/77-94
		Pipplyadi Pishthi	*Visha*	C.S.Chi.23/185
		Manjishthadi Pana	*Mandali Sarpa visha*	C.S.Chi.23/196
2.	*Sushruta*	*Mahagada*	*Vishavegahar*	S.S.K.5/61-62
		Rishabhagada	*Sarpakeeta visha*	S.S.K.5/68-72
		Drakshadi agada	*Sarpavisha*	S.S.K.5/76-77
		Ksharagada	*Visha*	S.S.K.6/3-7
		Kalyanak Sarpi	*Visha*	S.S.K.6/8-11
		Snukakshiradi lehya	*Mushak damsha*	S.S.K.7/22
3.	*Vagbhatt*	*Manjishthadi churna*	*Sarpa visha*	A.H.U.36/59
		Kashmaryadi pana	*Sarpa visha*	A.H.U.36/65
		Pathyadi lepa	*Vraschika visha*	A.H.U.37/38
		Champakadi agad	*Luta visha*	A.H.U.37/71
		Agardhumadi lepa	*Mushaka visha*	A.H.U.38/18
		Suryodaya agad	*Visha*	A.S.U.40/57
		Priyangavadi agad	*Visha*	A.S.U.40/59
		Mushkadi yoga	*Visha*	A.S.U.40/81
		Ajeya ghrita	*Visha*	A.S.U.40/98
		Mahagada	*Visha*	A.S.U.42/61
		Rishabh Agad	*Visha*	A.S.U.42/62
		Kshara agad	*Visha*	A.S.U.47/38
4.	*Bhavprakash*	*Jatyadi Taila*	*Vishaj Vrana*	B.P.M.47/90-95
		Mritypasachhedi ghrita	*Visha*	B.P.M.67/82-87

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		Rajniyugmadi lepa	*Luta Visha*	B.P.M.67/89
5.	*Yogratnakar*	*Jatyadi Taila*	*Vishaj Vrana*	Y.R. sadyovrana 46-50
		Grahadhumadi yoga	*Aakhu Visha*	Y.R. visha 111
		Rajniyugmadi lepa	*Luta Visha*	Y.R. visha 138
		Mrityuchhardi ghrita	*Visha*	Y.R. visha164-169

MATERIALS AND METHODS

All *Ayurvedic* and contemporary references regarding *Vishaghana* are collected from *Ayurvedic* fundamental books and various textbooks, research article, international journals. *Agada's* descriptions were gathered from several old Ayurvedic books.

LITERARY REVIEW

The words "*Agada*" and "*Tantra*" are the two words that make up the sentence. The word *Agada* originates from *Gada*. The names *Gada (*illness*) and Visha (*poison*)* have distinct meanings. *Agada* can also be referred to as drugs. This is the reason *Agada* is an anti-poisoning medication. *Gada* signifies two different things*: Roga (*illness*) and Visha (*poison*)*. Medication is another name for *Agada*. *Agada* can also be referred to as drugs. This is the reason *Agada* is an anti-poisoning medication. In the Ayurvedic Samhitas (Compendium), a variety of single herbs, polyherbal formulations, and herbo-mineral formulations are listed as anti-poisonous. Antitoxic drugs, also referred to as "*Vishaghana*" drugs, neutralize dangerous substances. Some *Vishaghana* medications work because of their inherent qualities (*Dravya Prabhava*), some because of their characteristics (*Guna Prabhava*), and still others because of their dual qualities (*Dravya Guna Prabhava*). These antitoxic herbs and preparations, or *Vishaghana Dravya* and *Vishaghana Yogas* and *Agadas,* are used to treat a variety of diseases and poisonings. These Ayurvedic kinds of anti-toxic remedies contain unique combinations for specific dosha vitiation in a range of poisoning situations. *Raktashodhaka* (blood purifying), *Tridoshaghana* (creates bodily humour balance), *Hridya* (protects the heart), and *Ojovardhaka* (rejuvenates) are the results of most of these antitoxic therapies.

Certain Detoxification-Related Pharmacological Actions of Rubia Cordifolia

1. Rubia cordifolia has been shown to exhibit antioxidant action against radiation-induced toxicity[24] and lead nitrate[23].
2. Rubia cordifolia's alizarin biomarker is in charge of its antigenotoxic properties[25].
3. The anti-inflammatory effects of Rubia cordifolia in rats with carrageenan paw edema. When the plant was given 10 and 20 milliliters per kilogram of the water extracts, it exhibited notable anti-inflammatory properties comparable to phenylbutazone (100 mg/kg [26].
4. Anti-adipogenic activity of 2-carbomethoxy-2, 3-epoxy-3-prenyl-1, 4-naphthoquinone (CMEP-NQ)isolated from the roots of *Rubia cordifolia* L., its effects on cell viability, apoptosis, and adipogenesis in 3T3-L1 preadipocytes were investigated[27].
5. Alcoholic extracts of Rubia cordifolia whole plant show enhance immune-modulating activity (Cell mediated and humoral) due to alkaloids, flavonoids, tannins and phenols of plant[28].
6. Rubia cordifolia's alcoholic root extract offers defense against lipid peroxidation, hemopoietic damage, and genotoxicity brought on by radiation[29].
7. Purpurin (anthroquinone derivatives) constituents of Rubia cordifolia show antigenotoxic activity[30].
8. It has been demonstrated that R. cordifolia exerts cell/neuroprotective effects via avoiding glutathione depletion, raising GSH levels by promoting the production of c-glutamylcysteine ligase, lowering oxidant levels through direct scavenging, and lowering iNOS expression[31].
9. R. cordifolia extracts were also assessed using the 1, 1-diphenyl-2-picryl-hydrazyl and TBARs Thiobarbituric acid reactive substances technique, respectively, for their antioxidant and lipid peroxidation inhibitory activity[32].
10. Lipid peroxidation in the kidney and liver tissues was also considerably reduced in *Rubia cordifolia* extract treated animals[33].
11. The hepato-protective activity of an aqueous-methanol extract of *Rubia cordifolia* (Rubiaceae) was investigated against acetaminophen and CCl4 induced hepatic damage[34].
12. R. *cordifolia* also inhibited lipoxygenase enzyme pathway and production of cumene hydroperoxides as anti-inflammatory reaction[35],[36]

USES OF *MANJISHTHA* IN POISONING

Manjishtha: Rubia cordifolia shows antioxidant activity against lead nitrate and radiation induced toxicity.[37] Purpurin constituents of Rubia cordifolia shows antigenotoxic activity.According to *Bhavaprakash*, *Manjishtha* is able to bind itself *Amavisha* and *Garavisha.*

Contemporary uses

Antimicrobial, antioxidant & astringent

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Action against poison in *Vishaghana Mahakashya*

In *Mahakashaya*, *Manjishtha* is primarily chosen for its blood-purifying qualities.
It purifies *Rakta Dhatu* since it contains *Madhur*, *Kashaya*, *and Tikta Rasa.*

DISCUSSION

As we have seen in above literature that *Manjishtha* have been used as a prominent content in many *Agada* (antitoxic) preparations. These *Agada* are mainly used for different types of toxicity as such *Sarpa*, *Luta*, *Vrishchika* and *Mushaka* etc. by our great sages of Ayurveda. According to recent studies, *Manjishtha* also has immunomodulatory, hepatoprotective, nephroprotective, antigenotoxic, and antioxidant properties. The idea of *Manjishtha's Vishaghana Guna* is strengthened by these studies. As we've seen, *Manjishtha* shields the kidney, liver, and many body cells against various radiation and chemical exposures.

CONCLUSION

As per the above discussion, we conclude that *Manjishtha* is a *Vishaghana* (Anti-toxic) drug useful in different type of toxicity. It will help with biological toxicity, cumulative toxicity, acute and chronic substance-acquired toxicity, metabolic toxicity, etc. and diseases due to toxicity. *Manjishtha* can be easily used in today's era for preventive as well as curative disease and make the life free from toxicological agents.

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EFFICACY OF WORLD HEALTH ORGANIZATION PHYSICAL ACTIVITY GUIDELINES THROUGH INDIANIZED PHYSICAL EXERCISE PROGRAMMES ON SELECTED FITNESS VARIABLES AMONG URBAN YOUTH

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ABSTRACT
The purpose of the study was to find out the efficacy of world health organization physical activity guidelines through Indianized physical exercise programmes on selected fitness variables among urban youth. To achieve the purpose forty urban youth were selected from Chennai metro city and they were divided into two groups each consists twenty subjects Group one Indianized exercise, group two control group. Pre and Post-test were conducted prior to and after the experimental training. The experimental period was restricted to Six day in a week for Six Weeks. The collected data were analyzed statistically with the dependent't' test. The analysis revealed that the world health organization physical activity guidelines through Indianized physical exercise programmes significantly improved the selected fitness variables among urban youth.
KEYWORDS: *WHO, Physical Activity Guidelines, Indianized Physical Exercise, Fitness Variables, and Urban Youth.*

INTRODUCTION

The World Health Organization was created in 1948 to coordinate health affairs within the United Nations system. Its initial priorities were malaria, tuberculosis, venereal disease, and other communicable diseases, plus women and children's health, nutrition, and sanitation. From the start, it worked with member countries to identify and address public health issues, support health research, and issue guidelines. It also classified diseases. In addition to governments, WHO coordinated with other UN agencies, donors, non-governmental organizations (NGOs), and the private sector.

Physical activity guidelines of the World Health Organization

In 2018 WHO launched a new Global Action Plan on Physical Activity 2018-2030 which outlines four policy action areas and 20 specific policy recommendations and actions for the Member States, international partners, and WHO, to increase physical activity worldwide. The global action plan calls for countries, cities, and communities to adopt a 'whole-of-system' response involving all sectors and stakeholders taking action at global, regional, and local levels to provide safe and supportive environments and more opportunities to help people increase their levels of physical activity.

In 2018, the World Health Assembly agreed on a global target to reduce physical inactivity by 15% by 2030 and align with the Sustainable Development Goals. The commitments made by world leaders to develop ambitious national SDG responses provide an opportunity to refocus and renew efforts at promoting physical activity.

The WHO toolkit ACTIVE launched in 2019 provides more specific technical guidance on how to start and implement the 20 policy recommendations outlined in the global action plan. The global action plan and ACTIVE propose policy options that can be adapted and tailored to local culture and contexts to help increase levels of physical activity globally, these include:

The development and implementation of national guidelines for physical activity for all age groups;

- Establishing national coordinating mechanisms involving all relevant government departments and key non-government stakeholders to develop and implement coherent and sustainable policy and actions plans;
- Implementing community-wide communication campaigns to raise awareness and knowledge of the multiple health, economic and social benefits of being physically active;
- Invest in new technologies, innovation, and research to develop cost-effective approaches to increasing physical activity, particularly in low resource contexts;
- Ensure regular surveillance and monitoring of physical activity and policy implementation.

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Indianized Exercises

Yoga	Silambam
Dhands	Kalaipayattu
Baithke	Malkhamph
Gada	Calisthenic exercises
Jori	Folk dances

Health-related physical fitness is the ability to perform moderate to vigorous levels of physical activity without undue fatigue and the capability of maintaining such ability throughout life.

Health-related physical fitness means that they are healthy and organic systems of the body.

Muscular Strength

Muscular strength is the ability of a muscle group to develop maximum contractile force against a resistance in a single contraction.

Flexibility

Flexibility is the ability to perform a joint action through a range of motion. For example, touching toes while sitting or standing without bending knees.

Cardiovascular Endurance

The ability to perform muscular work at the submaximal level by moderate contractions for a long time is known as cardiovascular endurance. The direct power or maximum oxygen uptake capacity while indirectly it is measured with the help of long-duration activities, for example, long-distance running, cycling, or swimming.

Statement of the Problem

The purpose of the study was to find out the efficacy of world health organization physical activity guidelines through Indianized physical exercise programmes on selected fitness variables among urban youth.

Hypotheses

1. It was hypothesized that there would be a significant improvement on muscular strength due to Indianized physical exercise among urban youth.
2. It was hypothesized that there would be a significant improvement on flexibility due to Indianized physical exercise among urban youth.
3. It was hypothesized that there would be a significant improvement on cardiovascular endurance due to Indianized physical exercise among urban youth.

DELIMITATION

1. Only forty urban youth were selected from Chennai metro city.
2. The age group of subjects was 18 to 25 years.
3. Only health-related fitness was dependent variables.
4. Only Indianized physical exercise was an independent variable.

Limitation

1. The socio-economic background, lifestyle, and habits of the subjects were not considered for this study.
2. The subject's body types were not taken into consideration.
3. The external factor like atmosphere, the status of the subjects, cultural influences, heredity and environment of the subjects was not considered for this study.

REVIEW OF THE RELATED LITERATURE

Dinakaraprasad (2019) effect of Indian indigenous exercise programme with and without nutritional counseling on selected health-related physical fitness and physiological variables among obese engineering college students conducted a study was the investigator used a double sampling procedure.1000 students were screened for body mass index(BMI) based on their body weight and height from various affiliated colleges of Anna University in Chennai, Tamilnadu BMI score of 30.0 to 34.9 will be identified separately. One hundred twenty (120) students were selected randomly as subjects for the study. Their age ranged from 18 to 23 years. They were assigned randomly into three groups. The selected subjects were divided into experimental group I, experimental group II and control group. The selected creation variables namely cardiorespiratory endurance, flexibility, body composition, muscular strength, muscular endurance, breath-holding time,

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resting pulse rate, vital capacity, mean article blood pressure anaerobic power. Experimental group I was exposed to an Indian indigenous exercise programme with nutritional counseling, experimental group II was exposed to an Indian indigenous exercise programme without nutritional counseling and the control group was not exposed to any experimental training other than their regular activities. Experimental groups the respective treatments for 12 weeks. The pre and post-test scores were subjects to statistical analysis using analysis of covariance(ANCOVA) to find out the significance among mean the difference whenever the 'F' ratio for adjusted test find to be significant, Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test the hypotheses.

METHODOLOGY

The purpose of the study was to find out the efficacy of world health organization physical activity guidelines through Indianized physical exercise programmes on selected fitness variables among urban youth. To achieve the purpose fourty urban youth were selected from Chennai metro city and they were divided into two groups each consists twenty subjects Group one Indianized exercise, group two control group. Pre and Post-test were conducted prior to and after the experimental training the experimental period was restricted to Six day in a week for Six Weeks. The above experimental training were suitably executed by Indianized physical exercises on Monday – calisthenic exercise and folk dance, Tuesday – yoga, Wednesday dhands and gada, Thursday - baithke, yoga and folk dance Friday and Saturday.

SELECTION OF VARIABLES

Independent variable

1. Indianized exercises based on WHO Physical Exercise guideline

Dependent variable

Health-related fitness

1. Muscular strength
2. Cardiovascular endurance
3. Flexibility

STATISTICAL TOOLS

The collected data were analysed statistically with the dependent 't' test .through Meta test calculator online.

RESULTS ON DISCUSSIONS

TABLE – I
RESULTS AND DISCUSSION OF FITNESS VARIABLES

		SDE	't'- Value	P Value
Muscular Sterength	EG	0.2911	25.0776*	0
	CG	0.965	1.1045	0.5288
Flexibility	EG	0.3394	12.5254*	0
	CG	0.609	0.7389	0.92
Cardio-Vascular Endurance	EG	11.6501	11.6501*	0
	CG	1.453	1.453	0.2925

*Significant: Table Value requires **1.681**

The results presented in table I indicates that obtained 't' value (25.0776) for muscular strength between pre and post-test of experimental group was greater than the required table value 1.681 Hence the results proved that there was a significant improvement of muscular strength among urban youth due to the experimental training.

The results presented in table I indicates that obtained 't' value (1.1045) for muscular strength between pre and post-test of control group was lesser than the required table value 1.681. Hence the results proved that no significant improvement of muscular strength among urban youth in the control group.

The results presented in table I indicates that obtained 't' value (12.5254) for flexibility between pre and post-test of experimental group was greater than the required table value 1.681 Hence the results proved that there was a significant improvement of flexibility among urban youth due to the experimental training.

The results presented in table I indicates that obtained 't' value (0.7389) for flexibility between pre and post-test of control group was lesser than the required table value 1.681. Hence the results proved that no significant improvement of flexibility among urban youth in the control group.

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The results presented in table I indicates that obtained 't' value (11.6501) for cardiovascular endurance between pre and post-test of experimental group was greater than the required table value 1.681 Hence the results proved that there was a significant improvement of cardiovascular endurance among urban youth due to the experimental training.

The results presented in table I indicates that obtained 't' value (1.453) for cardiovascular endurance between pre and post-test of control group was lesser than the required table value 1.681. Hence the results proved that no significant improvement of cardiovascular endurance among urban youth in the control group.

CONCLUSIONS

1. There was a significant improvement on muscular strength due to Indianized physical exercise among urban youth.
2. There was a significant improvement on flexibility due to Indianized physical exercise among urban youth.
3. There was a significant improvement on cardiovascular endurance due to Indianized physical exercise among urban youth.

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WEBSITES

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ANALYSIS ON SVEDAVAHA SROTUS WSR TO ITS MULA

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ABSTRACT

Srotus(body channels) is considered as an important entity of the body and is responsible for the Vahana(transferring) of Dosha, Dhatu etc. Full body is considered as Srotomaya(made of Srotus). Among the types of Srotus, Svedavaha Srotus(which does Sveda Vahana) is given prime importance. The root of Svedavaha Srotus is considered as Meda(Adipose tissue) and Lomakupa(Hair follicle). Abnormality to Svedavaha Srotus leads to accumulation of Sweat bad smell, itching, even may cause excessive sweating. When Ushnamsha of the body increases it leads to secretion of Dravarupi Mala from Tvak which is usually by the burning of Fat tissue which leads to formation of carbon dioxide and water, water formed henceforth is secreted as sweat, hence Meda is considered as the Mulasthana(Udbhava Sthana) of Svedavaha Srotus. Once the formation of Sveda is finished, its Vahana has to take place out of the body since it is a Mala and for elimination the organ used is Lomakupa and hence it is considered as Mula for Svedavaha Srotus. By considering Udbhava Sthana of Sveda, Meda is considered as the Mula and by considering the Bahiniskramana Anga of Sveda, Lomakupa is considered as the Mula for Svedavaha Srotus. Similarly Srotomula of each and every Srotus should be analyzed along with its Mula and there is a need of further study in the field of Srotus and Srotomula.

KEY WORDS – *Srotus, Svedavaha, Meda, Lomakupa.*

INTRODUCTION

Dosha, Dhatu, Mala is considered as the basis of the body.[1] Other than these three entities *Srotus* is an another important entity which is the basis for the body. *Purusha* is called as *Srotomaya* because *Srotus* are present all over the body and they are essential in the increase and decrease of the *Dosha*, even it carries *Dhatu* and leads to the formation of the *Dhatu*.[2] *Srotus* are the hollow channels except *Sira* and *Dhamani*, which originating from root space and spreads in the body and carries specific entities.[3] *Srotus* are the channels through edwhich the various body entities flow.[4] Srotus are the channels of circulation that carry *Dhatu* undergoing transformation to their destination.[5] Regarding the number/types of *Srotus* it is mentioned that number of substances having definite shape are there in this universe that much types of *Srotus* are there in the body. Some opine it is numerable and others opine it is innumerable. [6]

These channels have the colour similar to that of the *Dhatu* that they carry; they are tubular, either large or small in size and either straight or reticular in shape. The reasons for the vitiation of the *Srotus* their pathological features and treatment for the same is mentioned. Increase or obstruction in the flow of the contents of the channels, appearance of nodules in the channels and diversion in the flow of the contents to improper channels are the general signs of the vitiation of the *Srotus*.[7]

There is various numbers of types of *Srotus* mentioned by different authors. Among the list is given of *Srotus* prime importance is given to *Svedavahavaha Srotus*. The word meaning of *Svedavaha Srotus* signifies that, the channel through which *Sveda* flows can be considered as the *Svedavaha Srotus*. The root of this Srotus is considered as the *Meda(Adipose tissue)* and *Lomakupa* (Hair follicle). Abnormality to *Svedavaha Srotus* leads to accumulation of Sweat bad smell, itching, even may cause excessive sweating.[8] *Svedavaha Srotus* gets vitiated by wasting, excessive physical exercise, excessive exposure to sunlight. The characteristic manifestation of the vitiation of *Svedavaha Srotus* is too restricted, aggravated sweat secretion which leads to bad smell and itching. [9]

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Sveda controls body temperature by way of expelling excess water and toxins, cools the body, moistens skin & hair and carries excess fat from the body and purification of the blood. Maintaining moisture (*Kledavidhruti*) is the main function. Proper functioning of hair follicles (*Kesha Vidhruti* or *Roma-Avlambana*) is added. Moistness of skin (*Kleda* or *Kledana*) and softness of skin (*Twak Saukumarya*) are the main functions of *Sveda*. It keeps the skin and hair moist, delicate, smooth & maintain the integrity of skin. It helps to maintain water balance in the body. It helps in maintenance of body temperature It prevents different *Vatika* disorders It also excretes the various kind of toxins from the body.

Sweat is a clear, watery and salty liquid produced by the sweat glands present in the skin. Sweat is mainly produced in noticeable amounts under the arm, feet and palms. When it comes in contact with the bacteria on skin, it can cause a smell. Regular bathing and use of antiperspirants or deodorant can help to control odor. In extreme conditions or during heavy exercise, large quantities of sweat is produced. It proves to be a great method of thermoregulation as long as humidity in surrounding atmosphere is relatively low. Stimulation of anterior hypothalamus-preoptic area is responsible for the action of sweating. The impulses from this area are transmitted in the autonomic pathways to the cord and then through the sympathetic outflow to the skin and elsewhere in the body. The volume of sweat produced and expelled every day is generally about 100ml/day and may vary from person to person. The water loss through sweat may increase upto 1-2 L/hour in case of exercise or extremely hot weather.

Though the eccrine glands are supplied by symphathetic fibres, yet adrenaline (epinephrine) has got little or no action on them. The apocrine however responds to both adrenergic and cholinergic stimuli. Pilocarpine, which stimulates the parasympathetic fibers, increases the flow of sweat and atropine which paralyses the parasympathetic endings, abolishes sweating. Different types of sweating: Insensible sweating: which occurs even in cold climate amounts to 600 – 800 ml daily. Thermal sweating: This occurs in hot environmental temperature, the threshold being 28°C for men and 31˚C for women. As the environmental temperature rises sweating increases. It is to be emphasized that when the ambient temperature is higher than body temperature sweating is the only method of keeping the body temperature normal. Psychic sweating:- Emotional sweating: In emotional condition, sweating occurs chiefly in the palms, soles, and axilla and upto some extent it is also present at head, neck and elsewhere in the body. In muscular exercise: The sweating i.e. both thermal and mental is reduced by cold, which at the same time also reduces, cutaneous circulation. It is also reduced by dehydration which be the result of deprivation of fluids intake or due to the process of sweating itself. Hot & spicy food intake: Eating of spicy food stimulates sweating (gustatory sweating), because pain in nerve endings in the mouth are stimulated. Hence reflect sweating in forehead neck and face. [10]

DISCUSSION

Eccrine glands: These are the common sweat glands distributed all over the body, especially over the thick skin. The eccrine sweat gland is basically of tubular structure which at beginning is in the deeper part of dermis and is highly coiled. The rest of the gland courses through the dermisepidermis- open to the exterior. Sweat forms by coiled portion. These are functional throughout the life. These are present largely over the back and chest regions. When synthesized the sweat is isotonic, but while moving towards the exterior, some sodium ions are reabsorbed. In case of severe sweating, this reabsorption is more intense due to the action of aldosterone. The thermoregulation via sweating occurs through the eccrine glands innervated by sympathetic cholinergic fibres. The eccrine sweat is basically made up of water and sodium chloride (NACl). It may also contain mixture of many other chemicals from the interstitial fluid as well. The amount of sodium and cholride in the eccrine sweat is considered to be less, 60 mmol/L and 70 mmol/L respectively. Apocrine glands: These glands are located deep in subcutaneous layer in limited areas like axilla (armpit), pubic region, around the nipple of breast, scalp. The activity of apocrine glands increases with the onset of puberty and declines at old age. This process shows that these glands have got some relationship with reproductive physiology. The secretion from apocrine glands is odorless but bacterial decomposition makes it odorous, secretion show cyclic changes in females with menstrual cycle. These glands are structurally similar to eccrine glands, but are larger. Their coiled region lies within the subcutaneous tissue rather than the dermis. In contrast to the eccrine glands, apocrine glands produce vicious, lipid rich sweat comprising of proteins, sugars and ammonia. The third type of glands i.e. apoeccrine glands have been described by Sato et. al in 1987. These are intermediate in size and develop from both eccrine and apocrine glands. These are mainly located in the axillary part and don't play a significant role in thermoregulation. Though the eccrine glands are supplied by symphathetic fibres, yet adrenaline (epinephrine) has got little or no action on them. The apocrine however responds to both adrenergic and cholinergic stimuli. Pilocarpine, which stimulates the parasympathetic fibers, increases the flow of sweat and atropine which paralyses the parasympathetic endings, abolishes sweating.

When *Ushnamsha of the body increases it leads to secretion of Dravarupi Mala* from *Tvak which is* usually by the burning of Fat tissue which leads to formation of carbon dioxide and water, water formed henceforth is secreted as sweat. Once the formation of *Sveda* is finished, its *Vahana* has to take place out of the body since it is a *Mala* and for elimination the organ used is *Lomakupa*.[11]

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CONCLUSION

Dosha, *Dhatu*, *Mala* is considered as the basis of the body. Proper functioning of *Doshas*, proper nourishment of *Dhatus* and proper elimination of Mala from the body is important for being *Swastha*. Among the *Mala Sveda* is an important entity. Among the types of *Srotus*, *Svedavaha Srotus*(which does *Sveda Vahana*) is given prime importance. The root of *Svedavaha Srotus* is considered as *Meda*(Adipose tissue) and *Lomakupa*(Hair follicle). Abnormality to *Svedavaha Srotus* leads to accumulation of Sweat bad smell, itching, even may cause excessive sweating. When *Ushnamsha of the body increases it leads to secretion of Dravarupi Mala from Tvak which is* usually by the burning of Fat tissue which leads to formation of carbon dioxide and water, water formed henceforth is secreted as sweat, hence *Meda* is considered as the *Mulasthana*(*Udbhava Sthana*) of *Svedavaha Srotus*. Once the formation of *Sveda* is finished, its *Vahana* has to take place out of the body since it is a *Mala* and for elimination the organ used is *Lomakupa* and hence it is considered as *Mula* for *Svedavaha Srotus*. By considering *Udbhava Sthana* of *Sveda*, *Meda* is considered as the *Mula* and by considering the *Bahiniskramana Anga* of *Sveda Lomakupa* is considered as the *Mula* for *Svedavaha Srotus*. Similarly *Srotomula* of each and every *Srotus* should be analyzed along with its *Mula* and there is a need of further study in the field of *Srotus* and *Srotomula*.

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EFFECT OF CULTURALLY RESPONSIVE PRACTISES ON STUDENT'S MOTIVATION TO LEARNING

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ABSTRACT

In recent years, extensive research has unveiled the pervasive undervaluation of the academic potential of students of color by public school teachers, especially in developed countries where there is an increase in immigrants. However, this misjudgment has resulted in low expectations and a failure to recognize the value of cultural differences as assets to learning students from these minority cultures have become demotivated and uninterested in learning. Some research and literature have reported that connecting academic knowledge to students' lived experiences makes learning more meaningful, interesting, and effective. Factors like motivation to learn in students can bring about several personal meanings and attitudes to classroom activities, which can arouse their interest and energies differently. The interest theory which is seen as the most well-known antecedent of motivation served as a guide to this study. Thus, the situational interest is sparked by environmental stimuli, providing strong motivation for learning and resulting in heightened attention and improved information processing. This inclination towards specific topics, tasks, or activities is influenced by the appealing nature of the stimuli, such as novelty, significance, or attractiveness. It has been extensively researched in the context of text comprehension. Thus, this study recommends there is the need for the Implementation of a culturally relevant curriculum that comprises the use of materials and images in the classroom to reflect a diverse range of perspectives. Contextualizing issues within race, class, ethnicity, and gender is crucial in creating an inclusive learning environment that will enhance the students' motivation to learn.

KEYWORDS: *Culturally Responsive Practices, Motivation, Students, Schools and Learning.*

INTRODUCTION

According to a 2012 report by the Organization for Economic Cooperation and Development (OECD), high-performing education systems are classified as those that combine equity and quality as well as "give all children opportunities for good quality education". In recent years, extensive research has unveiled the pervasive undervaluation of the academic potential of students of color by public school teachers especially in developed countries where there is an increase in immigrants (School of Education, American University, 2019). However, this misjudgment has resulted in low expectations and a failure to recognize the value of cultural differences as assets to learning. Furthermore, students from these minority cultures have become demotivated and uninterested in learning. In response, educators especially in the United States of America have developed asset-based pedagogies that integrate students' cultural identities and lived experiences into the classroom, thereby enhancing the effectiveness of instruction (Will & Najarro, 2022). These approaches encompass a range of terms, including culturally responsive teaching, culturally sustaining pedagogy, and culturally relevant pedagogy. As learning is very crucial in enabling students' academic performance and achievement (Will & Najarro, 2022), thus, it becomes imperative to examine the effect of culturally responsive practices in teaching as a factor that can enhance students' interest and motivation in learning. Culturally responsive teaching can be defined as a process of using student's customs, experiences, characteristics, and perspectives as a tool to enhance teaching and learning (Davy, 2016). This teaching strategy was inspired by earlier anthropological research that identified a cultural mismatch in language and verbal engagement patterns between students from culturally diverse backgrounds and their white middle-class teachers (Johnson, 2014). It's the kind of teaching that helps students of color see themselves and their communities as belonging in schools and other academic spaces, leading to more engagement and success (Akinsola & Isunueo, 2024).

Culturally responsive teaching is an instructional approach that recognizes and values the diverse cultural backgrounds and experiences of students from diverse cultures and backgrounds. It is grounded in the principles of cultural sensitivity, inclusive pedagogy, and student empowerment. By acknowledging and celebrating students' differences, this approach aims to create an inclusive learning environment.

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According to Will & Najarro (2022), culturally relevant pedagogy, which was created in the 1990s by Gloria Ladson-Billings, is the source of culturally responsive education. Ladson-Billings sought to emphasize Black children's assets, their families, and their communities to refute the widely held notion that they were flawed and dysfunctional. She researched the strategies used by effective Black student instructors to accomplish this. Ladson-Billings observed teachers over a two-year period who were commended as exceptional by Black parents and principals. Even though they used various instructional strategies, they all upheld high standards for their pupils and continuously promoted academic success.

Furthermore in 2000, Geneva Gay re-introduced this concept, highlighting that connecting academic knowledge to students' lived experiences makes learning more meaningful, interesting, and effective (Will & Najarro, 2022),. According to online research from the American University's School of Education (2019), findings states that there has been a turning point in the rise in diversity in public schools. Racial and ethnic minorities make up the majority of students in the US public school system for the first time in history. Since then, there has been a steady rise in the variety of classrooms across the country. Nevertheless, the curricula taught in those classrooms diverge, which causes several students to feel disengaged, detached, and uninterested in the learning process emotions that can have serious, lifelong consequences (School of Education, American University, 2019). However, many educators struggle to effectively navigate cultural differences and provide an equal learning opportunity for all students. While culturally responsive practices (CRP) have been proposed to create fair learning environments, there has been limited evaluation of their efficacy (Bottiani, Larson, Bradshaw, Debnam & Bischoff, 2017).

The framework of culturally responsive education practices is closely linked to motivational theory, as these practices take into account the values and perspectives of students, creating a positive attitude towards learning and fostering intrinsic motivation. Research has shown that intrinsic motivation predicts persistence and performance in various areas, including the workplace, academics, and health behaviors (Cerasoli et al. 2014; Grant & Berry 2011; Judge et al. 2001; Ng et al. 2012; Papaioannou et al. 2006; Vallerand 2007; van Egmond et al. 2017). In addition, promoting inclusion by allowing student groups to express their concerns, expectations, and experiences can increase connectivity among students and the teacher. Treating all students with equity can be achieved through collaborative learning approaches, cooperative learning, focus groups, and multidimensional sharing. Equity in education is essential to ensure that students from diverse backgrounds have equal opportunities to attain post-secondary education credentials, such as university degrees, providing them with the capacity to succeed in the labor market and achieve their aspirations as contributing members of society (OECD, 2018).

Interest Theory of Motivation and Culturally Responsive Practices

Student motivation has been defined as a desire or the willingness to continuously engage in learning classroom activities (Schunk, Pintrich & Meece, 2014). Therefore, the term "motivation" describes the state of being motivated to act or the movement that propels someone's activity. However, students who lack motivation will not participate in any learning activities and will not feel inspired or motivated to acquire a new activity. According to Seifert & Sutton (2012), motivation to learn in students can bring about several personal meanings and attitudes to classroom activities, which can arouse their interest and energies in different possible ways. Student's variations in prior knowledge, ability, developmental preparedness, and motivational differences are a significant source of diversity in classrooms. Furthermore, students' motivations are particularly significant when it comes to studying in the classroom because attendance alone does not always indicate a genuine want to learn. It simply indicates that pupils live in a society where going to school is expected of young people. Therefore, it is only obligatory that teachers ensure that children from minority groups are motivated to learn since modern education is required, and they cannot take this role lightly. Schools and teachers have the responsibility of locating teaching strategies and approaches to make students want to complete the tasks that they are required to complete (Seifert & Sutton, 2012).

The importance of motivation in learning has long been acknowledged by educational researchers, who have examined motivation from a variety of approaches. The research they conducted has resulted in a strong base of motivation theories. The conventional behaviorism perspective, which held that rewards and punishments are the foundation of motivation, was represented in early theories of motivation while other ideas on motivation examined the needs and drives of student's learning. In the past 30 years, researchers have focused their studies on social cognitive approaches, this approach has been the main method used by scholars to examine motivation and it concentrates on how individuals' beliefs and environmental elements influence their motivation (Park, 2017). As a way of examining the motivation of minority student's learning through culturally responsive practices, the interest theory of motivation served as a guide to this paper. Interest which originates from the Latin word 'interesse' was viewed by Dewey (1913) as an engagement and absorption of the self with an objective subject matter. Krapp (2002) defined interest as a relational concept that builds a connection between a person and an object. The object of interest could be very diverse and can be topics, people, abstract ideas, environment, tangible things,

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tasks, events as well as activities like sports, etc. (Hidi & Renniger, 2006). Furthermore, Hidi (2006) states interest in an individual is seen to be a unique motivational concept that creates a linkage between the objective appearance and the subjective representation of an object that triggers actions with the object of interest. Thus, interest is mostly seen to be the most well-known antecedent of motivation. Some inherent characteristics are associated with being in a state of interest (Krapp, 2002). According to some scholars (Berlyne, 1960; Donnellan et al., 2022; Peterson & Hidi, 2019; Csikszentmihalyi, 2000; Hidi & Renninger, 2006). Interest-driven activities can be started and maintained without the aid of outside rewards or incentives. Interest can be distinguished from related constructs of curiosity such as when engaging with the object of interest, pleasant tension, optimal arousal, and happy emotions which are commonly linked to the emotional component of interest. Furthermore, the epistemic inclination to seek knowledge about the item of interest is a manifestation of the cognitive component (Hidi, 1990). The attribution of personal significance to the object makes the value component apparent in the relationship between the object and the self (Schiefele, 1991). Theorists of interest have differentiated interest into two types individual (personal) and situational which could either be long-lasting interest or short-term situational interest. The concept of individual interest reflects a deep motivation towards a specific domain that aligns with a temporally stable personality trait. It is crucial in education to cultivate subject-specific and vocational interests for lifelong learning (Hoff et al., 2018). Situational interest is sparked by environmental stimuli, providing strong motivation for learning and resulting in heightened attention and improved information processing (Hidi, 2006). This inclination towards specific topics, tasks, or activities is influenced by the appealing nature of the stimuli, such as novelty, significance, or attractiveness. It has been extensively researched in the context of text comprehension (Schraw et al., 2001).

Effect of Motivation on Students' Learning and Performance

i. It's critical to understand students' motivation for learning. When a learner becomes aware of the need and becomes motivated to learn, learning occurs most effectively. It is by incentive that this occurs. Motivation encourages students to focus, think critically, and learn efficiently. Motivation improves learning performance. As learning is an active process, participation is necessary. It affects learning speed, information retention, and learning motivation.
ii. A learner's motivation accelerates the rate at which they work toward a goal. Motivation in education is a function of the goal's high and low points. A student who lacks motivation learns very little and finds it tough since they don't think they need to. As a result, motivation gives a student the drive and effort they require to finish the assignment. It puts the student in the right mindset for learning. It focuses a person's attention and energy on the task at hand or the information they need to acquire. A student's motivation impacts whether they will approach a task even one that is challenging with a positive or negative attitude.
iii. Motivation plays a critical role in academic learning and achievement from childhood to adolescence. Motivating students to learn is a top priority in any training setting. One of the main responsibilities of teaching is to ensure that motivation is incorporated into every lesson presentation. Motivation should begin at the lesson's introduction to maintain students' interest and to draw attention to the material that will be covered. It should also continue throughout the entire lesson presentation.
iv. The learning activities' incentive allows the student to focus on his or her work and subsequently feel satisfied with it. To support students in focusing on the lessons they need to learn, ongoing motivation is required. Someone who is motivated will radiate contentment in some way. This aids in the student's personal growth.
v. Motivation guides students' actions toward specific objectives. It establishes the precise objectives that students work toward, which influences the decisions that students make. For instance, choosing between taking a science or art class, going to a school football game during the week, or finishing an assignment that is due the following day.
vi. The commencement and perseverance of learning activities are enhanced by motivation as it lengthens the amount of time students spend on tasks and has a significant impact on their learning and performance.
vii. Cognitive processing is improved by motivation in student, it influences what and how knowledge is digested because motivated students are more likely to focus and make an effort to.

CONCLUSION

Culturally responsive practices have become necessary especially in schools in the United States as a result of an increase in the enrollment of children from diverse backgrounds and cultures. According to Gay (2000 & 2002), culturally responsive practices by schools should comprise essential components of teaching that can enhance interest and motivation to learn especially in students from diverse backgrounds and color. Thus, this study proffers the following recommendations to enhance culturally responsive practices and minority students' learning.

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RECOMMENDATIONS

Thus, this paper recommends.

- An in-depth understanding of cultural diversity is essential. Educators must grasp the cultural values, traditions, and societal contributions of various racial and ethnic groups, integrating this knowledge into their teaching
- Implementation of culturally relevant curricula. They should ensure that the materials and images used in the classroom reflect a diverse range of perspectives. Contextualizing issues within race, class, ethnicity, and gender is crucial in creating an inclusive learning environment.
- High expectations for all students. Teachers should help students achieve academic success while still validating their cultural identities.
- Teachers' appreciation and understanding of different communication styles. By recognizing and modifying their interactions based on these styles, teachers can create a more inclusive learning environment. For instance, many communities of color have a participatory style of communication, and teachers need to be aware of this to avoid misunderstandings and encourage student engagement.
- Furthermore, the utilization of multicultural instructional examples. This can significantly enhance the learning experience by connecting new knowledge to students' prior cultural experiences and backgrounds. In addition, teachers can make the learning process more relatable and meaningful for their students.

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UNDERSTANDING STEM CELLS: PRINCIPLES AND ADVANCES IN REGENERATIVE THERAPY

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INTRODUCTION

Stem cell biology is a dynamic and rapidly evolving field that explores the remarkable properties and potential of stem cells. These unique cells stand out for their incredible ability to differentiate into various specialized cell types and their capacity to self-renew, essentially making them biological building blocks with almost limitless possibilities.

The promise of stem cell research is immense, particularly in the realm of regenerative medicine. This exciting area of study is paving the way for groundbreaking treatments that could one day address a multitude of diseases and injuries. Whether it's regenerating damaged tissues, curing degenerative conditions, or even reversing certain effects of aging, stem cells are at the forefront of medical innovation.

In this article, we will dive into the core principles of stem cell biology. We'll examine the different types of stem cells, from embryonic stem cells to adult stem cells, and explore their unique characteristics. We'll also look at the current and potential applications of these cells in medicine, highlighting how they are being used to treat or potentially cure various health conditions. Finally, we'll consider the future of stem cell research, discussing the exciting possibilities and challenges that lie ahead in this transformative field.

What Are Stem Cells?

Stem cells are a special type of cell with an extraordinary ability: they can turn into different kinds of specialized cells and make copies of themselves over time. This means they play a crucial role in growth, development, and healing throughout our lives.

There are several types of stem cells

1.Embryonic Stem Cells (ESCs): These are derived from early-stage embryos and can develop into almost any cell type in the body. Their versatility makes them incredibly valuable for research and therapeutic purposes.
2.Adult Stem Cells: Found in various tissues like bone marrow and skin, these cells are more specialized than ESCs but still have the remarkable ability to differentiate into a few specific cell types that are related to their tissue of origin.
3.Induced Pluripotent Stem Cells (iPSCs): These are adult cells that have been reprogrammed back into a pluripotent state, meaning they can develop into nearly any cell type, similar to ESCs. iPSCs are created by introducing specific genetic factors into adult cells, such as skin cells. They offer a promising and ethically preferable alternative to ESCs for studying diseases, testing new drugs, and advancing personalized medicine.

Here are some of the exciting ways stem cells are used today

Disease Modeling: By creating cell lines from iPSCs that are specific to a patient's condition, researchers can better understand the mechanisms of various diseases and develop more targeted treatments.

Drug Screening: Stem cells are used to test new drugs for their effectiveness and safety, reducing the need for animal testing and speeding up the development of new therapies.

Genetic Correction: Tools like CRISPR-Cas9 allow scientists to edit genes in stem cells to correct genetic mutations. These corrected cells can then be grown into the required cell types for transplantation, potentially offering cures for genetic disorders.
Despite these advances, the use of stem cells, especially ESCs, comes with ethical concerns. The process of obtaining ESCs involves the destruction of embryos, which raises significant moral and ethical questions. iPSCs, while offering a valuable alternative, also bring their own set of ethical and regulatory challenges, particularly regarding genetic modifications and long-term safety.

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Looking ahead, metabolic syndrome-a cluster of conditions like obesity, high blood pressure, and insulin resistance-is a major global health concern with serious implications for well-being. By increasing awareness, promoting healthy lifestyles, and applying evidence-based strategies, we can combat metabolic syndrome and work toward a healthier future for all.

Challenges and Future Directions

As stem cell research progresses, several key challenges and exciting future directions are shaping the field. Here's a better look at these areas:

1.Enhancing Genetic Modification Techniques: One of the major hurdles in stem cell therapy is ensuring that genetic modifications are both safe and precise. Techniques like CRISPR-Cas9 have revolutionized the ability to edit genes, but there's still a need to refine these tools. Scientists are working on improving the accuracy of gene editing to minimize off-target effects and unintended consequences. The goal is to make genetic modifications more reliable and safer for therapeutic applications.

2.Creating Complex Tissue Structures: Another exciting frontier is the development of complex tissue structures using stem cells combined with biomaterials. Scientists are exploring ways to grow intricate tissue types, such as those found in organs, that can be used for transplantation. This involves creating scaffolds and biomaterials that support the growth and organization of stem cells into functional tissues. Successfully achieving this could transform how we approach organ transplants and tissue repair, potentially leading to the ability to grow replacement organs or advanced tissue constructs for damaged areas.

3.Personalizing Stem Cell Therapies: The future of stem cell therapy lies in its ability to be tailored to individual patients. By analyzing a patient's genetic and molecular profile, researchers can design personalized therapies that are more effective and have fewer side effects. This personalized approach could improve outcomes and ensure that treatments are aligned with the unique characteristics of each patient's condition.

As we navigate these challenges and opportunities, the field of stem cell biology continues to evolve rapidly. With advancements in technology and a deeper understanding of cellular mechanisms, the potential to revolutionize medicine is within reach. However, addressing these challenges will require ongoing research, collaboration, and thoughtful consideration of ethical implications to ensure that these groundbreaking therapies are safe, effective, and accessible for all.

CONCLUSION

Stem cell biology is an exciting and fast-moving field with the potential to fundamentally change the landscape of medicine. By tapping into the unique abilities of stem cells—such as their capacity to transform into various cell types and their self-renewal capabilities—scientists are crafting innovative treatments that could address numerous diseases and injuries.

The progress we've made is impressive, with researchers developing therapies that could one day revolutionize how we approach conditions ranging from degenerative diseases to complex injuries. Yet, as we continue to push the boundaries of what's possible, we must also navigate ethical and technical challenges. Ensuring that these therapies are safe, effective, and ethically sound is crucial.

Looking ahead, stem cell-based treatments are on the verge of becoming a fundamental part of regenerative medicine. This shift promises not only to enhance the way we treat illnesses but also to improve overall health outcomes and quality of life for many people. As we advance, the potential for stem cells to make a significant impact on healthcare becomes increasingly clear, offering hope for a future where groundbreaking treatments are within reach for everyone.

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COMPARATIVE ANALYSIS OF SOIL LANDSCAPES AND INSECT FAUNA IN BIOCENOTIC CHANGES OF KARAKALPAKSTAN

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ABSTRACT
The article considers a comparative analysis of soil landscapes and insect fauna in biocenotic changes of Karakalpakstan. The article also notes that many places have turned into a desert due to the drying up of the Aral Sea, where drying of vegetation due to salinization has led to an increase in the number of harmful insects. Insect pests cause serious harm to plants mainly at the larval stages, and beetles and worms of adult insects cause serious damage by gnawing out the leaves of plants.
KEY WORDS: *Factors, Climate, Salinization, Drying Out, Insects, Flora, Fauna*

INTRODUCTION

Global ecological changes in the environment lead to the emergence of negative situations in all living organisms, which are considered biotic factors, in turn, this has a serious impact on human life.

The drying up of the Aral Sea is considered one of the ecosystem violations in the world. It is known that today the negative conditions of environmental quality in the South Aral Sea region are rapidly increasing on a global scale, and the importance of solving these problems is increasing. In the conditions of Karakalpakstan, modern environmental problems of biocenotic changes in the environment are complex, diverse and territorially different from other places in the Republic of Uzbekistan.

As a result of the drying up of the Aral Sea, serious changes occurred in many places. In the first years of the drying up of the sea, climate changes were observed in places 100 km away from the water, i.e. the air temperature was hot in summer, cold in winter, low humidity (low annual precipitation), and a reduction in the duration of the vegetation period appeared in biotic factors [1, 2].

Among such changes, the presence of dust storms in the air was highlighted due to greater salinization of the environment on the Ustyurt Plain and the Akpetkoy archipelago in the conditions of Karakalpakstan, which is considered the site of the research, and as a result, negative processes in general biotic factors were observed.

MATERIALS AND METHODS OF RESEARCH

The materials required for the research work were studied and compared in the conditions of Karakalpakstan during 2019-2024, i.e. more attention was paid to the soil landscape and insect fauna of the dried bottom of the Aral Sea, the Ustyurt plain and the Akpetkey archipelago, a list of plant flora was also compiled and insects were collected from them.

In this case, the population ecology of insects, the mechanism of evolutionary adaptation and adaptation to the terrain, based on the laws of existence of the community of biocenoses, the level of monitoring and dominance were determined. Also, in laboratory conditions, the species composition of the insect collection was studied based on general entomological, ecological, microbiological, physiological [2], biological, systematic analysis, faunistic, bioecological and phase methods [3].

Samples were collected from the upper, middle and lower layers of the soil according to the soil landscape. All data were obtained using Biostat, Origin 6.1 [Microsoft USA] and G.F. But this was done by statistical processing [2].

RESEARCH RESULTS

In the conditions of Karakalpakstan, studies were conducted on the distribution and number of insects in the natural ecosystem of the dried-up part of the Aral Sea, the Ustyurt plain and the Akpetkey archipelago.

As a result, we witnessed the accumulation of insects inside and under the stems of desert plants - a natural biotope of the ecosystem, such as: camel thorn - Alhagi pseudalhagi, bristly tamarisk - Tamarix hispida, Caspian karelinia - Karelinia caspia, common harmala - Peganum harmala, reed - Scirpus affinis, hill saltwort - - Salsola collina, white goosefoot - Chenopodium album, narrow-leaved

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oleaster - Elaeagnus angustifolia, honey locust - Gleditschia triacanthos, turanga - Populus euphratica, saxaul - Haloxylon aphyllum, chestnut - Aesculus hippocastanum, shepherd's purse - Capsella bursapastoris, Japanese pagoda tree - Sophora janonica, stinking ferula -Ferula foetida, leafless juzgun -Calligonum aphyllum (Table 1).

As a result of observations from behind the salty sands in the dried-up part of the Aral Sea, the Ustyurt Plain and the Akpetkey Archipelago, due to the drying out of vegetation, the harmful properties of the following insect species were determined: the odorous wood borer - Cossus cossus, the alecto hawk-moth - Theretra alecto, the bindweed hawk-moth - Agrius convolvuli, the common tongue-moth - Macroglossum stellatarum, the turanga hawk-moth - Laothoe philerema, the alder leaf beetle - Agelestica alni, the red-breasted leaf beetle - Ouloma melanopus and the Turkestan termite - Anacfnthotermes turkestanicus, etc.

Pests cause serious damage to plants mainly in the larval stages, and beetles and worms of adult insects cause serious damage by gnawing out the leaves of plants [3]. In general, we all know that increased salinity and drying out of vegetation are negative aspects of climate change.

CONCLUSIONS

Thus, this process leads to the entire biocenotic change of the environment, i.e. the loss of one component of the natural environment negatively affects all factors. Therefore, drying out of the habitat due to lack of water creates opportunities for the active development of xylophagous pests. From this point of view, it is necessary to constantly monitor insect pests and develop programs of preventive measures against them

Table 1
Dominant insect pests found in the plant flora of the natural ecosystem of Karakalpakstan

№	Name of plants	Name of insects								
		A.alni	*T.alecto*	*C.cossus*	*L. philerema*	*A.convolvuli*	*O.melanopus*	*M.stellatarum*	*A. turkestanicus*	*A. ahngerianus*
1	*A.pseudalhagi*		+		+	+	+	+	+	+
2	*T.hispida*	+	+	+	+	+	+	+	+	+
3	*K.caspia*	+	+		+	+	+	+	+	+
4	*P.harmala*		+		+	+	+	+		
5	*S.affinis*		+		+	+	+	+		
6	*S.collina*		+		+	+	+	+	+	+
7	*C.album*		+		+	+	+	+	+	+
8	*E.angustifolia*	+		+	+	+	+	+	+	+
9	*G.triacanthos*		+		+	+	+	+		
10	*P.euphratica*	+		+	+	+	+	+	+	+
11	*H.aphyllum*	+		+	+	+	+	+	+	+
12	*A.hippocastanum*		+		+	+	+	+		
13	*C.bursapastoris*		+		+	+	+	+	+	+
14	*S janonica*		+		+	+	+	+		
15	*F.foetida*		+	+	+	+	+	+	+	+
16	*C.aphyllum*		+		+	+	+	+	+	+

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INFLUENCE OF CLIMATE CONDITIONS ON CHILDREN'S HEALTH

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ABSTRACT

The article examines the impact of climate change on children's health. Climate change is caused by an increase in greenhouse gases such as carbon dioxide, methane, and nitrous oxide. The impact of climate on children's health can be varied and includes risks associated with heat stress, allergies, infectious diseases, and many other aspects.

KEY WORDS: *climate, planet, atmosphere, fuels, energy, stress, allergy.*

In recent decades, climate change on the planet has become obvious. The life of all inhabitants of the Earth directly depends on the state of the climate. Climate change is caused by an increase in the amount of greenhouse gases, such as carbon dioxide, methane and nitrous oxide. Greenhouse gases trap heat in the atmosphere, increasing the temperature of the air and ocean. They mainly arise from the combustion of fossil fuels, such as coal, oil and gas. The main sources of greenhouse gas emissions include energy, industry, transport, construction and agriculture.

Economic calculations show that if the growth rates of modern energy based on burning fossil fuels continue in the future, the Earth's climate will change towards warming. Therefore, the problem of global warming on our planet is extremely urgent.

Global warming affects children both directly and indirectly. Children are more vulnerable to the human impacts of global warming than adults. The World Health Organization estimates that 88% of the current global burden of disease is attributable to global warming affecting children under 5 years of age. The Lancet review on health and climate change categorizes children as the most vulnerable to climate change. Children are physically more vulnerable to climate change in all its forms. Climate change affects a child’s physical health and well-being.

Global warming increases the concentration of ground-level ozone in the air, one of the main components of smog. Ground-level ozone is associated with a variety of health conditions, including decreased lung function, increased asthma attacks, and an increase in premature deaths. Climate change can increase the concentration of pollen. According to the WHO, pollen-related allergic rhinitis affects 10 to 30% of all adults worldwide and up to 40% of children.

Climate change is increasing rainfall, which can lead to flooding in some areas. Flooding has been linked to outbreaks of waterborne infections, such as diarrheal diseases, hepatitis A and E, and airborne infections.

Climate factors play an important role in children's health because children may be more vulnerable to changes in the environment. The impact of climate on children's health can be varied and includes risks associated with heat stress, allergies, infectious diseases and many other aspects.

Ученые, занимающиеся изучением климата, нашли зависимость влияния деятельности человека на изменение погодных условий, и, как следствие – глобальное потепление.

Global warming is an increase in the average temperature of the Earth, mainly caused by human activity

Global warming affects children both directly and indirectly. Children are more vulnerable to the effects of global warming on people than adults. The World Health Organization estimates that 88% of the current global burden of disease is due to global warming affecting children under 5 years of age

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Climate conditions play a significant role in shaping the health and functional indicators of children. Climate deviations can affect physiological processes, the body's adaptation and the ability of children to be physically active.

Children are physically more vulnerable to climate change in all its forms. Climate change affects a child's physical health and well-being.

The effects of climate change fall into two main categories: direct or indirect, immediate or delayed. The impact on a child's physical health includes: deaths and injuries, heat illness, exposure to environmental toxins; infectious diseases and other illnesses that occur at higher temperatures.

There has also been a significant increase in mental health and learning problems such as post-traumatic stress disorder (PTSD), depression and anxiety, sleep disorders, cognitive deficits and learning difficulties. In addition to physical impacts, there are psychological and mental health factors that threaten a child's well-being.

Children are vulnerable to the lack of basic natural resources caused by natural phenomena such as drought and flooding. It is estimated that children bear 88% of the global burden of disease due to climate change. The real threat is in disadvantaged areas that already suffer from environmental problems. This will lead to various diseases, disabilities, and high levels of child mortality.

Thus, climate change, along with other natural and anthropogenic factors, has a variety of impacts on children's health. The health effects of climate change on children include increased respiratory and cardiovascular diseases, injuries, infectious diseases, and threats to mental health. Therefore, addressing climate change is critical, especially when it comes to its impact on children.

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