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UNVEILING MENSTRUAL HYGIENE: AN ANALYSIS OF NFHS-5

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ABSTRACT

Menstruation, a natural and inherent process, has long been shrouded in a veil of stigma and taboo. Despite being a phenomenon specific to females, it has always been shrouded in mystery and mystique in many countries. Proper menstrual hygiene is essential to ensure comfort, prevent infections, and maintain the overall well-being of individuals during their menstrual cycle. The objective of the study is to study the hygienic methods of protection during the menstrual period. To analyze this paper, reports of NFHS-5 (2019-2021), along with existing literature have been reviewed to understand the hygienic methods of protection adopted by the girls during their menstrual period. The findings suggest that adolescent girls and women are using sanitary napkins followed by cloth and locally prepared napkins, tampons, and menstrual cups. Many taboos, such as not bathing during periods, appear to be shattering. More and more women are taking baths during their menstrual cycle and they are even bathing in the same bathroom where others bath. To eliminate myths and taboos around menstruation and to make it a positive experience for girls rather than a stressful one, a thorough awareness effort must be launched at all levels of society

KEYWORDS: *Menstruation, Hygiene, Sanitary Pads, Tampons, Bathing.*

INTRODUCTION

Menstruation has been whispered behind closed doors for centuries, seen as something to be concealed and denied. Menstruation (commonly known as a "period") is a natural biological process that millions of women endure every month. A period occurs when the uterus excretes blood and tissue from the uterine lining and exits the body through the vagina. Menstrual health is defined as complete physical, mental, and social well-being in relation to the menstrual cycle[1]. This definition illustrates the multidimensional character of menstruation and how menstruating women's lives can be influenced by their capacity to manage their menstrual health. Every month, 1.8 billion people worldwide menstruate. Millions of these girls, women, transgender men, and non-binary people struggle to regulate their menstrual cycle in a respectful and healthy manner[2]. Menstruation brings in a new phase - and new vulnerabilities - in the lives of adolescents. During menstruation, however, many adolescent females experience shame, harassment, and social exclusion. The first menstrual changes occur among the girls during their adolescent period, between 11 and 15 years, with a mean of 13 years[3]. Although a natural process, menstruation has always been linked with misconceptions and practices, sometimes resulting in adverse health outcomes.

Access to safe menstrual periods has long been a struggle for Indian women, particularly those in rural regions and lower socioeconomic categories. Menstruation, a natural and inherent process, has long been shrouded in a veil of stigma and taboo. Despite being a phenomenon specific to females, it has always been shrouded in mystery and mystique in many countries. Menstruation taboos keep women and girls out of many parts of social and cultural life. Some of these are beneficial, while others may be dangerous[4].

Restrictions On Women and Girls During Their Menstrual Period

Due to cultural, religious, and traditional beliefs, women and girls face a variety of restrictions throughout their menstrual period. The table below depicts examples of these restrictions in several Asian countries. Other countries throughout the world impose similar limitations.

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Restrictions on girls during their menstrual period in Afghanistan, India, Iran and Nepal.

I can't eat certain foods	I can't attend a religious function	I am not allowed to cook	I do not wash my body/shower/bathe	I do not play/play sports	I have to sleep separately from other members of the family	I do not attend school	I do not have any restriction placed on me
Afghanistan 70% West Bengal 50% Nepal 13%	Nepal 67% West Bengal 71 %	Nepal 46%	Afghanistan 70% Gujarat 98% Iran 52%	Nepal 10% West Bengal 43% Afghanistan 70%	Nepal 28 %	Afghanistan 29% West Bengal 16 % Nepal 3%	Nepal 11% West Bengal 15 % Afghanistan 15%

Source: HOUSE et al. (2012)

Girls' experiences of menstrual hygiene in school and their impact: Findings from Africa and Asia[5]

Days Missed From School Or Reduced Performance

- 95% of girls in Ghana sometimes miss school due to menstrual cycle.
- 86% and 53% of girls in Garissa and Nairobi (respectively) in Kenya miss a day or more of school every two months.
- In Malawi 7% of girls do not go to school on heavy days. Over a term, each girl misses 0.8 days.
- In Ethiopia 51% of girls miss between one and four days of school per month because of menses. 39% reported reduced performance.
- One study from Nepal indicated only 0.4 days were missed over the 180 days of the school year. Another study found only 3.4% of girls did not go to school when menstruating, but over half had been absent at least once due to menstruation.

Pain, Embarrassment, Fear, Shame

71% of girls in Iran and 54% of girls in Ethiopia experienced pain in their stomach or back during their period.
• 48-59% of girls in peri-urban areas and 90% in rural areas of Ghana felt ashamed during their period.
• 43-60% of girls in peri-urban areas and 95% of girls in rural areas in Ghana experienced embarrassment during their last period.
• 30% of girls in Malawi had been scared at menarche.
• Of those who experienced pain during their menses in Iran, 52% were also nervous during their period.

Menstrual Hygiene Practices

In Iran, 51% of girls wait eight days following the start of their period before taking a bath. In Afghanistan, 84% of girls never wash their genitals.
• 39% of girls in India and 80% of females in Afghanistan use water to wash their period but not soap protection.
• In Malawi, 30% of females do not use the restroom while menstruating. 20% of respondents also mentioned this women in Indian societies.
• In India, 60% of girls and 11% of females in Eithopia, change their menstrual cloth only once in a day.

Objective of the study

- To study the hygienic methods of protection during the menstrual period

Methodology

To analyze this paper, reports of NFHS-5 (2019-2021), along with existing literatures have been reviewed to understand the hygienic methods of protection adopted by the girls during their menstrual period. NFHS series provides information on population, health and nutrition in India. NFHS 5 data was collected from 636,699 households and 724115 women. The data was collected through survey questionnaires. The woman's questionnaires collected information from all eligible women aged 15-49, while for menstrual hygiene, women of age group 15-24 years were asked.

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RESULT AND DISCUSSIONS

1.1 Menstrual Hygiene Methods

Menstrual hygiene protection methods refer to the various products and practices used by menstruating individuals to manage their menstrual flow in a clean, safe, and hygienic manner. The uterine lining sheds during menstruation, resulting in the release of blood and tissue from the vagina. Proper menstrual hygiene is essential to ensure comfort, prevent infections, and maintain the overall well-being of individuals during their menstrual cycle. There are several types of menstrual hygiene products available, including:

1. **Menstrual pads** are absorbent pads made of cotton or other materials worn in the underwear to absorb menstrual blood.
2. **Tampons**: Tampons are small, cylindrical devices made of absorbent materials that are inserted into the vagina to collect menstrual blood.
3. **Menstrual cups**: Menstrual cups are bell-shaped, reusable devices made of medical-grade silicone or rubber that are inserted into the vagina to collect menstrual blood. They can be washed and reused for several years.
4. **Period panties**: These are underwear specially designed with built-in absorbent layers to manage menstrual flow without the need for additional products.

Proper menstrual hygiene involves using the right menstrual products and includes changing them regularly (usually every 4 to 8 hours) to prevent the risk of infection. Additionally, washing hands before and after handling menstrual products is essential to maintain cleanliness. In some communities and countries, access to menstrual hygiene products and education about menstrual health can be limited, leading to challenges in managing menstruation safely and with dignity. Efforts are being made worldwide to improve menstrual hygiene management and ensure that all individuals have access to safe and effective menstrual hygiene products and information. National Family Health Survey 5 have also reported the different types of hygienic method adopted by the adolescents girls and women in India.

Table 1 shows the background characteristics and the types of hygienic method adopted by the girls in India. From the table, it is found that 64.5 percent of adolescent girls are using sanitary napkins while 49.3 percent and 15.2 percent of girls are using cloth and locally produced napkins respectively.

Table 1: Background characteristics and types of hygiene method adopted

Background characteristics	Cloth	Locally prepared Napkins	Sanitary Napkins	Tampons	Menstrual cup	% using hygiene method
Age						
15-19	49.3	15.2	64.5	1.7	0.3	78.0
20-24	50.0	14.7	64.2	1.6	0.3	77.2
Residence						
Urban	31.5	14.1	77.5	1.8	0.5	89.6
Rural	57.2	15.3	58.9	1.6	0.2	72.6
Religion						
Hindu	49.2	15.3	64.2	1.6	0.3	77.6
Muslim	56.2	13.4	62.0	2.0	0.3	74.7
Christian	36.1	11.0	77.0	1.1	0.5	85.7
Sikh	28.4	25.5	72.8	0.9	0.5	93.6

A total 78 percent of adolescent girls are using hygienic methods of protection during their periods. A significant increase of 78 percent can be seen from 58.3 percent about five years back in NFHS-4. A significant increase in the use of sanitary pads in the age group of 20-24 can also be seen. From Table 1, it is also found that sanitary napkins are the most used hygienic products among both the age groups. After sanitary napkins, cloth is the most used product. Almost 50 percent of adolescent girls and women are using clothes. Tampons and menstrual cups are the least used products by women. On the basis of residence, it is found that the use of hygienic methods is significantly lower in rural areas 72.6 with that of urban areas 89.6 percent. The urban women are more familiar with and aware of the use of sanitary napkins and in maintaining hygiene methods. Another factor is the numerous taboos and misconceptions surrounding menstruation, many of which cause shame and stigma, particularly in rural communities. Girls and women start to feel uncomfortable going to pharmacies to buy period products as a result, and they could be hesitant to urge the male family members to do the same. The greater differences in period-product usage between urban and rural populations may be due to these factors.

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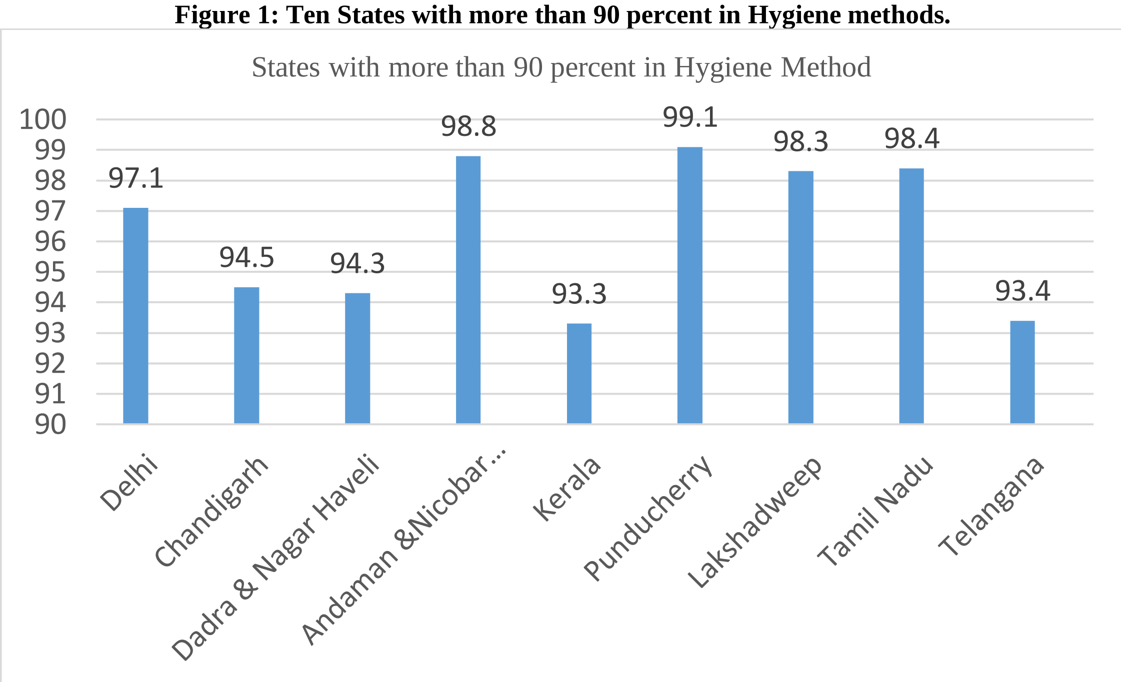
Differentials were also found on the basis of religion. It is found that Sikh 93.6 percent and Christian 85.7 percent are adopting hygienic methods followed by Hindu 77.6percent and Muslims 74.7 percent.

Table 1: Background characteristics and types of hygiene method adopted

Schooling	**Cloth**	**Local napkins**	**Sanitary pads**	**Tampons**	**Menstrual** cups	**% using hygiene method**
No schooling	80.0			1.1		
<5 years		11.0	32.6		0.1	
5-7 years	73.7			1.1	0.3	43.3
12 or more	69.0	11.6	40.3	1.3	0.2	51.3
years	35.2	13.5	46.8	1.9	0.4	59.4
		15.9	76.8			90.3
Caste						
SC	51.0	15.1	63.5	1.5	0.3	76.7
ST	60.8	13.9	52.9	1.9	0.3	65.6
OBC	51.2	15.9	63.6	1.7	0.3	77.7
Other	40.7	13.7	71.6	1.6	0.3	83.7
Wealth quintile						
Lowest	74.4	12.0	41.7	1.4	0.2	53.6
Second	61.9	15.3	56.8	1.7	0.2	71.1
Middle	47.6	16.3	68.0	1.6	0.2	82.1
Fourth	36.3	16.3	75.6	1.9	0.2	89.0
Highest	22.8	14.8	83.1	1.7	0.2	95.1

Education plays an important role in maintaining hygiene during the menstrual cycle. Students should be provided with adequate and timely information about menstrual hygiene and health. School can provide adolescent girls with knowledge, sanitary pads and facilities to understand and manage their periods. The above table shows that girls with higher than secondary level of schooling are more than twice as likely to be using a hygienic method than girls without any education level i.e. 90 percent versus 43 percent. The more the education the more chances of adopting a hygiene method during their menstrual cycle. On the basis of caste the use of hygienic methods is lower among the girls from scheduled castes and scheduled tribes than those belongings to other castes. Differentials can also be seen from the wealth quintile also. Those girls belonging to the highest wealth quintile are more likely to adopt hygienic method. It is found that 95.1 percent from the highest wealth quintile and 53.6 percent from the lowest wealth quintile are adopting hygienic method of protection.

Figure 1: Ten States with more than 90 percent in Hygiene methods.



Source: NFHS-5 (2019-2021).

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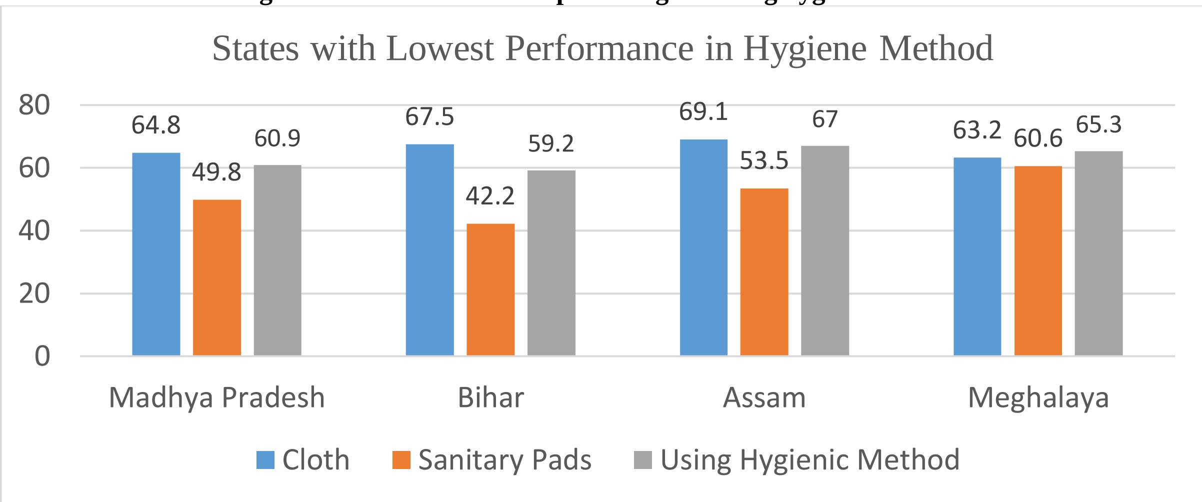
Figure 1 shows the percentage of women in India's states between the ages of 15 and 24 who use period products is 90% or more in 17 states and UTs reported using period products; in Puducherry and the Andaman and Nicobar Islands, the percentage was 99%. Figure 1 shows that in the national capital of India, Delhi 97.1 percent of women are adopting hygienic method during their menstrual cycle. Kerala, Tamil Nadu and Lakshadweep had 93.3, 98.4 and 98.3 respectively. The South Indian states are higher in hygiene management than other states because of the high literacy rate. The education of their children is a top priority in southern states. Compared to other costs, they spend more on education. This is also the reason why South India has a larger percentage of literate people than the rest of the country.

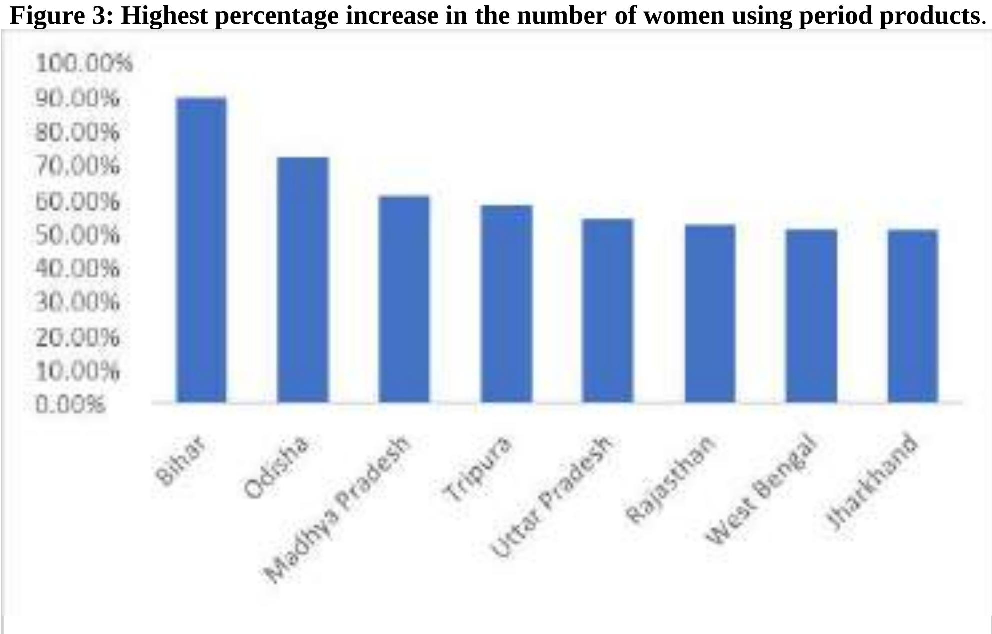
Figure 2: States with lowest percentage in using hygienic method



Source: NFHS-5 (2019-2021)

Figure 2 shows that some states are performing low in adopting hygiene methods. Women in seven states and UTs, including Tripura, Chhattisgarh, Assam, Gujarat, Meghalaya, Madhya Pradesh, and Bihar, used period products at a rate of 70% or less. The only state to register a figure less than 60% was Bihar. In these lowest-performing states, women are still using unhygienic methods of protection during their menstrual cycle. NFHS-5 data reveals that while sanitary napkins are the most popular product but still a larger portion of women use cloth as a method of protection during their menstrual period. In Madhya Pradesh, Bihar, Assam and Meghalaya 64.8, 67.5, 69.1 and 63.2 percent of women respectively use cloth as a method of protection during their periods.

Figure 3: Highest percentage increase in the number of women using period products.



Source: NFHS 4 & NFHS 5

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The top eight states that reported a rise in the percentage of female users of period products from NFHS-4 to NFHS-5 are shown in Figure 2. In terms of the proportion of women using period products, Bihar and Madhya Pradesh were first and third from the bottom, respectively, however Bihar showed an astonishing 90% growth, followed by Odisha (72%) and Madhya Pradesh (61%).

A Decline in Taboo?

Menstruation is still regarded as unclean and disgusting on a cultural level in many parts of India. This myth's origins can be traced back to the Vedic era and is frequently connected to Indra's killing of Vritras. Because women are said to have shared some of Indra's guilt, it is said in the Veda that the guilt of killing a brahmana-murder is said to manifest itself every month as menstruation[7]. In some regions of India, rigorous dietary restrictions are also observed and menstruating girls typically avoid sour foods like curd, tamarind, and pickles[8, 9]. Apart from dietary restrictions, women must follow specific restrictions like bathing. In many parts of the country, women are not allowed to take a bath during their menstrual period or for the first two days of their period. Water is said to be the most typical purifying medium. Therefore, protecting water sources from contamination is of utmost importance, which is a physical incarnation of Hindu deities[10, 11]. This brings to light a potential explanation for why women are forbidden to bathe during their periods, especially during the first few days. The latest report of National Family Health Survey reveals that this bathing taboo seems to be broken. Table 2 shows that women from both rural and urban India are taking bath during their menstrual period. It is found that 96 percent of adolescent girls between ages 15-19 are taking baths during their periods while same percentage of women i.e. 90 percent women of age group 20-24 are taking baths during their menses. It is found that 94 percent of women with no schooling is taking bath while the percentage is higher among women with 12 or more years of education i.e. 97 percent women takes bath during their menstrual cycle.

The difference in bathing can also be seen in different religion also. Table 2 shows that 97 percent of Hindu women takes bath followed by the Christian and Sikh women while the percentage is lower among the Muslim women. It is found that compared to other religions 87 percent of Muslim women takes a bath during their menstrual period. Caste base differences can also be seen. It is found that more than 95 percent women from scheduled caste, schedule tribe and other backward caste takes a bath while approximately 94 percent women from other castes takes bath during their menstrual period.

Table 2: Bathing Practice during Menstrual Period.

Background Characteristics	Urban	Rural	Total	Bathing in the same bathroom(Total)
Age				
15-19	95.8	96.1	96.0	92.4
20-24	96.4	96.9	96.8	92.3
Schooling				
No Schooling	90.6	94.6	94.0	90.7
12 or more years	96.7	97.1	96.9	94.4
Religion				
Hindu	98.0	97.9	97.9	92.4
Muslim	88.7	87.8	88.2	91.3
Christian	97.6	96.0	96.5	91.9
Sikh	97.6	96.5	96.8	98.7
Caste				
SC	97.2	97.4	97.3	91.7
ST	97.3	97.0	97.0	86.8
OBC	96.1	96.6	96.5	93.7
Other	95.3	94.6	94.9	93.0

Source: NFHS-5 (2019-2021)

When it comes to having a bath in the same bathroom as other family members, it has been observed that 92 percent of women between the ages of 15 and 19 and 20 and 24 do so. Additionally, 94 percent of women with at least 12 years of education versus 90.7 percent of women with minimal education are found to take baths in the same bathroom. Table 2's religious breakdown reveals that Sikh women, who make up 98.7 percent of bathers, are followed by Hindu, Christian, and Muslim women. Caste is another way to view the differences. Scheduled tribes are found to be less likely to take a bath in the same bathroom, with an average of only 86 percent compared to 93.7, 93, and 91.7 percent for other backward castes, other castes, and scheduled castes, respectively.

In India, 96.3 percent of women take a bath during their menstrual period. In almost every state of India, more than 95 percent of women are taking a bath during their menstrual cycle except Jammu & Kashmir (42.7%), Ladakh (36.6%), Manipur (84.7%), and Meghalaya (84.0%). Previously, women were not permitted to bathe in the same bathroom as other family members, but as time goes on, this taboo is about to be overturned. According to the fifth round of National Family Health Survey it is seen that in the maximum states of the country, more than 95 percent women takes bath in the same bathroom used by other household members.

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Some of the other states like Odisha (72.4%), West Bengal (74.8%), Assam (88.4%), Meghalaya (88.9%), Tripura (74.9%), Tamil Nadu (85.3%), Puducherry (87.7%) and Gujarat (88.2%) compared to other states, do poorly when it comes to members bathing in the same bathroom.

CONCLUSION

One of the most significant changes that occur in adolescent girls is the beginning of menstruation. Her health, personal cleanliness, and sense of empowerment and dignity depend on her using a healthy approach to menstrual management. Women use hygienic measures such as sanitary napkins, cloths, locally made napkins, tampons, and menstrual cups to prevent visible bloodstains during menstruation. During analysis of NFHS- 5 report, it was found that sanitary napkins were the most popular used product during the menstrual period, followed by cloth and locally made napkins. Menstrual cups and tampons were the least used products. Tampons and menstruation cups are less well known; therefore, there isn't a big enough market for store owners to stock up on them. Many women who might even be aware of such products are either too self-conscious to ask for them or could decide not to use them because of the stigma associated with them. Tampons and menstruation cups should no longer be considered taboo items, and women and girls should be encouraged to use reusable, hygienic goods. Many taboos, such as not bathing during periods, appear to be shattering. More and more women are taking baths during their menstrual cycle and they are even bathing in the same bathroom where others bath. To eliminate myths and taboos around menstruation and to make it a positive experience for girls rather than a stressful one, a thorough awareness effort must be launched at all levels of society. Additionally, it will support the empowerment of girls. In schools, students should be provided with reproductive health education in the classrooms that will raise their awareness of menstrual practices, sexuality, and puberty-related issues and eliminates traditional notions and myths about menstruation.

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A STUDY ON FINANCIAL PERFORMANCE OF DR. REDDY'S LABORATORIES LTD

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ABSTRACT
Dr . Reddy's Laboratories is an Indian multinational pharmaceutical company committed to providing affordable and innovative medicines for healthier lives and driven by the philosophy 'Good Health Can't Wait'. The company was founded by the Scientist and entrepreneur. Dr. K Anji Reddy in 1985. It is located in Hyderabad, Telangana, India. Dr . Reddy's manufactures and markets a wide range of pharmaceuticals in India and overseas. The company has over 190 medications, 60 Active Pharmaceutical Ingredients (APIs) for drug manufacture, diagnostic kits, critical care and biotechnology products. They have been catering to the needs of the pharmaceutical sector for over two decades with APIs being their core strength.

INTRODUCTION
Financial performance, as a part of financial management, is the main indicator of the success or failure of the companies. Financial performance analysis can be considered as the essence of financial decisions. Financial performance analysis is the process of evaluating the operating and financial characteristics of a firm from accounting and financial statements. Financial performance analysis is the process of evaluating the operating and financial characteristics of a firm from accounting and financial statements. The relationship between financial statements is established between items of financial to assess the liquidity, solvency, operational efficiency and profitability of the company.

STATEMENT OF THE PROBLEM
The pharmaceutical industry is a rapidly evolving sector with a lot of competition and regulatory challenges. Dr. Reddy's Laboratories is one of the leading pharmaceutical companies in India with a global presence. However, despite its success, the company has faced several financial challenges in recent years. This project aims to analyse the financial performance of D.R. Reddy's Laboratories to determine the reasons for any fluctuations and to provide recommendations for improvement.

OBJECTIVES OF THE STUDY
- To analyse and evaluate the financial health and performance of the company over a specific period of time.
- This could include an assessment of the company's revenue, profits, assets, liabilities, and other financial metrics.
- The purpose of the analysis may be to gain insights into the company's overall financial position, to identify strengths and weaknesses, and to make informed decisions about the company's future prospects.

RESEARCH METHODOLOGY
The research methodology in finance involves a systematic approach to the collection and analysis of data in order to answer specific research questions or test hypotheses. The following are some of the common research methodologies used in finance in this study.

REVIEW OF LITERATURE
- **John Pradeep Kumar and Mr. Rony Louis (2020**) Their research paper is based on a study of the liquidity position of the pharmaceutical leaders. The main objective of the study was to study the liquidity position and liquidity management strategies. They collected secondary data from online. The study concluded that these days many companies are using negative working capital and it is a sign of low cost working capital.
- **Kurbanhusain A. Kadiwala (2019)** Their study is about the impact of acquisition on financial performance in pharmaceutical sector. Their objective of the study was to analyse the impact and examine the financial performance is

improved or not. The source of data was secondary which is collected from annual reports. Their study concluded that overall financial performance of companies is decrease after acquisition**.**

- **Dr. Rajesh Tiwari and et al (2018)** Their study examines the impact of financial performance of large cap and mid cap Indian pharmaceutical companies. Their objective was to analyse the impact of financial performance on stock price. The study used secondary source of data which is collected from annual report, newspaper and magazine. The study concluded that the market price in case of Pharma company is not only depends on the financial performance but also the business environment.

ANALYSIS AND INTERPRETATION

Year	Operating Profit	Current ratio	Quick ratio	Net profit Ratio	ROA	ROI
2022	16.38	1.9	1.5	6.62	5.3	0.077
2021	23.88	2.9	2.2	12.6	11.7	0.150
2020	30.48	2.4	1.8	11.5	10.1	0.129
2019	29.49	2.3	1.7	10.2	8.8	0.112
2018	21.35	2.2	1.6	10.1	8.6	0.115

FINDINGS

- The standard current ratio is 2:1. The ratio in the later years was near to the ideal ratio, hence the current ratio has improved. The increase in ratio was due to the decrease in current liabilities along with the increase in current assets.
- The ratios grew unsteady from year to year. Since the ratios are near to standard, the quick ratio is quite satisfactory.
- The operating profit ratio was increased to 30.34% from 2017-2018 to 2021- 2022 but by comparing previous year with 2021-2022 the ratio was decreased which indicates unsteady growth, it shows mixed trend during the period
- Return on asset has been increased in the year 2018-2019 and slightly reduced in the subsequent years. However the ratio are not below 5% from the next following year.so it indicates that a company is more efficient in generating profit from its assets.
- The return-on-investment ratio was decreased from year to year. Which indicates that the money was not profitably utilized in the business
- The proprietary ratio has increased over time, suggesting that the total assets are mostly funded by shareholders' funds. Hence, it shall be a less risky scenario.

SUGGESTION

- The company should increase the current assets to efficiently manage its current liabilities. So that the unnecessarily blocked finance can otherwise be profitably used. Overall, the company's short-term financial position needs to be improved.
- The company has to improve its profitability position. Although the company's gross profit and operating profit increased, its net profit margin increased only marginally, indicating that the company's indirect expenses increased.
- Despite the fact that the company is profitable, it must carefully control costs and minimise expenses in order to avoid future financial difficulties. The company must control its cost. The return on investment is not satisfactory as expected. As a result, the company is overvalued.

CONCLUSION

The study on the financial performance of Dr. Reddy's Laboratories Ltd. provides an overview of the liquidity, solvency and profitability of the company. The financial performance of the company is analysed using ratio analysis to establish relationship between the items of financial statements. The overall financial performance of the company is satisfactory. Looking at the past five years, 2018-19 is regarded as the best financial year. The company is currently in a volatile phase. The analysis reveals that the company has to improve its liquidity. But it doesn’t mean the company is not able to meet its current obligations.

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THE METHOD USED BY JAMAL AL-DIN AL-ZAYLA'I IN WRITING "NASB AL-RAYAH"

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ABSTRACT
This article provides information about the writing method of the work "Nasb al-Rayah li Ahadith al-Hidayah" dedicated to the study of hadiths in the famous work "al-Hidayah" by hafith muhaddith, faqih Jamal al-din al-Zayla'i, a mature scholar of the Hanafi school.

The article also reveals the meaning of the invasions of Hadith science as applied by Imam Al-Zayla'i as well as the author's thought Ijtihad in some places.
KEY WORDS: *Zayla'i, al-Hidayah, Nasb al-Rayah, hadith, takhrij, hanafi, Al-Kutub As-Sittah, Sunan.*

INTRODUCTION

Hafiz Jamal al-din al-Zayla'i (d. 762/1361) in his work "Nasb al-Rayah li Ahadith al-Hidayah" described the narrations of the hadiths quoted by Imam Burhanuddin al-Marginani (d. 593/1196) in "al-Hidayah" and their places in the hadith collections, as well as the rights of the narrators of the imams of Jarh and Ta'dil brought them in a beautiful form.

The work "Nasb al-Rayah" is one of the treasures of knowledge of the Hanafi school. Also, the work is considered a valuable resource for other sects and is widely used by them. Because the unique feature of Zayla'i's work is that his work includes not only Hanafi, but also the arguments of all schools of thought. In this respect, the work "Nasb al-Rayah" was highly recognized by all Islamic scholars.

Experts who usually work on the Hadith takhrij have their own style of work, and mention the methods they use in the introduction to the work. However, Zayla'i did not even record the way in which the preamble to the "Nasb al-Rayah" carried out the Hadith takhrij. For this reason, it is difficult to give accurate information about his method in the taxrij. But, "Nasb al-Rayah" was studied, in which the following conclusion was made regarding the method used by Zayla'i. It can be divided into four types:

1. Method in terms of the overall structure of the work;
2. His method in matters of Hadith science;
3. His method in matters of Fiqh science;
4. Form of giving titles and narratives.

Zaylai wrote the title of the themes in "Nasb al-Rayah" in the same sequence as in "al-Hidayah", dividing it into books, chapters and seasons. "Kitab al-taharah", "Kitab al-salat", "Babu al-mau alladhi yajudhu bihi al-taharah", "Babu salat al-witr", "Fasl fi al-ghusl", "Fasl fi bayoni al-muharrimah" [1:1:1; 1:2:108].

In contrast, Burhanuddin al-Marginani added sections such as "Ahadith as-salat ala ash-shaheed", "Ahadith al-amr bi al-madmadah and al-istinshaq" for hadiths on subjects that did not assign to chapters or seasons. Also, Marghinani did not narrate, but he also analyzed the hadiths related to the chapters of "al-Hidayah", citing them under the name "Ahadith al-bab [1:1:16; 1:2:81]. Zaylai numbered the hadiths in the "al-Hidayah" separately in each chapter, but he did not add to the numeration what he had given the chapter.

Hadith is quoted as follows: The book of Taharah: Second Hadith: The Prophet, peace and blessings be upon him, said, **"When one of you awakens from sleep, do not let him dip his hands into the vessel until he washes them three times. Verily, he does not know where his hand spent the night."**. I (Zaylai) say, "this hadith is narrated by the six imams[1] in their books". After that, he quotes the muhaddiths who narrate the Hadith and their narrations [1:1:2,3].

[1] Imam Bukhari, Muslim, Abu Dawud, Tirmidhi, Ibn Majah, Nasa'i

Zailai says briefly about the order of quoting hadiths: “With the help of Allah, I will mention the hadiths I have found, starting with the most authentic ones” [1:1:162]. With this word, Zaylai is saying that it is easy to find the hadiths first, and he wrote down the lower levels in order, starting with the most authentic ones. The first narration related to the hadith narrated by Zaylai is the most authentic narration.

An example of this is the book “Roza”, the tenth hadith tahrij. Zaylai first cites the hadith "The Messenger of Allah (PBUH) said to a person who forgot to eat and drink (in the case of a fasting person): **“Finish your fast, Allah has given you food and drink.”** After this narration, Abu Dawud's hadith on the same topic, "A man came to the Prophet (pbuh) and said, 'O Messenger of Allah, I was fasting, I forgot to eat and drink,'" then the Prophet (pbuh) said, **“Allah made you eat and drink.”** From this order, it is understood that Zaylai initially wrote narrations that were close to Marginani's word for word and accepted as the most authentic [1:1:162; 1:2:157; 1:4:345].

If Marginani did not produce a hadith on the subject in any chapter or season, Zaylai says of that section, “there is nothing in it (depending on the Hadith)” [1:3:305].

If the hadiths were narrated by many muhaddiths, Zaylai sometimes called them without mentioning the name of each of them separately: رَوَاهُ الْجَمَاعَةُ (This hadith was narrated by a group of muhaddiths), أَخْرَجَهُ الْجَمَاعَةُ (This hadith was revised(takhrij) by a group of muhaddiths) or رَوَاهُ الْأَئِمَّةُ السِّتَّةُ (This hadith was narrated by six imams), أَخْرَجَهُ الْأَئِمَّةُ السِّتَّةُ (This hadith was revised (takhrij) by six imams). The expression "Six Imams" refers to the authors of "Al-Kutub As-Sittah". By the expressions أَخْرَجَهُ أَصْحَابُ السُّنَنِ (This hadith was revised (takhrij) by the Sunan Sahibs) and أَخْرَجَهُ الْأَرْبِعَةُ (The hadiths were revised by four of them) he meant Abu Dawud, Tirmidhi, Nasa'i and Ibn Majah [1:1:16].

If the information about some hadith comes in later sections, it is expressed by words like وَسَيَأْتِي قَرِيبًا ((Information about this hadith) will come soon), وَسَيَأْتِي بَيَانُهُ (Its explanation will come soon). At this point, he did not say in which chapter or topic it will appear. But in some he said سَيَأْتِي الْكَلَامُ عَلَيهِ في الْحَدِيثِ الثَّانِي إِنْ شَاءَ اللهُ تَعَالَى (The information on this topic will come in the second hadith, in shaa Allah) or سَيَأْتِي فِي حَدِيثِ الْإِسْفَارِ (The extensive information on this topic comes in the hadith “Isfar”) he partially said where it will come from [1:1:86,137].

Also, if Zaylai spoke about a hadith in the previous pages, it is not known where he said وَقَدْ تَقَدَّمَ الْكَلَامُ عَلَيهِ (This was mentioned before) or "وَقَدْ تَقَدَّمَ فِي "بَابِ الْإِمَامَةِ" (About this in the "Chapter of Imamate" passed at) clearly stated in which chapter it is [1:2:126; 1:3:128].

The form of quoting the ways of narration of the hadith. With his deep knowledge and sharp mind, Zaylai determined the ways of narration of the hadiths and tried to bring them all in the takhrij. He quotes them as follows:

For example, in the takhrij of the hadith of Aisha (ra) about refusing to take ghusl in water heated by the sun, he says: "فَلَهُ خَمْسُ طُرُقٍ" (There are five ways of this hadith). Then He narrates them one by one "The first - in the Sunan of al-Daraqutni and al-Bayhaqi, from Khalid ibn Ismail, from Hisham ibn Urwa, from his father, from Aisha", "The second - Ibn Hibban, in “Kitabu az-Zuafa” Abul Bakhtari, from Wahb ibn Wahb, from Hisham. ", "Third - Daraqutni this hadith from Haysam ibn Adi and Hisham", "Fourth - Daraqutni Amr ibn Muhammad from Asam, Falih, Urwa and Aisha", "The fifth way - Ismail ibn Amr in Daraqutni "Gharaibu Malik" this hadith from Kufi, from Ibn Wahb, from Malik, from Hisham [1:1:304].

The author usually cites the narrations of hadiths one by one, but sometimes he begins to write several lines. In this case, after phrases like "طَرِيقٌ آخَرُ" (another way) or "وُجُوهٌ آخَرُ" (another view), he pointed to other ways of the hadith.

While writing the takhrij, Zaylai states that he does not know some narrations or that he could not find them. In such places, it does not provide information about the text and narrators in the sense of "The hadiths we knew about this topic passed a while ago" or "I did not know this hadith." Maybe he says "غَرِيبٌ" (gharib hadith) or "غَرِيبٌ جِدًّا" (very gharib hadith) for such hadiths. These phrases are usually used for hadiths that have not been found [1:1:51,60; 6:9].
If he can't find the exact version of a hadith found in "al-Hidayah" in other books, فهذا حديث ما عرفته، ولا وجدته، والذي وجدناه من هذا النوع ما أخرجاه في "الصحيحين "عن أبي هريرة say: "I didn't know this hadith, I couldn't find it. Both of them narrated something similar in "Al-Sahihayn" from Abu Hurairah (ra), he cites other narrations close to the meaning of that hadith.

It is clear from this that Zaylai carefully studied the available sources in the process of finding hadiths. If he does not have knowledge about the hadith, he clearly stated that he does not know the hadith. Through this work, Zaylai showed the loyalty and honesty of a scientist. Qasim bin Qutlubgha (d. 879/1474), who lived after Zaylai, researched some of the hadiths left by him and wrote the work "Munyatu al-Almai".

Also, if the text of some of the hadiths quoted by Zaylai is long, in order not to drag out the topic and save time, he used some expressions to indicate that there is a continuation of it, citing only a part of it or a part of it related to the topic. For example: مُخْتَصَرٌ (abbreviated), وَفِيهِ قِصَّةٌ (this hadith has a story), تَنْظُر بَقِيَّةَ الْحَدِيثِ (see the continuation of the hadith), الْحَدِيث بِطَوْلِهِ (this hadith is long) [1:2:66; 1:3:48].

The fact that Zaylai did not avoid quoting the proofs of other madhhabs is one of his remarkable features that distinguishes him from other authors who search for the hadiths used as evidence in a certain madhhab and collect them in one place.

The evidences of the Maliki, Shafi'i and Hanbali madhhabs are "أَحَاديثُ الْخُصُومِ" (hadiths of the opponents), "أَثَر آخَر لِلْخُصُومِ" (another work of the opponents), "أحاديث الْخصوم العامّة" (hadiths of the opponents that indicate the commonality), "أحاديث الْخصوم الخاصّة" (characteristic hadiths of the opponents) with expressions like Then he cites their hadiths and narrations that they used as evidence [1:1:40; 1:2:266].

In some places, he found that the hadiths they used were weak (dhaif) and criticized them. He stated the opinions and final conclusions of the scholars about those hadiths. Of course, he was far from bigotry in this process. He also analyzed some weak hadiths in his book of takhrij. He cited in his hadiths that are evidence for or against his madhhab[1:2:261]. Marginani also mentioned the hadiths that the Hanafis did not use. "Another hadith that refutes their interpretation of this hadith", "Another hadith that supports our madhhab" [1:1:238; 1:3:386] and he touched on the hadiths that invalidated the evidence of other schools and applied his own school.

Zaylai says: "You should know that the musannif (Marginani) says, "The patient perform salah while standing. If he does not have the strength to do this, he sits down, and if he does not have the strength to do this, he prays by gesturing with his head. If he is not strong enough to do this, Allah is the most worthy to accept his excuse" while quoting the evidence of the hadith, if the patient is unable to sit, he says, "He lies on his back and stretches his legs towards the Qibla." Shofei contradicts this and says: "He prays lying on his side and facing the Qibla." Its proof is the hadith of Imran ibn Husain. Ali's hadith will not be a document for us" [1:2:176]. In this way, Zaylai writes who made what ruling from the hadith. He also said that one of the reasons why he does not accept the hadith as evidence is that the narrator of the hadith has been criticized too harshly.

Hadiths close to Marginani's wording or using his words وَ هُوَ دَلِيلٌ جَيِّدٌ (this is an excellent argument) [1:1:77; 1:2:90], as described by other madhhabs in the relevant arguments, he gave expressions to this effect.

CONCLUSION

In conclusion, it can be said that the work "Nasb al-Rayah" was written by Jamoliddin Zaylai with great care and precision. It can also be seen that Imam Zaylai used some istilahs that are not found in other takhrij works. This shows that the author has deep knowledge in hadith science. By studying the writing style of "Nasb al-Rayah", it becomes possible to fully understand the work and use it effectively, as well as to get enough information about the hadiths cited by Burhanuddin Marginani as evidence in "al-Hidayah".

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LIVED EXPERIENCES OF ELEMENTARY TEACHERS IN THE FULL IMPLEMENTATION OF IN-PERSON CLASSES

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ABSTRACT
The COVID-19 pandemic notably affected the educational system of the country through thcontinuous modifications and shift of instruction to remote learning instruction, and back again to full implementation of face-to-face learning in order to facilitate the continuity of learning. Thus, this study aimed to explore the lived experiences of elementary teachers of Quimayong Elementary School during the full implementation of in-person classes, especially considering the shift of instruction from modular learning due to COVID-19 pandemic. Of a qualitative design, descriptive-phenomenological research method was used to discover the lived experiences of the 10 elementary teachers, who have experienced teaching distance teaching modality, specifically, modular instruction, and its transition to face-to-face teaching instruction. Following the thematic analysis, it found out that there were 23 emerging themes from four major questions of the study. Few of these were conducting face-to-face classes more advantageous, making interventions in students' learning levels, difficulty in handling students' attitudes, difference of students' behaviors in modular and face-to-face instruction, and students' difficulty in different learning competencies. From this, the researcher concluded that the challenges encountered by the teachers have affected their approach and techniques toward teaching, and students' attitudes and level of learning due to the gap brought on by the pandemic. Significantly, teachers have accepted the inevitable reality brought by the circumstance and have strengthened their resolve and resiliency as mediums of imparting knowledge.
KEYWORDS: *Challenges, COVID-19, Full Implementation, Lived Experiences, Modular Instruction*

1. INTRODUCTION

The COVID-19 crisis had caused significant impacts changing the different aspects of society, notably affecting education systems through the continuous modifications and shift of instruction to remote learning instruction in order to facilitate the continuity of learning. UNESCO Learning Portal (2020) stated that eighty-seven percent (87%) of the world's student population was affected, and at one point fifty-two (1.52) billion learners were out of school. With this, joint effort of the organizations and educators in every country have restructured teaching and learning, and are continuously developing resilient and equitable education systems for the future, ensuring that the quality of education will continue amidst the worldwide outbreak of the COVID-19 pandemic (World Bank, 2020; UNESCO, 2022).

In response to COVID-19's occurrence in the Philippines in March 2020, the educational system of the country underwent a number of changes. The Department of Education (DepEd) applied the form of instruction that was being used by the teachers— the use of self-learning modules (modular); use of the Internet (online); TV-based or radio-based instruction; or a combination of the said modalities to provide effective instructions despite the challenges faced. It was also emphasized that the spread of the pandemic compelled schools to embrace modular learning as a substitute to face-to-face instruction, which increased the hardship for both students and teachers.

With DepEd's opening for the full implementation in August 2022, the educational shift towards the deployment of face-to-face classes as the new normal set-up re-emerged. According to Verde and Velero (2021), the repercussions of the pandemic have affected and continued to influence educational strategies and practices on a daily basis. Along with the sudden changes of the curriculum from time to time, it created additional job stressors for the educators. In the locale, the teachers of Quimayong Elementary School, Trento, Agusan del Sur struggled due to the long-term nature of the problem which has led to exhaustion by the given workload, and the difficulties to manage student behavior and supplement student learning.

The study was heavily influenced by the Transformative Learning Theory which focused mainly on adult learning experiences that investigated how adults interpret their life experiences and derive meaning from them, emphasizing that previous experiences were connected to new perspectives and opportunities on acquiring new understanding of things as they change (Western Governors University, 2020). Thus, this study aimed to explore the lived experiences of elementary teachers during the full implementation of

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in-person classes, especially considering the shift of instruction from modular learning due to COVID-19 pandemic. Specifically, it sought to answer the following:

1. What are the experiences of elementary teachers teaching face-to-face classes?
2. What challenges did elementary teachers encounter in handling face-to-face classes?
3. How did elementary teachers cope with the challenges encountered?
4. How did the experiences, challenges and coping mechanisms influence the teaching process in in-person classes?

2. METHODS

This study utilized a qualitative research design, specifically employing the descriptive-phenomenological research method. A qualitative research is defined as societal research that seeks to interpret the underlying meaning of the gathered data based from the human behavior, opinions, themes, occurrences, and motivations through observations and associated with interviews and discussions that will help in the understanding of a certain phenomenon (Crossman, 2019; Tenny et al., 2022). In line with this, descriptive phenomenological research design, also known as phenomenology, is a method of qualitative research that focuses on the similarity of an experience within a particular group that describes a specific phenomenon (Creswell, 2013).

2.1 Participants

The participants of the study were 10 elementary teachers, who have experienced teaching distance teaching modality, specifically, modular instruction, and its transition to face-to-face teaching instruction amidst the COVID-19 pandemic, from Trento Central Elementary School. Of non-probability sampling, a combination of purposive sampling and availability sampling were employed in selecting the participants. Purposive sampling focused on a particular characteristic of a population that is of interest or related to the study which will best enable the researchers to answer the specific research questions (Laerd Dissertation, 2012). On the other hand, availability or convenience sampling is where participants are selected for participation in the sample simply because they are the most accessible to the researcher (Nikolopoulou, 2022).

2.2 Data Collection Tool

A one-on-one in-depth interview was used by the researcher to perform in-depth interviews with a limited number of participants. The questions for the interview were validated by four (4) professional teachers. The entirety of the whole interview was audio recorded, where the participants were asked to discuss their experiences. The participants who were not comfortable with the questions had the privilege of not answering the questions. The findings that were collected were analyzed and transcribed by the researcher. With the help of transcription and thematic analysis, the researchers were able to identify the major themes that were based on the answers of the participants.

2.3 Data Analysis

The researcher used thematic analysis. Thematic analysis is a method for studying qualitative data that involves searching through a data set to identify, analyze, and report recurring patterns (Braun & Clarke, 2006). The researcher familiarized the data, established initial codes, searched for themes, analyzed themes, defined and named themes, and produced the report.

2.4 Research Ethics

The researcher followed the necessary rules in conducting research and that no rights of any participants or data collected may have offended somebody, this study has abided with the ethical consideration guideline to guarantee that the conduct of this study is anchored on the right protocol.

3. RESULTS

According to Braun and Clarke (2006), thematic analysis is a method for studying qualitative data that involves searching through a data set to identify, analyze, and report recurring patterns. Using this, the researchers were able to explore the different themes from the four major questions of the lived experiences of 10 elementary teachers of Quimayong Elementary School during the full implementation of in-person classes, especially considering the shift of instruction from modular learning due to COVID-19 pandemic. The themes were shown in the table below:

Specific Questions	Themes
Q1. What are the experiences of the participants in teaching face-to-face classes?	
1.1 What particular experiences have you had during modular instruction that you still apply now that we're back in face-to-face classes?	• Conducting face-to-face classes more advantageous
	• Making interventions in students' learning levels
	• Difficulty in handling students' attitudes
1.2 What particular experience did you encounter from the students that made you adjust to teaching face-to-face classes?	• Difference of students' behaviors in modular and face-to-face instruction
	• Students' difficulty in different learning competencies
Q2. What are the challenges the participants had encountered in handling face-to-face classes?	
2.1 What are the challenges that are new to you?	• The decline of students' learning level and skills
	• Getting students' interest and attention
2.2 What do you think are the causes of these challenges?	• Lack of parental intervention
	• Student's lack of interest
	• Students' exposure to technology and use of gadgets
2.3 How did you address these challenges you mentioned?	• Resilience
	• Identifying students' weaknesses and strengths
	• Collaborating with parents and school-related personnel
2.4 What did you consider in addressing these challenges?	• Adapting to the 21st century learning
	• Understanding of students' circumstance
	• Feedbacking
Q3. What are the coping mechanisms the participants employed in teaching face-to-face classes?	
3.1 What are the coping mechanisms you employ in teaching face-to-face classes?	• Implementation of teaching techniques
	• Having more patience
	• Acceptance
3.2 What kind of experience is your top priority to cope with?	• Student behaviors
	• Improving the learning competencies of students
Q4. How did the experiences, challenges and coping mechanisms influence their face-to-face classes?	
4.1 How do your strategies in distance learning influence your ways of teaching face-to-face classes?	• Namely longer patience toward students
	• Development of more efficient teaching strategies

Table 1. Themes of Lived Experiences of 10 Elementary Teachers of Quimayong Elementary School during the Full Implementation of In-Person Classes

4. DISCUSSION

With the emergence of the COVID-19 pandemic, face-to-face learning and all engagements between students and teachers within the school have been suspended. This of which became an avenue for the introduction of Modular Distance Learning (MDL) as an immediate solution to ensure educational continuity. Teaching and imparting knowledge requires more effort as students have experienced major learning loss and change in environment due to the pandemic, thereby, implying that recognizing and acknowledging that such changes have happened is essential for early adjustment. Furthermore, to address the difficulty of students in learning competencies, institutions should priory brief and train educators to prepare themselves; Educators should explore and utilize different teaching styles and activities that would is appropriate to the child's level of learning, provide interaction, as well as, aid in identifying their students' learning strengths and weaknesses in order to supplement on the aspects necessary to assist and support the student in developing and enhancing their competencies.

The participants highlighted making adjustments in their teaching strategies for face-to-face modality due to variations in students' attitudes and behaviors upon transition from modular learning to in-person instruction and given that modular learning is a remote learning modality, students' behavior and attitudes in the new normal perspectives influence their learning processes. Given that the participants focused on the decline of students' learning level and skills and difficulty in getting students' interest and attention in light of the apparent learning loss brought on by the pandemic, educators should address this concern by focusing on providing cognitive support to elementary learners during instruction and adjust themselves to the speed of learning of students.

The COVID-19 epidemic has an impact on many facets of education, including the role of parents as at-home instructors. This highlights the crucial parts played by parents and educators in a child's academic development. Nonetheless, as seen by the participants, there is a lack of responsiveness and little-to-no follow-up from parents regarding their children's progress in relation to increased family pressures and the changes brought about by the pandemic. They should emphasize to the parents or guardians that their participation in the activities would foster their children's development and skills. Constant communication through different mediums such as in-person meetings, sending letters, messaging platforms (eg. Messenger) and other avenues can be implemented in communicating student progress, follow-ups and addressing parent-teacher concern about the student.

The pandemic puts teachers' adaptability and flexibility to the test in times of crisis. As a result, it inspires them to think of new methods to communicate with their students. Prior to the COVID-19 crisis, all forms of learning assessment relied heavily on the physical presence of the students, either for administration or for tracking the learners' daily progress (Liberman et al., 2023). Educators' resilience is emphasized in the findings of the study. Teachers are pushed to change fundamental aspects of education by making policy and implementing necessary changes. In relation, the administration should engage their educators in training and workshops to help them adjust and give better instruction amidst the transition of modalities and the COVID-19 threat.
In order to deal with the difficulties encountered in face-to-face classes, the coping mechanisms of the participants include the acknowledgment and recognition of the situation that they are in. As a result, the educational system also adopted flexible teaching and learning methods, reorganized the curriculum, empowered the faculty, improved the infrastructure, implemented a strategic plan, and evaluated every part of this plan of transition (Dayagbil et al., 2021). Given this, institutions and educators are now given the responsibility of adapting to the present generation where they should engage in teacher development programs to improve their skills and learn new teaching methodologies such as self-exploration and seminars that would help them become better mediums of knowledge.

The effectiveness of the strategies utilized by elementary school teachers in face-to-face instruction is reflected in improved student outcomes and performance. It calls for educators to cultivate an evaluative mindset in order to continuously improve practice. Teaching effectiveness is influenced by growth-focused assessments of teaching practice, indicators of learning and welfare, and is supported by a supportive school culture. This urges educators to be adaptable and flexible in making necessary adjustments towards the circumstance such as employing different teaching techniques to cope with the challenges in supplementing students' competencies. Institutions should prioritize foremost the welfare of their employees in coping with the challenges brought upon by the transition of instruction. Moreover, they should involve activities that promote interaction and enhance student learning skills through methods such as socialization or practical application. In addition, instructors must incorporate the practice of extending their patience in their approach in teaching elementary learners.

The results of the study showed that elementary teachers have encountered challenges pertaining to the changes in instruction that have affected teachers' approach and techniques toward teaching, and students' attitudes and level of learning due to the gap brought on by the pandemic. Through these experiences, however, teachers have accepted the inevitable reality brought by the circumstance and have strengthened their resolve and resiliency as mediums of imparting knowledge. Furthermore, educators must focus on the integral aspects where students have presented deficiencies such as reading and comprehension. In that manner, they should implement effective teaching strategies aligned with the interventions provided by the Department of Education in order to satisfy standards, and meet the educational requirements of pupils.

Based on the findings, teachers must be able to assess themselves in terms of their teaching progress through correlating the effectiveness of their methods of teaching and its influence towards the learning improvement of students. This allows educators to be open to opportunities for improvement through finding ways in creating more efficient teaching strategies such as exploration through research, and involving themselves in workshops in collaboration with the institution. The effectiveness of teaching strategies is correlated to improved student outcomes and performance. Given this, teachers should gauge their students through implementing varied assessments that will assess their students' learning and skills. These strategies may include assessments through the traditional pen and paper tests, integrating learning tools for competencies, recitation and projects. Likewise, as highlighted, educators should be involved with their students through interaction and communication. This emphasizes that strengthening the relationship of teachers with their students encourages their students to be confident and leads them to success in their learning journey.

With exploring the lived experiences of Trento Central Elementary School teacher during the full implementation of in-person classes as the main focus of the study, it has highlighted the challenges, and coping mechanisms, as well as the influence of these aforementioned experiences encountered to the teaching process in relation to the transition of modalities from modular instruction in face-to-face classes.

5. CONCLUSION

The results of the study showed that elementary teachers have encountered challenges pertaining to the changes in instruction that have affected teachers' approach and techniques toward teaching, and students' attitudes and level of learning due to the gap brought on by the pandemic. Through these experiences, however, teachers have accepted the inevitable reality brought by the circumstance and have strengthened their resolve and resiliency as mediums of imparting knowledge. With that said, it is important for educators to focus on the integral aspects such as implementing effective teaching strategies to address educational deficiencies. Likewise, add to the knowledge and improve existing skills of students. In line with this, the institution at hand should recognize the struggles of their teachers thereby providing them support by means of seminars, training and workshops to improve teaching strategies and assist them in adapting and adjusting to teaching in the new normal setting of in-person instruction. Ultimately, providing these educators an avenue to improve and align themselves to being more effective teachers.

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APPENDICES

Appendix A: Endorsement Letter

ASSUMPTION COLLEGE OF NABUNTURAN
Nabunturan, Davao de Oro
GRADUATE STUDIES DEPARTMENT

1 8 NOV 2022
12:50

17 November 2022

MINERVA T. ALBIS, Ph. D.
Schools Division Superintendent
Division of Agusan Del Sur
Patin-ay, Prosperidad, Agusan Del Sur

MADAM:

One of your teachers in the person of **MS. CRUZA D. SABLAS,** who is connected with the Quimayong Elementary School, Quimayong, San Isidro, Trento Agusan del Sur, is our student in the Graduate Studies. Motivated by her desire to finish the Master's Degree, she is currently working on her thesis **"Lived Experiences of Trento District 1 Elementary Teachers in the Full Implementation of In-person Classes".** Taking cognizance of the nature and scope of the study, the research committee did not see any implications inimical to the vision and thrust of the Division Office and of the Department of Education in general. Nonetheless, the result of the study might even be beneficial to people who have stakes in the educative process.

The undersigned, through the Graduate Studies Department, is making this **endorsement** for said student to embark on the subject she intends to explore for her thesis as partial fulfillment of the requirements leading to the degree Master of Arts in Education Major in Elementary Education. As Assumption College of Nabunturan envisions for the overall professional development of its students, the undersigned hopes this endorsement merits it.

Anticipating on your positive response to this matter, I am

Very truly yours,

DR. ROEL P. VILLOCINO
Dean of Graduate School

Approved by:

MINERVA T. ALBIS, Ph. D.
Schools Division Superintendent

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Appendix B: Letter to the School Principal

Republic of the Philippines
Department of Education
CARAGA ADMINISTRATIVE REGION
SCHOOLS DIVISION OF AGUSAN DEL SUR

May 10, 2023

LEMUEL S. DELA VEGA
School Principal

Sir:

Greetings!

I hereby informed your good office that I am enrolled at Assumption College of Nabunturan taking Master of Arts in Education major in Elementary Education. One of my requirements is to conduct a thesis on "LIVED EXPERIENCES OF TRENTO DISTRICT I ELEMENTARY TEACHERS IN THE FULL IMPLEMENTATION OF IN-PERSON CLASSES".

In connection with this, I humbly ask permission from your good office to interview selected teachers from Trento Central Elementary School since they are the research key informants of this study.

Rest assured that any information given to this undertaking is treated with confidentiality and the processes of the system are the only things to be presented during the defense.

I am anticipating your positive approval of this request.

Very respectfully yours,

CRUZA D. SABLAS
Researcher

Approved by:

LEMUEL S. DELA VEGA
School Principal

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Title of the Study: **"The Lived Experiences of Trento District I Elementary Teachers in the Full Implementation of in-person Classes"**

Archival Number : ______________________

Site : ______________________

Facilitator : ______________________

Date : ______________________

Start Time : ______________________

End Time : ______________________

INTERVIEW GUIDE

1. **What are the experiences of the participants in teaching face-to-face classes?**
   1.1 What particular experiences have you had during modular instruction that you still apply now that we're back in face-to-face classes?
   1.2 What particular experience did you encounter from the students that made you adjust to teaching face-to-face classes?

2. **What are the challenges the participants had encountered in handling face-to-face classes?**
   2.1 What are the challenges that are new to you?
   2.2 What do you think are the causes of these challenges?
   2.3 How did you address these challenges you mentioned?
   2.4 What did you consider in addressing these challenges?

3. **What are the coping mechanisms the participants employed in teaching face-to-face classes?**
   3.1 What are the coping mechanisms you employed in teaching face-to-face classes?
   3.2 What kind of experience is your top priority to cope with?

4. **How did the experiences, challenges and coping mechanisms influence their face-to-face classes?**
   4.1 How do your strategies in distance learning influence your ways of teaching face-to-face classes?
   4.2 How do you evaluate the effectiveness of your strategies?
   4.3 How do these strategies help you and your pupils?

CRUZA D. SABLAS
Researcher

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Appendix E: Summary of Validation Results

Name of Researcher: CRUZA D. SABLAS Degree Enrolled: MAED ED.AD

Title of Research: The Lived Experience of Trento District I Elementary Teachers in The Full Implementation of In-Person Classes

Items					
	Expert 1	Expert 2	Expert 3	Expert 4	**Descriptive Rating**
1	4		4	4	Excellent
2	4	4	4	4	Excellent
3	3	1	4	1	Discard
4	3	2	4	4	Good
5	1	2	4	4	Discard
6	4	3	4	4	Excellent
7	4	1	4	4	Good
8	4	3	4	4	Excellent
9	4	3	4	4	Excellent
10	4	3	4	4	Excellent
11	4	3	4	4	Excellent
12		1	4		Discard

Panel of Validators:

Validated by: ______ Position of Validator: ______
Signature over Printed Name
Date of Validation: ______

Validated by: ______ Position of Validator: ______
Signature over Printed Name
Date of Validation: ______

Validated by: ______ Position of Validator: ______
Signature over Printed Name
Date of Validation: ______

Validated by: ______ Position of Validator: ______
Signature over Printed Name
Date of Validation: ______

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Appendix F: Informed Consent Form

INFORMED CONSENT FORM

I hereby give my consent for my participation in the Researcher's study entitled, **The Lived Experiences of Elementary Teachers in the Full Implementation of in-person Classes**. I know that this endeavor is a study of CRUZA D. SABLAS, a graduating student from Master of Arts in Education major in Education Administration of the Assumption College of Nabunturan, Nabunturan, Davao de Oro.

The researcher has already explained to me that my participation in this study will be engaged in a face-to-face interview which will require sensitive information regarding personal experiences connected to the study. The information obtained in this study is expected to discover the lived experiences of Trento District I elementary teachers in the full implementation of in-person classes. Furthermore, it was also explained that there will be no risk in my participation.

I know that my participation in this study is voluntary in nature and does not bear negative consequences to me if I choose not to participate. Any information I will provide shall be kept confidential. My name shall never be attached to any information gathered in this study and only Ms. CRUZA D. SABLAS has access to it.

I understand that I may discontinue my personal participation at any time I choose without penalty. Furthermore, we agreed to have a face-to-face interview on May 12, 2023.

Date: ______________________

____
Signature of the Participant

____
Printed Name (Optional)

CURRICULUM VITAE

Name: **Sablas, Cruza D.**

Address: **Prk. 6, Poblacion, Trento
Agusan del Sur**

Contact Number: **+63948-859-3604**

EDUCATION BACKGROUND

Degree	**School**	**Date Graduated**
Masters	Assumption College of Nabunturan Master of Arts in Education Major Education Administration	2023
Bachelor	Bukidnon State University	2018
High School	Prosperidad National High School	2013
Elementary	East Prosperidad Central Elementary School	2007

OCCUPATIONAL/EMPLOYMENT BACKGROUND

Position/Ancillary	**Inclusive Years**	**Institution/School**
Teacher I	2020 -Present	Quiamyong Elementary School
Elementary School Teacher	2018	Father Saturnino Urios College of Trento Inc.

ELIGIBILITY AND CERTIFICATIONS

LET Passer	September, 2018

I hereby signify to the correctness of the above-cited information.

CRUZA D. SABLAS

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LEGITIMIZING THE STABILITY OF HEALTH AND SAFETY PROGRAMS TOWARDS PRODUCTIVITY IN THE WORKPLACE

Felix C. Beril Jr., Viena S. Tapao, Deity Y. Beril, Remegio Bergamo Jr., John Henry Caballero, Benjamin Tiongzon, Edgar U. Tibay

ABSTRACT

This study analyzed the relationship between workplace health and safety variables including hazard environment, occupational health and safety, mental health awareness, engagement and support, policies and procedures, and productivity performance measures in terms of customer service and quality of work. The organizations analyzed were LGU and PAF. Data revealed that LGU generally performed better in the aforementioned variables, as indicated by higher mean scores and verbal descriptions (VD). However, statistical analysis failed to find a significant correlation between these health and safety variables and productivity performance for either LGU or PAF. The findings suggest that other variables may be at play in determining productivity, and future research should consider these additional factors and potentially re-evaluate the measurement of productivity. The importance of a healthy and supportive work environment, while not directly linked to productivity in this analysis, is underscored in terms of its contribution to employee wellbeing and job satisfaction.
KEYWORDS: *Stability of health and safety, productivity in the workplace, employee wellbeing*

INTRODUCTION

The concern for health and safety is legitimate in every context of human enterprise. Agwar et al. (2020) emphasized that improving the mental health of your workers can improve decision-making, thinking, confidence, and working relationships. Clifton & Harter (2019) noted that employees will feel that management is dedicated to their ongoing success on-the-job and in life. Empirical findings suggested that supporting mental health is also a wise business decision. Investing in the mental health work programs can have a cost savings effect by reducing absenteeism, presenteeism, disability claims, and lost productivity (Knapp & Wong, 2022). Moreover, it also contributes to helping you meet workplace health and safety guidelines to reduce legal exposure (Sinclair et al., 2020).

There are many ways a work environment can contribute towards poor mental health at work. Excessive stress and frustration due to toxic or inexperienced leadership and unclear communication can build up over time. Layer this with a lack of clear roles and expectations, long or inflexible work schedules, unrealistic demands, and lack of support for employees and it's no surprise a worker can feel unsatisfied, depressed, and exhausted (Virtanen, 2020). Other factors can compound the issue too many unpleasant or rote tasks, being subjected to discrimination, watching favoritism play out with coworkers, harassment or bullying, no sense of teamwork, and lack of recognition (Wiedenkeller, 2020). Don't overlook the ripple effect of mental health at work as employees struggle to balance personal and work demands as well as growing financial pressures (Lewis et al., 2022).

According to Morgado, Silva & Fonseca (2019) employee health and safety programs should be a major priority for management because they safe lives, increase productivity, and reduce costs. These health and safety programs should stress employee involvement, continued monitoring, and an overall wellness component (Maltseva, 2020). Work safety requires that safe working conditions should not create significant risk of people being rendered unfit to perform their work (Lingard et al., 2021). Health and safety at work is therefore aimed at creating conditions, capabilities, and habits that enable the worker and his/her organization to carry out their work efficiently and in a way that avoids events which could cause them harm (Mamurov et al., 2020).

Modern employees expect employers to help them live great lives. But improving employee wellbeing isn't just an exercise in altruism (Bucci, 2020). Employers who care for employee health and wellbeing see numerous measurable benefits, from higher productivity and profitability to lower turnover and fewer safety incidents (Sheik & Adhikari, 2022). Mental health and psychosocial support include any support that people receive to protect or promote their mental health and psychosocial wellbeing. Encourage exercise and regular social events to boost staff health, team work and mental wellbeing, such as lunchtime walking clubs or 'Lunch and Learn'. plan further improvements, enhance morale and increase productivity (Baik et al., 2019).

Without effective support, mental disorders and other mental health conditions can affect a person's confidence and identity at work, capacity to work productively, absences and the ease with which to retain or gain work (Van Weeghe et al., 2019). Twelve billion working days are lost every year to depression and anxiety alone. The most common mental health issues in the workplace are anxiety, depression and stress. Our employee wellbeing statistics revealed that 60% of working professionals experience at least mild symptoms of anxiety, and 1 in 4 meet the threshold for clinically relevant symptoms of anxiety (Solomou & Constantinidou, 2020). Furthermore, people living with severe mental health conditions are largely excluded from work despite this being important for recovery. Mental health conditions can also impact families, carers, colleagues, communities, and society at large. Depression and anxiety cost the global economy US$ 1 trillion each year predominantly from reduced productivity (Knapp & Wong, 2020).

Everyone has the right to work and all workers have the right to a safe and healthy working environment. Carbone (2020) stated that work can be a protective factor for mental health, but it can also contribute to worsening mental health. Work-related mental health conditions are preventable. Much can also be done to protect and promote mental health at work and support people with mental health conditions to participate fully and equitably in work (WHO, 2022).

Well-being perceived by employees is closely associated to producing good attitudes and actions of employees (Kooji et al., 2013). There is no agreed criteria for evaluating employee well-being, but looking at the broader conceptual definition of well-being, it refers to an individual's judgment of the amount to which he/she contributes to increasing his/her quality of life (Grzeskowiak & Sirgy 2007). In other words, employee well-being relates to the belief that the quality of one's life is improving through the health, happiness, comfort, and calm that employees feel while working (Moreno et al., 2021). A study on employee well-being indicated that improving employee well-being awareness had a favorable influence on mental health, job satisfaction, organizational commitment, and work-life balance (Baptiste, 2008; Sirgy & Lee, 2016). (Baptiste, 2008; Sirgy & Lee, 2016). When employees' well-being awareness increases, productive results such as good service quality and productivity improvements appear, and conversely, when the well-being perception of employees decreases, productivity and quality of work decrease and decision-making ability decreases (Edgar et al., 2017).

The favorable influence of the increase in perception of well-being is visible in the service business. In other words, customers who utilize products and services in the service industry, such as hotels, can sense employee emotion at service point of contact with employee, and the perceived emotion effects the customer's future behavior (Chong & Ahmed, 2017). (Chong & Ahmed, 2017). In other words, the degree of well-being felt by hotel employees is highly related to preserving the sustainable profitability of a company (Baek et al., 2018). (Baek et al., 2018). Thus, firm performance is very directly tied to employee performance, and hence, it is vital to boost the well-being awareness perceived by employees to improve employee performance (Maheshwari et al., 2022).

Self-rated mental health is a self-assessment of one's present mental health status (Pietila et al., 2015). In addition, mental health is more than just a condition of being free of illness or disease and can be considered to be a state in which the physical, mental, and social well-being have been fully realized (Magyar et al., 2019). In other words, mental and physical health are not independent of one other but are linked. Mental illness is one of the most frequent and costly health conditions that affects a person's mood, thoughts, and behavior, and causes severe pain and dysfunction for lengthy periods of time (Dimoff & Kelloway, 2019). (Dimoff & Kelloway, 2019). Anxiety and sadness have been recorded in 262 million persons globally and represent the leading causes of mental diseases. In addition, it has been reported that the cost burden of these diseases is more than 1 trillion dollars yearly associated with a decline in productivity (Ma et al., 2022).

For instance, industry personnel, such as those in hotels, are often required to engage with customers as part of their jobs, and this can cause emotional strain in the form of unhappiness or hopelessness (Kalargyrou et al., 2023). So, it is becoming increasingly important to consider how one feels about their own mental health. A number of factors in the workplace might have a negative impact on employees' mental health (Hamouche, 2020). Examples include improper behaviors and communication, poor levels of welfare, and unsuitable health and safety policies. Issues that negatively affect mental health can be ascribed to a decline in employee productivity (e.g., turnover, passive attitude, lower love for work), and moreover, can contribute to a decrease in corporate productivity and to increased expenditures. In particular, insufficient health and stability policies are particularly critical issues that might show as physical and mental health problems in employees. Thus, mental health disorders might function as a huge burden on enterprises, and hence, studies contributing to overcome such problems are urgently necessary (Yu et al., 2021). Many studies have speculated about the causes of mental and physical health problems in different establishments and among different groups of workers, but no research has yet looked at how the government helps its employees deal in terms of health and safety at work.

OBJECTIVES OF THE STUDY

The main objective of this research is to assess the current implementation status of mental health and safety measures within the identified agencies based in Lapu-Lapu. Conducting this assessment, the study aims to establish a basis for developing strategic health and safety mechanisms that promote productivity and enhance the overall quality of the workplace environment. Specifically, the research seeks to answer several key questions. Firstly, it aims to explore the perceptions of the respondent groups regarding the status of health and safety in relation to various aspects, including the hazard environment, Occupational Health and Safety (OHS) practices, availability of Mental Health Resources, level of Engagement and Supports, and adherence to policies and procedures. Additionally, the study aims to examine the productivity performance of the respondent groups to understand how it may be influenced by the existing mental health and safety measures. Ultimately, the findings of this research will be utilized to identify areas for improvement and to provide recommendations that contribute to the development of effective and holistic health and safety mechanisms, leading to a more productive and conducive workplace environment.

Methodology

The descriptive-correlational method of research was used in this study, which described data and the characteristics of the population under study. This method answered the questions who, what, where, when, and how. In particular, the present conditions of the respondents as regards to the status of the health and safety in terms of hazard, occupational health and safety, mental health resources, engagement and supports, and policies and procedures and perceived issues and concerns by the respondents. Data were described and analyzed through data gathered using the research instrument. The research locale is in Lapu-Lapu City. This questionnaire will be adopted the questionnaire from Workplace Mental Health Survey (2021). The questionnaire was analyzed and inline in the Philippines settings.

RESULTS AND DISCUSSION

Table 1. Hazard Environment

Indicators	PAF		LGU	
	Mean	**VD**	**Mean**	**VD**
Interact with chemicals or inflammable substances	2.20	D	2.18	D
Manually push or lift items that are more than 20 kgs	2.47	D	2.23	D
Do repetitive movements with your hands or wrists (packing, sorting, assembling, cleaning, pulling, pushing, typing) for at least 3 hours during the day	3.47	A	3.36	MA
Perform work tasks, or use work methods, that you are not familiar with.	2.27	D	2.49	D
Interact with hazardous substances such as chemicals, flammable liquids and gases.	1.53	SD	2.01	D
Work in high decibel levels	2.00	D	2.23	D
Grand Mean	2.32	D	2.42	D

Table shows PAF and LGU Hazard Environment Assessment results. Each organization's employees' hazard exposure is shown by mean scores and VDs. Assess chemical or inflammable substance interactions, manual handling of heavy goods, repeated hand or wrist movements, unusual labor activities or methods, dangerous substances, and high decibel levels. The mean scores reveal PAF and LGU workers confront different occupational hazards. Both organizations scored 2.20 on "Interact with chemicals or inflammable substances," falling into the "Disagree" category. Workers moderately reject such hazards. Both companies received mean ratings below 2.50 for "Manually push or lift items that are more than 20 kgs," indicating that employees moderately disagree with this danger. Both groups gave "Do repetitive movements with your hands or wrists for at least 3 hours during the day" higher mean ratings. PAF scored 3.47, "Agree," and LGU 3.36, "Moderately Agree." Both organizations' employees agree or moderately agree they work with repetitive hand or wrist movements. On the sign "Interact with hazardous substances such as chemicals, flammable liquids, and gases," the PAF scored 1.53, "Strongly Disagree," and the LGU 2.01, "Disagree." The PAF vehemently opposes this hazard, whereas LGU employees partially do. Both groups scored above 2.00 for "Work in high decibel levels," meaning "Disagree." Both organizations' employees moderately reject loud noise. PAF and LGU "Disagree" Grand Means are 2.32 and 2.42. Both firms' workers moderately oppose workplace hazards. These data demonstrate the need for occupational safety precautions. Risk assessments and prevention should make the PAF and LGU safer.

Table 2. Occupational Health and Safety

Indicators	**PAF**		**LGU**	
	Mean	**VD**	**Mean**	**VD**
I am clear about my rights and responsibilities in relation to workplace health and safety	3.87	A	4.49	SA
I am clear about my employers ‘rights and responsibilities in relation to workplace health and safety	3.60	A	4.44	SA
I know how to perform my job in a safe manner	4.13	A	4.64	SA
If I became aware of a health or safety hazard at my workplace, I know who (at my workplace) I would report it to	3.93	A	4.53	SA
I have the knowledge to assist in responding to any health and safety concerns at my workplace	4.20	A	4.10	A
I know what the necessary precautions are that I should take while doing my job	4.27	SA	4.40	SA
Grand Mean	4	A	4.43	SA

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Table 2 presents the occupational health and safety awareness of the Philippine Air Force and local government units. Based on the data, the Philippine Air Force had a mean score of 4 or higher in all indicators, indicating that the respondents had a high level of awareness of occupational health and safety. Meanwhile, the local government units had a mean score of 4 or higher in all indicators except for "I have the knowledge to assist in responding to any health and safety concerns at my workplace," which had a mean score of 4.10, indicating an average level of awareness. The grand mean for the Philippine Air Force was 4, while the grand mean for local government units was 4.43, indicating a higher level of occupational health and safety awareness among local government units compared to the Philippine Air Force.

Table 3. Mental Health Awareness

Indicators	PAF		LGU	
	Mean	VD	Mean	VD
Administrator provides free screening tools for depression, anxiety, substance use/abuse, PTSD, or other mental health concerns	2.27	D	3.61	A
Administrators provides initial assessments of a mental health issue/concern	2.07	D	3.65	A
Administrator provides digital mental health tools (i.e., online programs, mobile phone apps, wearables, etc.)	2.20	D	3.56	A
Our organization provides pay to offer any medical plan benefits	2.29	D	3.50	A
Our organization conduct regular and on-going check-in meetings and receiving guidance from leadership	2.27	D	3.86	A
Grand Mean	2.22	D	3.64	A

Table 3 compares PAF and LGU mental health awareness indicators. The Philippine Air Force (2.22) and Local Government Units (3.64) have quite different mental health awareness. The LGU moderately agrees with mental health awareness indices, whereas the PAF disagrees. These findings show that the LGU provides more mental health resources than the PAF. Due to organizational priorities, resources, and culture. For staff well-being, the PAF may need to strengthen mental health knowledge and assistance. Free mental health screening tools, initial assessments, digital technologies, and employee medical plan benefits could assist the PAF. Regular check-ins and leadership coaching would also improve workplace support. The PAF and LGU should collaborate to share mental health support best practices and lessons learned, according to the findings. The PAF may be able to apply the LGU's complete mental health strategy to their own organization. The report suggests the PAF should prioritize mental health awareness and support, implement appropriate interventions, and create a friendly corporate culture.

Table 4. Engagement and Support

Indicators	PAF		LGU	
	Mean	VD	Mean	VD
Our organization has provided adequate supports to address mental health during the pandemic	2.47	D	3.99	A
I have the support I need to stay healthy (physically and mentally) during this time	3.40	MA	4.11	A
I am having enough meaningful contact with my colleagues during the pandemic	3.20	MA	4.07	A
I have the resources, tools and access to the information that I need to carry out my work-related responsibilities effectively at home/remote.	3.33	MA	4.12	A
I feel comfortable communicating concerns to my Head/Supervisor related to the current situation.	3.00	MA	4.11	A
Grand Mean	3.08	MA	4.08	A

Table 4 presents a comparison of engagement and support indicators between the Philippine Air Force (PAF) and Local Government Units (LGU) during the pandemic. The grand mean scores for the Philippine Air Force (3.08) and Local Government Units (4.08) indicate a difference in engagement and support during the pandemic. The PAF moderately agrees with the indicators, while the LGU agrees. These results suggest that the LGU has provided more comprehensive engagement and support to its employees during the pandemic compared to the PAF. This could be attributed to differences in resources, communication channels, and organizational culture. The PAF may need to improve its support mechanisms and communication processes to ensure the well-being of its personnel

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during challenging times. The PAF could benefit from enhancing mental health support, fostering more meaningful contact among colleagues, and providing better resources, tools, and access to information. This would help improve overall employee satisfaction, engagement, and well-being, ultimately contributing to better productivity and resilience during crises.

Table 5. Policies and Procedure

Indicators	PAF		LGU	
	Mean	VD	Mean	VD
Everyone receives compulsory health and safety training	1.80	SD	3.79	A
Management is extremely particular about the certification	2.27	D	3.83	A
Systems are in place to identify, prevent and deal with hazards at work	2.47	D	4.07	A
Workplace health and safety is considered to be at least as important as production and quality	2.47	D	4.04	A
There is an active health and safety committee	2.60	D	4.06	A
Incidents and accidents are investigated quickly in order to improve workplace health and safety	2.87	MA	4.15	A
Communication about workplace health and safety procedures is done in a way that I can understand	3.13	MA	4.16	A
Grand Mean	2.64	MA	4.05	A

Table 5 presents a comparison of policies and procedures indicators between the Philippine Air Force (PAF) and Local Government Units (LGU). The grand mean scores for the Philippine Air Force (2.64) and Local Government Units (4.05) indicate a substantial difference in the perception of policies and procedures related to workplace health and safety. The PAF moderately agrees with the indicators, while the LGU agrees. These results suggest that the LGU has more robust policies and procedures in place for workplace health and safety compared to the PAF. This could be attributed to differences in organizational priorities, resources, and culture. The PAF may need to improve its policies and procedures to ensure the well-being of its personnel and compliance with health and safety standards. The PAF could benefit from implementing compulsory health and safety training, prioritizing certification, establishing systems to deal with hazards, and emphasizing the importance of workplace health and safety. Additionally, fostering an active health and safety committee and improving communication about workplace health and safety procedures would help create a safer work environment, contributing to employee satisfaction and well-being.

Table 6. Customer Service performance

Indicators	Description
I respond promptly to customers' inquiries and requests.	VS
I communicate clearly and effectively with customers.	VS
I am always professional and courteous when dealing with customers.	VS
I am always able to resolve customers' issues or concerns.	VS
I always show empathy and understanding when dealing with customers.	VS

Based on the indicators provided, the employee appears to provide excellent customer service. The employee has high ratings in all indicators, with ratings ranging from 4.08 to 4.15. The employee responds promptly to customers' inquiries and requests (rating of 4.13), communicates clearly and effectively with customers (rating of 4.15), and is always professional and courteous when dealing with customers (rating of 4.08). The employee also demonstrates empathy and understanding when dealing with customers (rating of 4.08), which can be important in building rapport and resolving customer issues. Although the employee's rating for being able to resolve customers' issues or concerns is slightly lower than the other indicators (rating of 3.92), it is still in the very satisfied range. It's important for employees to have the skills and knowledge to address customer issues or concerns in a timely and effective manner, as this can help maintain customer satisfaction and loyalty. This indicates that providing excellent customer service is crucial for businesses to succeed, and employees who consistently provide high-quality customer service can help a business stand out from its competitors. Employers should recognize and reward employees who demonstrate exceptional customer service skills, and provide training and resources to help employees improve their customer service skills.

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Table 7. Quality of Work performance

Indicators	Rating	Description
I always produce work that is completely accurate.	4.15	VS
I always pay close attention to detail and produce work that is of high quality.	4.00	VS
I always complete my work on time or ahead of schedule.	3.92	VS
I always produce work that is complete and meets all the requirements.	3.85	VS
I always produce work that is innovative and demonstrates creative thinking.	3.77	VS

Based on the indicators provided, the employee appears to produce work of high quality. The employee has high ratings in all indicators, with ratings ranging from 3.77 to 4.15. The employee consistently produces work that is completely accurate (rating of 4.15) and pays close attention to detail to produce work that is of high quality (rating of 4.00). The employee also completes their work on time or ahead of schedule (rating of 3.92), which is important for meeting deadlines and ensuring timely delivery of work. The employee also produces work that is complete and meets all the requirements (rating of 3.85), which is important for ensuring that the work is fit for purpose and meets the needs of the stakeholders. While the employee's rating for producing innovative and creative work is slightly lower than the other indicators (rating of 3.77), it is still in the very satisfied range. It's important for employees to think creatively and innovatively to come up with new and improved solutions to problems, and this can be an important contributor to business success. This indicates that LGU employees appears to be a highly competent and conscientious worker who produces work of high quality. Employers should recognize and reward employees who consistently produce high-quality work, and provide opportunities for training and development to help employees enhance their skills and knowledge.

Table 8. Significant Relationship Between the Status of the Health and Safety and Productivity Performance as to Customer Service

R squared: 0.287

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Remarks*
Hazardous Environment	-0.03672	0.304942	-0.12042	0.907	NS
OHSA	0.264956	0.427617	0.619609	0.551	NS
Mental Health Resources	0.614804	0.420884	1.460745	0.178	NS
Engagement and Support	-0.13508	0.586939	-0.23014	0.823	NS
Policies and Procedures	-0.34677	0.845824	-0.40998	0.691	NS

The model's R-squared value of 0.287 explains 28.7% of customer service productivity variability, according to the table. The P-value determines the importance of each independent variable's coefficient on the dependent variable. The Hazardous Environment variable has a coefficient of -0.03672 and a P-value of 0.907, showing that it does not significantly affect customer service productivity. The OHSA variable has a coefficient of 0.264956 and a P-value of 0.551, showing that it does not significantly affect customer service productivity. Mental Health Resources has a coefficient of 0.614804 and a P-value of 0.178, showing that it has no significant effect on LGU customer service productivity. Engagement and Support has a coefficient of -0.13508 and a P-value of 0.823, showing that it has no significant effect on LGU customer service productivity. The Policies and Procedures variable has a coefficient of -0.34677 and a P-value of 0.691, showing that it does not significantly affect LGU customer service productivity. According to the regression model, none of the independent variables—Hazardous Environment, OHSA, Mental Health Resources, Engagement and Support, and Policies and Procedures impact customer service productivity.

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Table 9. Significant Relationship Between the Status of the Health and Safety and Productivity Performance as to Quality of Work

R squared: 0.229756					
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Remarks*
Hazardous Environment	0.251388	0.244863	1.026648	0.331	NS
OHSA	0.230138	0.343369	0.670235	0.520	NS
Mental Health Resources	-0.03171	0.337962	-0.09383	0.927	NS
Engagement and Support	-0.52826	0.471301	-1.12085	0.291	NS
Policies and Procedures	0.317556	0.679181	0.467558	0.651	NS

The model's R-squared value of 0.229756 explains 22.98% of LGU work productivity performance variability, according to the table. The P-value determines the importance of each independent variable's coefficient on the dependent variable. The Hazardous Environment variable has a coefficient of 0.251388 and a P-value of 0.331, showing that it does not significantly affect LGU quality of work productivity performance. The LGU quality of work productivity performance is unaffected by the OHSA variable, which has a coefficient of 0.230138 and a P-value of 0.520. Mental Health Resources has a coefficient of -0.03171 and a P-value of 0.927, implying it has no significant effect on LGU quality of work productivity performance. Engagement and Support has a coefficient of -0.52826 and a P-value of 0.291, showing it has no significant effect on LGU quality of work productivity performance. Policies & Procedures had a coefficient of 0.317556 and a P-value of 0.651, showing it has no significant effect on LGU quality of work productivity performance. According to the regression model, none of the independent variables Hazardous Environment, OHSA, Mental Health Resources, Engagement and Support, and Policies and Procedures impact on work productivity performance.

CONCLUSION

Based on the provided data, we can conclude several things: Firstly, in terms of hazard environment, occupational health and safety, mental health awareness, engagement and support, policies and procedures, the PAF generally has lower mean scores and Verbal Descriptions (VD) compared to the LGU, indicating a comparatively poorer status. This indicates that the LGU has been more proactive and successful in implementing measures to ensure a safe and conducive working environment. Secondly, despite higher mean scores for LGU in occupational health and safety, mental health awareness, engagement and support, and policies and procedures, neither LGU nor PAF showed a statistically significant relationship with productivity performance in both customer service and quality of work. This suggests that other factors may be more influential in determining productivity performance, or perhaps the measurements used are not fully capturing the impacts of these variables on productivity. Finally, despite the limitations of the current analysis, it underscores the importance of a safe, healthy, and supportive workplace environment. Although no significant relationship was found with productivity in this particular analysis, such conditions contribute to employee well-being, job satisfaction, and retention, which are undeniably important in their own right. Further research might consider additional variables and potentially different ways to measure productivity to see if a significant relationship can be identified. It's also worth exploring the potential impacts of these factors on other important outcomes like employee satisfaction, turnover, and absenteeism.

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SECONDARY SCHOOL ADMINISTRATORS' PERFORMANCE COMPETENCY: BASIS FOR LEADERSHIP GUIDELINES

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ABSTRACT

The purpose of this research was to determine the leadership management function, which is primarily concerned with people and social interaction, as well as the process of persuading others to achieve the organizations or common goals. The study's participants were 35 public secondary school teachers from the Division of Laguna's Fourth Congressional District. The study used a validated researcher-made questionnaire as the primary instrument for gathering data and information from the study's many subjects. As per the findings of the study, secondary public-school teachers' assessments of their administrators' leadership capabilities have a substantial association with their administrators' performance competencies. As a result, administrators of public secondary schools may urge teachers to pursue and complete graduate degrees to advance their careers. Encourage teachers to participate in programs other than those run by the Department of Education for professional development, such as research festivals, short courses, seminars, and training, and other professional possibilities. Discuss and offer people the training and development they require to perform their jobs and reach their full potential. Different tactics for long-term mentorship and coaching should be included by school principals to support instructors, particularly freshly hired teachers. The Department head must be open to the suggestions of teachers under him/her to effectively derive the consensus of the teachers and come up with a better decision. Have regular open and honest two-way conversations about performance and assess the performance of employees consistently, equitably, and fairly and provide employees with feedback on how they are performing constructively and with respect. Ensure that developmental programs for aspiring school leaders' attention to encouraging participants to develop strategies for balancing work and other aspects of their lives. Lead a positive workplace culture by example and role model the right values and behaviors. Also, scholarship grants should be provided to willing teachers so that many can pursue their graduate studies. Even the teacher's organization with the initiative of the officers may propose financial assistance to those teachers to improve their teaching skills. A similar study should be conducted to verify the result of the study.

KEYWORDS *School Administrators, Leadership Capability, Performance Competency*

INTRODUCTION

Effective school managers are expected to be academically goal-oriented and supervise instructional and co-curricular practices accordingly. They motivate and support the teachers, encourage the community and other school stakeholders to be involved in the educational program, and encourage participatory decision-making. They are also faced with the complex task of creating a school-wide vision, being an instructional leader- planning for effective professional development, guiding teachers, handling discipline, attending important events and needs, and all the other minute details that come with supervising and managing a school [6]. The job of a school principal if not more demanding and difficult than an ordinary teacher, is expected to be equal, hence "the quality of school principals as school managers is a factor in improving the quality of education" (EDCOM 1992)

Since school principals are empowered and have all the authority to assign or choose a teacher to be the department head of each subject area, he/she may do so as for them to be part of the school administrators and school middle managers if there was none Head Teacher item in each department. Department head oversees the activities required to be implemented by a department. He / She is the lead to assign to each appropriate teacher the tasks for the development of a goal.

These designated or assigned department chairman will function as head teacher or leader in the department. Some principals specially those who are handling big schools where there are fifteen to twenty of teachers, they are adopting the qualification for Head Teacher item and be ranked accordingly These designated or assigned department chairman will function as head teachers or leaders in the department. Some principals, especially those who are handling big schools where there are plenty of teachers, are adopting the qualification for Head Teacher item and be ranked accordingly.

The researcher sought to find out more about the leadership management role, which is primarily concerned with people and social interaction, as well as the process of persuading others to achieve organizations or common goals. There can be no successful organization or corporation without effective leadership and the beginning of members' actions, as well as the encouragement of strong motivation and employee engagement. Managerial efficiency varies based on the leadership style of the managers, according to experience. To determine the extent to which school administrators in the Division of Laguna, such as department heads or department chairs, are responsible for various subject areas in public secondary schools. Division rises to the occasion and responds promptly in carrying out their duties and obligations, which may have had an impact on the teacher's ability to educate. The researcher would also like to find out the relationship of department head's leadership and core behavioral competencies affect the teaching competencies of a teacher.

LITERATURE REVIEW

A study conducted by Crowford, et al. [1] found that a relationship between head teachers and teachers is successful if it is built on fair treatment and mutual trust. However, if there is a lack of justice, it may result in a lack of faith in the head teacher. It is critical that a teacher has faith in the head teacher's abilities, respects his abilities, and values his accomplishments.

According to Day and Sammons [2] in the Review on School Leadership particularly on ethical or moral concern, the importance of values- and ethics-driven purposes in leadership decisions, staffroom relationships, classroom pedagogies, and 'can do' cultures or 'mindsets' of school improvement is often overlooked in more recent empirical mainstream leadership research – perhaps because it is more difficult to quantify.

The following are some of the practical implications of the study conducted by Wei, F. et al. [3]: First, the results suggest that leaders' authenticity may play an important role in improving followers' performance at work, and these performance gains are in the form of both task performance and organizational citizenship behavior. Although the significance of real leadership to job success is crucial, the moderating effect of leader competencies may be more remarkable. This pattern of findings shows that when a leader is competent, real leadership should be fostered even more. Second, the findings show that job engagement may be essential in authentic leaders' influence on their followers' performance. The fact that engagement has a direct impact on followers' work performance suggests that other than authentic leadership, it is possible to promote work engagement and improve followers' job performance. Job resources (i.e., job control, feedback, and variety), perceived value congruence, organizational support, and core self-evaluations, for example, have been found to promote work engagement in previous studies.

Tomal and Jones [4] did a study to look into cognitive competency, which highlights creative and critical talents that aid decision-making, problem-solving, and learning. Employees must be effectively communicated these aspects by a leader who develops a vision and tactics to attain that aim. Negotiation, persuasion, problem-solving, mentoring, and inspiring are just a few of the strategies used by leaders. The study by Almatrooshi, B et al. [5] suggests that leadership competency is a critical factor in any organization's success. Leadership competency can be increased by using cognitive, social, and emotional intelligence, according to the presented framework. These factors work together to define a leader's success, as well as providing metrics for identifying strong leaders. The suggested framework is based on theoretical research; however, empirical testing is required to assess the proposed framework's possible empirical applicability.

Jodar et al. [7] noted that at the organizational level, this entails balancing the demand for leaders and leadership, determined by the context in which the organization finds itself and the strategy it plans to use to achieve its goals, with the supply of people in leadership roles or being developed into such positions, who have the right knowledge, attitudes, abilities, and behaviors for these conditions. Individual leaders must define their leadership style and identity, as well as describe how these are important to the organization's leadership demands. Understanding both the context for leadership and the ability of the individual leader to function successfully in that situation is critical. An organization's leadership capability will be matched to the demands imposed on it, while the individual leader's capability will be matched to these demands. Turner [8] states that to achieve the organization's goals, the leader will develop a "strategic narrative" that articulates the meaning and purpose of the organization, unit, department, or team, links this with the attainment of stakeholder goals, and explains how individuals involved contribute to this narrative. To do so, you'll need to analyze yourself against the competences related to this crucial part of leadership. To begin, the leader will work to give the organization, unit, department, or team meaning through its plan and individual duties. This is a 'knowing interpreting' talent. Second, the leader will recognize opportunities for the organization's growth and development— she or he will drive for results and act as a force for change in achieving these objectives, particularly through an awareness of change dynamics. The leader will actively influence and engage in this to create situations and opportunities for change. Third, the leader will create and implement ways to align numerous stakeholders with the vision and strategy; she or he will also act as an advocate, influencing policy and negotiating resources to ensure delivery. A key part of the responsibility of the leader in the health sector organization is to generate meaning and purpose. Given the dynamics and resulting pressure to change, this part of leadership will necessitate not only personal insight into the need for change, but also deftness in involving the workforce in the ensuing strategy.

Turner [8] found that the self-reflecting leader examines performance on an ongoing basis and modifies behavior accordingly with the benefit of hindsight and insight. • Personal insight is necessary for a leader or potential leader to recognize his or her own capabilities and to use this information to become more effective once insight has been turned into action. Feedback from established human resource processes, such as 360-degree appraisals, evaluations, or coaching and mentoring, can be used to collect such knowledge. A profound grasp of one's leadership talents, values and beliefs, and preferred leadership style is known as personal insight. It is the foundation for determining leadership competence in any situation. Reflect on personal strengths and areas for development as provided by self-analysis or third-party feedback, of which a 360-degree appraisal is a common form; use the identified capability to form a leadership identity that is communicated through behavior and leadership action and

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recognized as authentic by followers; and execute leadership actions in a way that is sensitive to people and operational needs.

According to the findings of a study conducted by Gahan, P, et al. [9], high-performance work systems provide crucial foundations for dynamic capacities in more predictable situations. Organizations in high-speed markets, on the other hand, appear to be well advised to supplement normal development with investments in leadership competencies to enhance innovation and performance. To put it another way, our research shows that, beyond their immediate effects on performance, high-performance work systems can help organizations develop the capabilities needed for competitive advantage, but that this strategic value may require more than investments in complementary bundles of high-performance standards to be sustained.

The framework of this study is anchored on the Theory as stated in the DepEd Order no. 2 series of 2015 on, "Guidelines on the Establishment and implementation of the Result-Based Performance Management System in the Department of Education".

In an education system as stated in Philippine Human Development Report 2008-2009, This is about the ability to lead and manage a complex system of distributed players (such as schools) and layers of bureaucracy at a system level. Roles must be clearly defined in order to identify responsibilities and accountability within the company.

Thus, people management and leadership skills are essentials in realizing DepEd's goals, mission, and vision. Since the department head whether they were appointed or designated by the school head and not having the item position of the head teacher, still are managing people in the department.

What is the significance of people's performance management? They must ensure that their team members operate in accordance with the values that are important to their business and the health and social care sector. Investing time in managing their employees' performance is critical if they want to ensure that their team, service, and company are providing safe and dignified care that supports their health, wellness, and potential. It's also critical that they explain why it's so crucial to manage your employees' performance. When discussing the process with their staff, be sure to emphasize the positives and urge them to take responsibility for their own performance and development. It is critical to have systems in place and that they are adequately communicated since effectively managing performance may have a beneficial impact on how people feel about their jobs and their ability to work to the highest standards. Managers have the most power over their employees' performance.

To overcome these obstacles, organizations must undergo ongoing evolutions that result in change at all levels of leadership in all sectors. Teachers are becoming increasingly concerned about the administrative efficacy and efficiency of school leaders and department heads, particularly in our country's secondary public institutions. These fears may be justified, as a lack of good leadership may be a key factor in teachers' and students' poor performance in terms of teaching and learning. Given these concerns, the researcher believes it is necessary to investigate administrative challenges among department heads, as well as the prevailing factors influencing leaders' ability to provide effective school leadership and management.

METHODOLOGY

The researcher determined the assessment of the public secondary school teachers on leadership capabilities of their administrators in terms of leading people, performance management, people development, and professionalism and ethics. The performance competencies of the administrators in terms of efficiency and quality were included in the dependent variable.

This study tested that there is no significant relationship between the leadership capabilities and performance competencies of the administrators as assessed by the Public Secondary School Teacher.

The study was limited to the thirty-five (35) physical education teachers of 4 public secondary schools within the Teachers and Administrators of the Fourth Congressional District of the Division of Laguna, for the School Year 2020-2021. The instrument was adopted from the 2019-2020 RPMS. It has two (2) parts namely Administrators' Leadership Capabilities and Performance competencies. These schools were chosen based on their commonality which is having PE Teacher Coordinator.

This study was designed to do the following: Teachers will be benefited and motivated to work in the workplace where they are designated to and keep their performance rating at the very satisfactorily to outstanding in rate. Develop their fashion of work for the sake of the duties and responsibilities as teachers and the future of their students. The Administrator will also be benefited to work and improve their leadership capabilities also for him/her as leaders to find attention to encouraging participants to develop strategies for balancing work and other aspects of their lives; more opportunities for team members to experience professional development as a team - one version of this would include the chair of the governing body. Lead a positive workplace culture by example and role model the right values and behaviors.

This study employed a descriptive method of research. The survey instrument is to be used as the most common descriptive research method. It seeks to determine the present practices or opinions of a specified population. Catane [11] stated that descriptive research is concerned with describing the characteristics of the population and tried to find out the association of certain characteristics in the population.

The researcher consulted her statistician on the sampling techniques. Purposive sampling, also known as judgmental, selective, or subjective sampling, is a form of non-probability sampling in which researchers rely on their judgment when choosing members of the population to participate in their study. This sampling method requires researchers to have prior knowledge about the purpose of their studies so that they can properly choose and approach eligible participants. Researchers use purposive sampling when they want to access a particular subset of people, as all participants of a study are selected because they fit a particular profile.

This study utilized the following instruments including the validated researcher-made questionnaire which was used as the major instrument to gather adequate data and information from the respective subjects of the study. The teacher questionnaire consisted of two parts; the first part was about the assessment of the Public Secondary School Teachers on the leadership capabilities of the administration in four schools. The second part was the performance competencies of the

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administrators in terms of efficiency and quality.

The respondents were asked to place a checkmark on the responses they will choose from the given scale. A five-point rating scale was used to determine each part of the questionnaire. Each of the responses in the questionnaire was weighted as follows 5 with the verbal interpretation of always or excellent; 4 with often or very satisfactory; 3 with sometimes or satisfactory; 2 with never or fair and 1 with never of poor.

Scale	Range	Interpretation
5	4.20-5.00	Always/Outstanding
4	3.40-4.19	Often/Very Satisfaction
3	2.60-3.39	Sometimes/Satisfaction
2	1.80-2.59	Rarely/Fair
1	1.00-1.79	Never/Poor

Weighted mean - used to find out the average responses of the respondents as a measurement of the central tendency. The formula is described below:

$$X = \frac{\sum x}{N}$$

Where: X = computed weighted mean
$\sum x$ = the sum of the product of each response and frequency
N = total number of respondents

The leadership assessment of the 35 public secondary school teachers on the leadership capacities of the administrators was described using descriptive statistics of weighted mean and standard deviation.

The same statistical tools were used to describe the status of performance of the competencies of the administrators.

The Pearson "r" correlation coefficient was utilized to determine the substantial association between public secondary school teachers' assessments and administrators' leadership capabilities.

The same statistical approaches were utilized to find a significant association between public secondary school teachers' assessments of administration leadership capabilities and the performance of administrators' competencies.

To carry out this research, letters were written to Division Superintendent Dr. Marites A. Ibanez, requesting permission and consent.

Permission from the school head principal to conduct a study to the school where the teacher respondents were teaching. The researcher then created a self-made questionnaire to collect the data needed for the leadership capability guidelines on secondary school administrators' leadership capability and performance competency.

The responders were given copies of the questionnaire via Google Form. It was then administered. The acquired data was entered into a tally sheet under strict confidence. Following that, each indicator was given a code. The researcher's statistician was given the encoded data for descriptive analysis. The data was analyzed and presented in textual and tabular formats, with suitable interpretation.

RESULTS AND DISCUSSIONS

Assessment of Selected Public Secondary School Teachers on the Leadership Competencies of their Administrators terms of Leading People

Table 1 shows the data gathered in the assessment of the public secondary school teachers on the leadership competencies of the administrators in terms of leading the people. With self-awareness, communication, influence, and learning agility as the competences of the growth of leadership abilities, one can confidently pursue new possibilities and the next level of responsibility, as these qualities are required at every professional stage.

Table 1 Assessment on the Leadership Competencies in terms of Leading People.

LEADERSHIP COMPETENCIES Leading People	**Public Secondary School Teachers**	
	WM	**VI**
Uses basic persuasion techniques in a discussion or presentation e.g, staff mobilization, appeals to reason and/or emotions, uses data and examples, visual aids.	3.97	VS
Persuades convinces or influences others, to have a specific impact or effect.	3.97	VS
“Sets a good example”, is a credible and respected leader, and demonstrates desired behavior.	3.97	VS
Forwards personal, professional, and work unit needs and interests in an issue.	4.40	O
Assumes a pivotal role in promoting the development of an inspiring, relevant vision for the organization and influences other to share ownership of DepEd goals, to create an effective work environment.	4.32	O
Over-all WM	**4.12**	**VS**

It could be seen in the table that the assessment of selected public secondary school teachers as regards the leadership competencies of their administrators in terms of leading people is at a Very Satisfactory level as seen in the overall weighted mean of 4.12 as Very Satisfactory. It further showed that all the five (5) items about leading people were assessed as Very Satisfactory also. It implied that the administrators from the Fourth Congressional District of the Division of Laguna were very competent as leaders in the aspect of leading people.

It was supported by the research by Silva [11], the effectiveness of any organization is largely determined by the level of ability with which its executives implement strategies. The core of leadership, according to him, is a conditional relationship between a manager and his or her followers. Given the fact that achieving organizational goals is never easy, it is critical that leaders' tactics be adaptable enough to allow change. An organization's performance is also influenced by its employees, who are an integral part of the organization and comprise the team that works to achieve the organization's objectives.

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Assessment of Selected Public Secondary School Teachers on the Leadership Competencies of their Administrators in terms of People Performance Management

Table 2 shows the data gathered results on the assessment of the public secondary school teachers on the leadership competencies of their administrators in terms of people performance management. All the procedures and techniques that ensure that people are working to their full potential and embodying the company's ideals. When articulated in this manner, it may appear intimidating, yet as a manager, they should do it every day.

Table 2 Assessment on the Leadership Competencies in terms of People Performance Management

LEADERSHIP COMPETENCIES **People Performance Management**	**Public Secondary School Teachers**	
	WM	**VI**
Makes specific changes in the performance management system or n own work methods to improve performance (e.g., does something better, faster, at lower cost, more efficiently; improves quality).	3.80	VS
Sets performance standards and measures the progress of teachers based on department targets.	3.91	VS
Provides feedback and technical assistance such as coaching of newly hired teachers for performance improvement and action planning.	3.97	VS
States performance expectations clearly and checks understanding and commitment.	3.71	VS
Performs all the targets of a result-based performance management system supported by evidence and required documents/forms.	3.92	VS
Over-all WM	**3.86**	**VS**

The table shows that the assessment of selected public secondary school teachers as regards the leadership competencies in terms of people performance management is at a Very Satisfactory level as seen in the overall weighted mean of 3.86. It further showed that all the five (5) items about leading people were assessed as Very Satisfactory also. It implied that the administrators from the Fourth Congressional District of the Division of Laguna were very competent as leaders in the aspect of people performance management.

Assessment of Selected Public Secondary School Teachers on the Leadership Competencies of their Administrators terms of People Development

Table 3 shows the assessment of selected public secondary school teachers on the leadership competencies of their administrators' terms of people development. An administrator is essential to the proper operation of a firm since they give office support to either a person or a team. They may be responsible for answering phones, welcoming and guiding guests, word processing, spreadsheet, and presentation creation, and filing.

Table 3 Assessment on the Leadership Competencies in terms of People Development

LEADERSHIP COMPETENCIES **People Development**	**Public Secondary School Teachers**	
	WM	**VI**
Improves the skills and effectiveness of individuals through employing a range of development strategies.	3.42	VS
Facilities workforce effectiveness through coaching and motivating / developing people within a work environment that promotes mutual trust and respect.	3.44	VS
Conceptualizes and implements learning interventions to meet identified training needs through LAC Sessions.	3.74	VS
Does long–term coaching or training by arranging appropriate and helpful assignments, formal training, or other experiences to support a person's learning environment.	4.02	VS
Cultivates a learning environment by structuring interactive experiences such as looking for future opportunities that are in support of achieving individual career goals.	4.00	VS
Over-all WM	**3.72**	**VS**

It was revealed in the table that the assessment of selected public secondary school teachers as regards the leadership competencies of their administrators in terms of people development is at a Very Satisfactory level as seen in the overall weighted mean of 3.72. It further showed that it implied that the administrators from the Fourth Congressional District of the Division of Laguna were very competent as leaders in all aspects of people development given in the table. An effective people development strategy is key for success and being able to react to changing conditions.

Assessment of Selected Public Secondary School Teachers on the Leadership Competencies of their Administrators terms of Professionalism and Ethics

Table 4 revealed that the data gathered in the Assessment of Selected Public Secondary School Teachers on the Leadership Competencies of their Administrators in terms of Professionalism and Ethics. It needs a well-based standard of right and wrong that prescribes what public administrators ought to do in terms of duty to public service, principles, virtues, and benefits to society.

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Table 4 Assessment on the Leadership Competencies in terms of Professionalism and Ethics

LEADERSHIP COMPETENCIES Professionalism and Ethics	**Public Secondary School Teachers**	
	WM	**VI**
Demonstrates the values and behavior enshrined in the Norms of Conduct and Ethical Standards for public officials and employees (RA 6713).	3.78	VS
Practices ethical and professional behavior and conduct considering the impact of his/her actions and decisions.	3.90	VS
Maintains a professional image: being trustworthy, regularity of attendance and punctuality, good grooming and communication.	3.88	VS
Makes personal sacrifices to meet the organization's needs.	3.82	VS
Acts with a sense of urgency and responsibility to meet the organization's needs, improve systems and help others improve their effectiveness.	3.72	VS
Over-all WM	**3.82**	**VS**

It can be gleaned in the table that the assessment of selected public secondary school teachers as regards the leadership competencies of their administrators particularly in professionalism and ethics is at a Very Satisfactory level as seen in the overall weighted mean of 3.82. It further showed that all the five (5) items of professionalism and ethics were assessed as Very Satisfactory also. It implied that the administrators from the Fourth Congressional District of the Division of Laguna were very competent as leaders in the aspect of professionalism and ethics**.**

The findings are comparable in Day and Sammons [2] research on the Review on School Leadership, particularly on ethical or moral concern. An area of leadership so often overlooked in more recent empirical mainstream leadership research – perhaps because it is more difficult to quantify – is the key role that values- and ethics-driven purposes play in leadership decisions, staffroom relationships, classroom pedagogies, and 'can do' cultures or 'mindsets' of sc.

Assessment of Selected Public Secondary School Teachers on the Leadership Competencies of their Administrators in terms of Teamwork

Table 5 shows the data and results on the assessment of the selected public secondary school teachers on the leadership competencies in their administrators in terms of Teamwork. Teamwork can be defined as the ability to work with others through cooperation and communication to accomplish a common goal Baker, Salas, King, Battles & Barach, 2005; Ballangrund et al. [13]. Teamwork can reduce workplace errors, increase employee and client happiness, and create possibilities for professional development. [14-15] Ballangrund; Hwang & Ahn.

Table 5 Assessment on the Leadership Competencies in terms of Teamwork

LEADERSHIP COMPETENCIES Teamwork	**Public Secondary School Teachers**	
	WM	**VI**
Willingly does his/her share of responsibility.	3.86	VS
Promotes collaboration and removes barriers to teamwork and goal accomplishment across the organization.	3.70	VS
Applies negotiation principles in arriving at win-win agreements.	3.78	VS
Drives consensus and team ownership of decisions.	3.39	S
Works constructively and collaboratively with others and across organizations to accomplish organizational goals and objectives.	3.44	S
Over-all WM	**3.63**	**VS**

It can be seen in the table above that the assessment of selected public secondary school teachers as regards the leadership competencies of their administrators particularly in the aspect of teamwork is at a Very Satisfactory level as seen in the overall weighted mean of 3.63. It further showed that two (2) items about teamwork were assessed as Satisfactory only. These are "Drives consensus and team ownership of decisions;" and "Works constructively and collaboratively with others and across organizations to accomplish organizational goals and objectives." It implied that the administrators from the Fourth Congressional District of the Division of Laguna need to investigate the issues of Items 4 & 5 to be very competent as leaders in all aspects of teamwork.

Assessment of Selected Public Secondary School Teachers as Regard the Performance Competencies of Administrators

Table 6 shows the Assessment of Selected Public Secondary School Teachers as Regard the Performance Competencies of Administrators in terms of efficiency. The capacity to run efficiently is a leadership skill that goes hand in hand with the organization. Simply said, efficiency implies not wasting time while working toward a goal. A leader's time will be better spent if they have a clear direction, a goal to focus on, and the motivation to achieve it.

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Table 6 Assessment on the Performance Competencies in terms of Efficiency

PERFORMANCE COMPETENCIES Efficiency	Public Secondary School Teachers	
	WM	VI
Manage the processes and procedures in monitoring student achievement	3.59	VS
Develop/adapt a research-based school program.	3.65	VS
Conduct Instructional Supervision using an appropriate strategy	3.43	S
Evaluate lesson plans as well as classroom and learning management	3.76	VS
Provide in a collegial manner timely, accurate, and specific feedback to teachers regarding their performance.	3.59	VS
Over-all WM	**3.60**	**VS**

Note: 1.00-1.49 (P); 1.50- 2.49 (US); 2.50 - 3.49 (S); 3.50 - 4.49 (VS); 4.50 - 5.00 (O)

It can be gleaned in the table that the assessment of selected public secondary school teachers as regards the performance competencies of their administrators in the aspect of efficiency is a very satisfactory level as shown in the overall weighted mean of 3.60. It further showed that one (1) item about efficiency was assessed as satisfactory only. This is the “Conduct Instructional Supervision using the appropriate strategy.” It implied that the administrators from the Fourth Congressional District of the Division of Laguna need to investigate the issue of Item 3 to be very competent as leaders in all aspects of efficiency.

This was supported in the study conducted by Gahan, P, et al. [9], capabilities to develop and market innovative products and services remain at the center of successful firms, according to [9]. Organizational competencies to recognize new developments and changing situations, grab appropriate opportunities, and restructure organizational assets in light of the situation underpin innovation. We also illustrate how organization-level routines, as well as effective leadership, support these organizational capacities.

Assessment of Selected Public Secondary School Teachers on the Performance Competencies of their Administrators in terms of Quality

Table 7 shows the assessment of the public secondary school on the performance of the administrators in terms of quality. Integrity, accountability, empathy, humility, resilience, vision, influence, and positivity are the most vital attributes of a good leader. "Management is about convincing people to do things they don't want to do, whereas leadership is about motivating people to achieve things they never imagined possible."

Table 7 Assessment on the Performance Competencies in terms of Quality

PERFORMANCE COMPETENCIES Quality	Public Secondary School Teachers	
	WM	VI
Utilize assessment results to improve learning	3.67	VS
Create & manage a school process to ensure student progress is conveyed to students and parents/guardians regularly.	3.79	VS
Address deficiencies and sustain successes of current programs in collaboration with teachers and learners.	3.61	VS
Recognize the potentials of staff and provide opportunities for professional development.	3.37	S
Provide expert technical assistance and instructional support to teachers	3.57	VS
Over-all WM	**3.60**	**VS**

Note: 1.00-1.49 (P); 1.50- 2.49 (US); 2.50 - 3.49 (S); 3.50 - 4.49 (VS); 4.50 - 5.00 (O)

As seen in the table, the assessment of selected public secondary school teachers as regards the performance competencies of their administrators in the aspect of quality is at a very satisfactory level as shown in the overall weighted mean of 3.60. It further showed that one (1) item of innovation was assessed as satisfactory only. This is the “Recognize potentials of staff and provide opportunities for professional development.” It implied that the administrators from the Fourth Congressional District of the Division of Laguna need to investigate the issue to be very competent as leaders in all aspects of quality.

Table 8 Assessment on the Leadership Competencies and Performance Competencies (Over-all)

Table 8 shows the results on the leadership performance competencies of the administrators. It includes the leading the people, people performance management, people’s development, professionalism and ethics and teamwork that is considered as an important tool to measure how capable is the leader when it comes to leadership. It is important to consider the strong communication skills that might develop the harmonious relationship of the one organization. The performance competencies

Leadership Performance Competencies of the Administrators	Public Secondary School Teachers	
	OWM	VI
Leading People	4.12	VS
People Performance Management	3.86	VS
People Development	3.72	VS
Professionalism and Ethics	3.82	VS
Teamwork	3.63	VS
Performance Competencies of their Administrators		
Efficiency	3.60	VS
Quality	3.60	VS
Grand WM	**3.76**	VS

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Table 8 revealed that the assessment of selected public secondary school teachers as regards the leadership performance competencies of their administrators particularly in Leading People, People Performance Management, People Development, Professionalism and Ethics, Teamwork, Innovation, Leadership Performance Competencies of their Administrators, Efficiency and Quality are at a very satisfactory level as seen in the grand weighted mean of 3.76. It further showed that all the variables about leadership performance competencies were assessed as Very Satisfactory. It implied that the administrators from the Fourth Congressional District of the Division of Laguna were very competent leaders and their performance exceeded expectations, and the set target is consistently demonstrated.

Table 9 Pearson r Correlation for Leadership Capability in terms of Creating a Professional Learning Community and Performance competencies.

	Computed r value	r 2	Critical Value	Verbal Interpretation	Decision
Creating a Professional Learning Community and Leading People	-0.64274968	0.41	0.095	Significant	Reject Ho
Creating a Professional Learning Community and People Performance Management	0.766081632	0.59	0.095	Significant	Reject Ho
Creating a Professional Learning Community and People Development	0.249879206	0.60	0.095	Significant	Reject Ho
Creating a Professional Learning Community and Professionalism and ethics	0.311258459	0.10	0.095	Significant	Reject Ho
Creating a Professional Learning Community and Teamwork	0.637159699	0.41	0.095	Significant	Reject Ho
Creating a Professional Learning Community and Efficiency	-0.534762878	0.29	0.095	Significant	Reject Ho
Creating a Professional Learning Community and Quality	0.970298354	0.94	0.095	Significant	Reject Ho

Table 9 shows that the school administrators in the Fourth Congressional District of the Division of Laguna as assessed by the Selected Public Secondary School Teachers in terms of Leadership Capability particularly in Creating Professional Learning Community and the different indicators for Leadership Performance Competencies such as Leading People, People Performance Management, People Development, Professionalism and ethics, Teamwork, Innovation, Efficiency, and Quality are Significant thus the null hypotheses are rejected.

For Creating a Professional Learning Community and Quality with the highest computed r-value of 0.97, this correlation represents a Very High Correlation. The correlation that exists between Leadership Capability in Creating a Professional Learning and quality is about 94%. Then, for Creating a Professional Learning Community and People Development the computed p-value is 0.24. This correlation represents a Low Correlation. The correlation that exists between Leadership Capability in Creating a Professional Learning Community and People Development is about 60%. For Creating a Professional Learning Community and People Performance Management with the computed r-value of 0.76, this correlation represents a High Correlation. This correlation that exists between the leadership capability in Creating a Professional Learning Community and People Performance Management is about 59%. For Creating a Professional Learning Community and Teamwork with the computed r-value of 0.63, this represents correlation a Moderate Correlation. This correlation that exists between leadership capability in Creating a Professional Learning Community and Teamwork is about 41%. Then for Creating a Professional Learning Community and Leading People with the computed r value of -0.64, this represents correlation that is a Moderate Correlation. The correlation that exists between the leadership capability in Creating a Professional Learning Community and Leading People is about 41%. Then for Creating a Professional Learning Community and Efficiency with the computed r value of -0.53, this represents correlation a Moderate Correlation. The correlation that exists between Professional Learning Community and Leading People is about 29%. Then for Creating a Professional Learning Community and Professionalism and ethics with the computed r-value of 0.31, this represents a correlation that is a Low Correlation. The correlation that exists between the leadership capability in Creating a Professional Learning Community and Professionalism and ethics is about 10%. Lastly, for Creating a Professional Learning Community and Innovation with the computed r value of -0.10, this correlation represents a Negligible Correlation. The correlation that exists between leadership capability in Creating a Professional Learning Community and Innovation is almost 1%. All of these were found to be significant and with the greater computed r-value to the critical value of 0.095, thus the null hypotheses are rejected.

The result implies that school administrators should strengthen their leadership skills in terms of Creating a Professional Learning Community because it directly affects their Leadership performance so the following indicators should always be observed and considered: “Ensures that the School Plan for Professional Development(SPPD) emerges from the Individual Professional Plan for 'Development (IPPD) and other identified needs of school personnel included in the SIP/AIP”; “Mentors and coaches employees and facilitates the induction of new ones”; “Ensures that the objectives of the school development plan are supported with resources for training and development programs”; “Assesses and analyzes the needs and interests of teachers and other school personnel”; “Develops programs and projects for continuing personal and professional development including moral recovery and values formation

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among teaching and non-teaching personnel".

Table 10 Pearson r Correlation for Leadership Capability in terms of Leading and Managing Change and Performance competencies.

	r value	r 2	Critical Value	Verbal Interpretation	Decision
Leading and Managing Change and Leading People	-0.71897527	0.52	0.095	Significant	Reject Ho
Leading and Managing Change and People Performance Management	0.854811954	0.73	0.095	Significant	Reject Ho
Leading and Managing Change and People Development	-0.011583308	0.00	0.095	Not Significant	Accept Ho
Leading and Managing Change and Professionalism and ethics	0.443186297	0.20	0.095	Significant	Reject Ho
Leading and Managing Change and Teamwork	0.433057865	0.19	0.095	Significant	Reject Ho
Leading and Managing Change and Efficiency	-0.514865287	0.27	0.095	Significant	Reject Ho
Leading and Managing Change and Quality	0.857639155	0.74	0.095	Significant	Reject Ho

Table 11 presents the Pearson r Correlation for Leadership Capability in terms of Leading and Performance Competency particularly Managing Change of school administrators in the Fourth Congressional District of the Division of Laguna as assessed by the public secondary school teachers.

For Leadership Capability in terms of Leading and Managing Change and Quality for Leadership Performance competency has the highest computed r-value is 0.74 equivalent to 74% greater than the critical value of 0.095 which implies a High Correlation thus the ***null hypothesis is rejected***. Next is Leadership Capability in terms of Leading and Managing Change and People Performance Management for Leadership Performance competency has the computed r-value is 0.85 equivalent to 73% greater than the critical value of 0.095 which implies High Correlation thus the ***null hypothesis is rejected***. Then, Leading and Managing Change and Leading People With the computed r-value of -0.71 equivalent to 52% greater than the critical value of 0.095 which implies High Correlation thus the null hypothesis is rejected. It was followed by Leading and Managing Change and Efficiency with the computer r value of -0.51 equivalent to 27% greater than the critical value of 0.095 which implies a High Correlation thus the ***null hypothesis is rejected.*** Next is Leading and Managing Change and Professionalism and ethics with the computed r-value of 0.44 equivalent to 20% greater than the critical value of 0.095 which implies Moderate Correlation thus the ***null hypothesis is also rejected***. For Leading and Managing Change and Teamwork with the computed r-value of 0.43 equivalent to 19% greater than the critical value of 0.095 which implies Moderate Correlation thus the null hypothesis is rejected. And then for Leading and Managing Change and Innovation with the computed r-value of -0.41 equivalent to 17% still greater than the critical value of 0.095 which also implies Moderate Correlation, and the ***null hypothesis is rejected***. Lastly for Leading and Managing Change and People Development -0.01 is equivalent to 0.00% lesser than the critical value of 0.095 which implies No Correlation thus ***the null hypothesis is accepted.***

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of the study, the following conclusions and recommendations are made:

The assessment of the selected public secondary school teachers on the leadership capabilities of their administrators has a significant relationship with the performance competencies of their administrators, hence the null hypothesis was rejected.

Administrators of the Public Secondary Schools from the Fourth Congressional District of the Division of Laguna may encourage students to pursue and finish their graduate studies for their professional growth.

Encourage teachers to join different programs aside from DepEd initiated programs for professional development of teachers like joining research festivals, attendance to short courses, seminars, and pieces of training, and other professional opportunities. Evaluate and equip employees with the necessary learning and development (as well as any other tools and support) to complete their tasks and reach their full potential.

School principals should include different strategies for a long-term mentoring and coaching procedure to assist teachers, especially the newly hired teachers.

The Department head must be open to the suggestions of teachers under him/her to effectively derive the consensus of the teachers and come up with a better decision. Regularly hold open and honest two-way dialogues about performance; consistently, equally, and fairly evaluate employee performance; and provide constructive and respectful feedback on how employees are performing. Ensure that developmental programs for aspiring school leaders' attention to encouraging participants to develop strategies for balancing work and other aspects of their lives; more opportunities for team members to experience professional development as a team - one version of this would include the chair of the governing body. By leading by example and modeling the correct attitudes and actions, you may create a great workplace culture.

Also, scholarship grants should be provided to willing teachers so that many can pursue their graduate studies. Even the teacher's organization with the initiative of the officers may propose financial assistance to those teachers who are very much

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willing to attend different seminars and training to improve their teaching skills.

A similar study should be conducted to verify the result of the study.

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HEAT TREATMENT OF MEDIUM CARBON STEELS AND ANALYSE ITS PROPERTIES USING MODIFIED U.T.M

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ABSTRACT

This project report aims to study and calculate two of the most fundamental properties of a metal – it's Young's Modulus of Elasticity and hardness. For this experiment, the metal chosen was Steel on which different heat treatment and hardening processes were conducted. Hardness test helps in measuring the resistance of a material to plastic deformation on indentation.Hardness is a feature of a given object, and not a basic physical property. The hardness values can be calculated on three different scales which helps in giving a better idea and precision about the material's hardness.

The Young's modulus of a material is an important attribute to understand for analyzing how the material will behave when the force is applied. In this experiment, the Young's Modulus was found out by the application of Euler's Buckling Formula. Buckling is the loss of stability that occurs when the applied compressive loads exceed a certain value causing the shape of the bar to change. The variables are calculated using the Universal Testing Machine (UTM), which are then substituted to find Young's Modulus for different cases. The experimental values shows that the young's modulus of heat treated steels don't vary much.

1. INTRODUCTION

The demand for modern and complex engineering structures which are durable for longer periods of time are increasing day by day. Hence, material selection becomes one of the most important fac- tors. Cost effectiveness also comes into play dur-ing selection of materials. Several variations of the same metal/material are used for different applica- tions. These variations arise with change in the mi- crostructure of metals which is achieved by differ- ent heat treatment and hardening processes. Our project aims to compare the hardness and young's modulus of different "variations" of medium carbon steel – one of the very important materials used for several applications in today's world. The hardness test is a mechanical test for material properties whichare used in engineering design, analysis of structuresand material development. The hardness test is per- formed to determine the suitability of a material fora given application. The Rockwell hardness test is based on the measurement of the depth to which anindenter is forced by a heavy(major) load beyondthe depth resulting from a previously applied pre- liminary(minor) load.

Buckling is the loss of stability that occurs when the applied compressive loads exceed a certain valuecausing the shape of the bar to change. Its hap-pen when the load is applied axially and load is high enough. The deformation within the beam is perpendicular to the compressive force then it is known as buckling. In this experiment, we performedcoloumn buckling and used a monosymmetric speci- men(symmetric along the plane).

2.AIM

Comparing hardness and Young's Modulus of Elas- ticity of heat treated medium carbon steels.

3.THEORY

Heat Treatment is defined as the combination of heating and cooling operations applied to a metal in a solid state for a specific time in a way to get the de- sired properties. These properties are dependent on the microstructures of the alloys and the percentage composition of different phases present in that alloy, which depends on the change in alloy composition and the heat treatment. This is primarily conducted to either soften or harden the metal. The softening processes which include annealing and normalizing will increase the ductility and toughness of the ma- terial at the expense of the strength and hardness of the material. Whereas hardening processes which include quenching and tempering and age hardening increase the hardness and strength and decrease the ductility and toughness of the material. Annealing and normalizing refer to heating the material to the austenite temperature, soaking it at this tempera- ture, and then cooling it slowly in the furnace and the air respectively. Both these processes will give pearlite as the

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product which is a ductile and tough material however, they differ in their microstruc- tures. Annealed product has coarse lamella structure whereas normalized product has fine lamella struc- ture. Also, as the cooling rate in the normalizing process is faster it will produce harder material than the product formed in annealing.

Quenching and tempering are widely used heat treatment processes for getting highly hardened steel which includes the heating of material at approxi- mately 700oC - 1000oC to the austenitic range and then holding at this temperature for a time which de- pends on the dimensions of the material used. Then the material is quenched in water or oil to increase the cooling rate drastically which leads to the forma- tion of martensite, which is the hardest steel alloy. This structure will decrease the ductility and tough- ness of the material and to achieve the desired com- bination of properties in the material it is then tem-pered to soften the material again by heating. This will improve the toughness and ductility while main- taining a high strength level. Tempering includes the heating of quenched material again to a temperature below the austenitic temperature which will disasso- ciate the hard martensite to ferrite and iron carbide which is also known as tempered martensite in which cementite is dispersed in the matrix of ferrite.

The hardness of a material represents its resis- tance to abrasion, scratching, and cutting. In a hard- ness test, a defined force is mechanically applied to the specimen. Rockwell hardness tester presents a di- rect reading of hardness number on a dial provided with the machine. The loading of the specimen is done in two steps, initially, a minor load of 10kg is applied to a penetrator causing an indentation of di- ameter d1 in the test specimen. Application of a minor load eliminates backlash in load terrain and causes the indenter to break through surface rough- ness, contributing to accuracy in the test. With mi- nor load still operating major load is added according to the scale in which the hardness is to be measured. The application of a major load increases the depth of penetration. So, the values of the HRC scale for the annealed, normalized, quenched and tempered materials should follow the order of hardness as fol- low:

Annealed < Normalized < Tempered < Quenched

Column: long slender member subjected to an axial compressive force are called column. It’s a monosymmetric bar with uniform cross section along its length. Column which is perfectly straight called ideal column.
Column Buckling: when load is applied along the axis of bar and deformation happen perpendicular of the load then it is called column buckling.
Critical load(Pcr): smallest value of load at which bucking just begin to start within the column. There are three stage of column which in under axial com- pressive load :

1. Stable equilibrium: when applied load (P) is less than critical load ($P < P_{cr}$)
2. Neutral equilibrium:when applied load is equal to critical load ($P = P_{cr}$)
3. Unstable equilibrium: when applied load is more than critical load ($P > P_{cr}$)

In stable equilibrium stage bar will not fail, neu- tral equilibrium stage bar just begins to buckle(fail) and unstable equilibrium stage bar will fail. When axial load applied to a sample which is homogenous, linear, isotropic, elastic material then buckling hap- pens as sine wave(kind of). Euler’s Buckling formula is used to design column and other truss members

which are loaded in pure compression. Depending on end conditions there is factor K multiply with L, and it’s considered as Leff . Factor K show how much length get buckled.

$$P_{cr} = \frac{\pi^2 EI}{(KL)^2} \quad (1)$$

Slender columns are at a much greater risk of buckling than thick columns. If the load is applied at the centroid of the cross-section, then there is no displacement of the column until the critical load is reached when the displacement becomes very large.

4. MATERIALS

For performing the project, we used medium car- bon steel rod (%C: 0.4% - 0.6%) of dimension 1cm ×1.1cm× 100cm.As in order to form martensite during hardening at low %C is not possible. Rod was further cut into 5 equal pieces of dimension 1cm× 1.1cm 20cm each and heat treatment process was performed on it. For Rockwell Hardness Test, 1cm ×1.1cm× 2cm was further cut out from the 20cm specimen and buckling by uniaxial compressive test was performed using UTM on the remaining sample of dimension 1cm × 1.1cm × 18cm.

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Figure 1: samples for Rockwell hardness test

Medium Carbon Steels are mainly used for mak- ing shafts, axles, gears, crankshafts, couplings, and forgings. Some of them are also used for rails, rail- way wheels, and rail axles. Quenched and tempered steel is particularly useful in machinery and struc- tures where greater abrasion resistance and higher yield strength are necessary, such as mining, quarry- ing, earth moving, and construction.

5. MACHINE OVERVIEW

This test is performed on Rockwell hardness tester(model no. RASNE 1), a Universal Testing Machine (UTM) also known as universal tester and a muffle furnance.

5.1 Rockwell Hardness Test

The componants of rockwell hardness test are:

1. Observing LCD Display-Various parameter such as scale, dwell time, hardness reading value as well as HIGH/OK/LOW etc. display on this.
2. Anvil -It provides base where the workpiece will be placed.
3. Anvil handle-The handle facilitates vertical movement of anvil such that workpiece will come in contact with indenter
4. Indenter -Diamond indenter having depth an- gle of 120, used to make indentation on work- piece.
5. Load selector -A circular dial having load mark- ing, it allows one to set an appropriate inden- tation load to be set on workpiece.

Figure 2: Rockwell Hardness testing machine

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Preliminary Force	Intender	Scale
60*kgf*	Diamond 120^o	A
100*kgf*	Diamond 120^o	D
150*kgf*	Diamond 120^o	C

Table 1: Rockwell hardness testing machine specifica- tions

5.2 Muffle Furnance

Muffel furnaces are heat treating furnaces having high temperature alloy removable chambers which operate under protective atmosphere, the high qual- ity heat treating furnaces having the capability to operate at high temperatures of up to 1100oC with heating chamber dimension 300 300 450mm and we have performed heating at 850oC for time interval of 1hr.

5.3 Universal Testing Machine

Model no. of our UTM is UTE-20. It is electronic control machine. Its max load capacity is 200 KN. Some parts of this UTM are following:

1. Main hydraulic cylinder assembly –It consists of piston and cylinder. piston moves vertically up-down with the help of hydraulic mechanism. It is the base of UTM.
2. Main platen – Above the hydraulic cylinder as- sembly, there is thick plate base of compression section. It consists of two vertically main col- umn (without any threading).
3. screw column – There are two other vertical column which are threaded. These two rotate clockwise as well as anti-clockwise.
4. Cross heads – There are two cross heads. Lower and upper cross head. During tension and compression test lower cross head moves vertically up-down. Upper cross head fixed at higher end of main column. The lower cross head attached to the threaded column. In these cross heads there are jaws in middle these jaw holds specimen during uniaxial tensile test.
5. Controlling panel – It is electronic panel which control the hydraulic mechanism.

Figure 3: Universal Testing Machine in the lab

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5.3.1 Modifications

Figure 4: Modified part added in UTM

We performed buckling using this UTM with some modifications. There are two thick discs part in the UTM. One is threaded and other one has movable bush(kind of). We had a M14 bolt (from SM lab) of same size as of the threaded disc. That bolt is larger than required that's why we took 6 broken Charpy sample and using rubber band we attached 3-3 bro- ken sample in such a way (as seen in Fig.4). We use rubber band to ensure that these broken sample doesn't fall into jaw hole during installation of the bolt into jaw. After putting this bolt into the jaw, we tight that threaded disc at the lower face of lower cross head and tight jaw.

Figure 5: Specimen cap used to fix one end

We remove disc(which has removable bush) from the base of main platen. There is hole at below this disc, we placed a cap to ensure that lower end of our sample get fixed. We made that cap as we take a waste thread pipe of outer diameter 18mm and in- ner diameter 12.6mm. since inner diameter is not equal to our desired diameter 14.8mm. That's why we have to cut the cap along its axis and put it into the sample using a hammer Fig.5. Placed the sam- ple associated with cap in that hole. By this modifi- cation we made end condition that one end is fixed while the other end is a free joint.

6. PROCEDURE

1. Initially, we took medium Carbon Steel of di- mension 1.0cm× 1.1cm ×100cm. The sample (100cm length) was cut into 5 pieces of 20.0cm each.
2. Heat treatment process was carried out for 4 of the samples inside the muffle furnace at 850oC for 1 hour. The samples undergo different cool- ing process after being heat treated in the fur- nace. As we know that the microstructure changes if the cooling rate of the specimen is changed. These different processes can be cat- egorized in this way –

a) Normalising–One specimen is cooled in air.

b) Annealing –One specimen is cooled inside the furnace.
c) Quenching–Two samples are cooled by quenching it in water for 10 minutes.
d) Tempered –One of the quenched samples is reheated to 400oC for 45min and quenched in water.
3. As inside the furnace atmosphere is of air, a oxide ayer is developed on the surface of the sample. In order to avoid change in results hand grinding(face) is necessary.
4. After performing these processes, we cut 2.0 cm from all the specimens to perform Rockwell's hardness test.
a) Before performing the Rockwell Hardness test, the surface of the specimen is rubbed with emery paper(220) to make the sur- face smooth and avoid deflection in re- sults.
b) Select the desired scale and correspond- ing loads such as HRC (150kgf), HRD (100kgf).
c) Rotate the anvil handle in clockwise direc- tion such that indenter will come in con- tact with specimen and set preliminary load.
5. We take the remaining 18 cm of each speci- men and calculate its young's modulus by per- forming buckling test in the compression sec- tion of the Universal Testing Machine. In order to buckle the specimen by fixing one end and freeing the other end, we made some modifica- tions in the UTM.
6. Specimen is placed inside the cap to fix one end and held by the roller's of the UTM used in bending test in order to ensure that the load is applied in uniaxial direction only.
7. Parallelly, the critical load and displacement values are noted. When the load will remain constant and the displacement is changing will give the value of critical load for buckling. Us- ing the Euler's equation for bucking we can find young's modulus of elasticity for different sam- ples.

7.RESULTS

Sr. no	Scale	Load(L) Applied (in *kgf*)	Minor Load	Specimen	Avg Rockwell hardness number
1	HRC	150	10	Medium Carbon Steel	29.867(ok)
2				Annealed Steel	24.67(ok)
3				Normalised Steel	31.83(ok)
4				Tempered Steel	54.46(ok)
5				Quenched Steel	63.83(ok)
6	HRD	100	10	Medium Carbon Steel	28.6(ok)
7				Annealed Steel	26.57(ok)
8				Normalised Steel	32.17(ok)
9				Tempered Steel	59.07(ok)
10				Quenched Steel	64.1(ok)

Table 2: Results of the Hardness Experiments

Specimen	Critical Load(in kN)	Young's modulus(in GPa)
Medium carbon steel	35.3	183.7-240
Annealed Steel	30.5	158.7-207.3
Normalised Steel	35.5	184.8-241
Tempered Steel	38.4	199.9-261.0
Quenched Steel	38.9	202.5-264.4

Table 3: Results of Buckling test

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8.CALCULATIONS

Euler's Formula for buckling

$$P_{cr} = \frac{\pi^2 EI}{(KL)^2} \quad (2)$$

Where-
E= Young's modulus
I= Area moment
L= Original length(15.5cm)
K= 1.4-1.6

1. *Medium Carbon Steel*
   P_{cr} = 35.3kN
   for K= 1.4 we will get E_{min} = 183.7GPa
   for K= 1.6 we will get E_{max} = 240GPa
   Hence, Young modulus of normal steel will range from (183.7 to 240.0)GPa

2. *Annealed Steel*
   P_{cr} = 30.5kN
   for K= 1.4 we will get E_{min} = 158.7GPa
   for K= 1.6 we will get E_{max} = 207.3GPa
   Hence, Young modulus of annealed steel will range from (158.7 to 207.3)GPa

3. *Normalised Steel*
   P_{cr} = 35.5kN
   for K= 1.4 we will get E_{min} = 184.8GPa
   for K= 1.6 we will get E_{max} = 241.3GPa

   Hence, Young modulus of normalised steel will range from (184.8 to 241.3)GPa

4. *Tempered Steel*
   P_{cr} = 38.4kN
   for K= 1.4 we will get E_{min} = 199.9GPa

9. DISCUSSION

The hardness test is a mechanical test for material properties which are used in engineering design, anal- ysis of structures and material development. The hardness test is performed to determine the suitabil- ity of a material for a given application.The hard- ness of a material represents its resistance to abra- sion, scratching, and cutting. This implies the move- ment of dislocation should be highly prohibited, for obtaining greater hardness. The hardness test was perfomed on the five samples: annealed, normalised, medium carbon steel, quenched and tempered us- ing the Rockwell hardness test. From the tests con- ducted we could observe the annealed to be the least hard and quenched to be hardest. The hardness property of a material changes on heat treatment. The annealed sample is allowed to cool within fur- nace, this is a slow cooling process. The slow cool- ing process facilitates higher growth rate of nucleus than the nucleation rate. Because of this we ob- serve coarse grained structures. In case of normalised sample, the heated sample is cooled in air, which comparatively a fast cooling process than anneal- ing. The fast cooling process facilitates higher nu- cleation rate than the growth rate, hence more nu- cleus is formed and fine grained structures are ob- served. Fine grained structures have closely packed grain boundaries due to which the movement of dislo- cation gets hindered. The dislocations comes across the grain boundaries in its close vicinity which highly prohibits the motion. Since the movement of dislo- cation is key reason for hardness, that is greater the hardness greater the resistance of dislocation move- ment and vice versa. Hence, annealed steel is less hard than normalised steel. Medium carbon steel has an intermideate carbon structure between annealed and normalised, hence it has hardness between an- nealed and normalised samples.

In case of quenched material, rapid cooling is done, the carbon gets into the interstitial position of the ferrite which forms the metastable martensite, which hinders the movement of dislocation. During tempering, the prevalent unstable martensite precipitates out the carbide particles into the ferrite ma- trix solution. Hence, the hinderance caused by the presence of carbide gets relieved and the hardness de- creases and ductility increases. Therefore, we can in- fer that quenched is harder than tempered steel. We could finally conclude that changing the microstruc- ture highly contributes to the hardness of the mate- rial.

There are many applications in which column and bar are under high compressive load, due to this high compressive load, bar (I section, C section etc) and column get deformed perpendicular to the axial ap- plied load. These phenomena are observed in warp- ing the railway lines, beam of building, rack column, bridge beams etc. Buckling happens due internal moment generated within the structure due to axial compressive load. The material property associated with Buckling is young's modulus. Material with more young's modulus that can bear more compres- sive load. In aircraft's structure there is a failure which is called crippling failure. Buckling occurs before this failure. For elastic material there are two regions of buckling failure, elastic region and plastic region. When buckling failure is in elastic region, structure come back in its original shape but when it is in plastic region, structure won't come back in its original shape and size. We performed buck- ling test using uniaxial compressive load. We have conducted this experiment on different heat-treated samples of medium carbon steel(like annealed, nor- malized, quenched, and tempered). In the

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modifi- cation we made on UTM, we try to fix lower end and free upper end, but due to some tolerance in cap's outer diameter and hole diameter the lower end is not completely fixed similarly, between the upper end and disc there will be friction due to which the upper end is fully free. Due to tolerance, we use value of factor K = 1.4 1.6 to calculate the value of young's modulus. The indication of critical load in UTM is when critical load achieved that load change negligibly and displacement will change as usual due to buckling happens (as we see in load-displacement graph Fig.7).

This indication will depend on material as well as region of failure (elastic or inelastic). In the tem- pered sample buckling happens and when we un- loaded it sample came back in its original shape (al- most) it means buckling failure was in elastic region. Since tempered sample has high young's modulus and it remains ductile, due to this it is elastic region will be more in load-displacement curve (for tensile test).

Quenched sample has broken during experiment because of quenching sample gets brittle and due to hand grinding of surface, due to this process, there might be a developed crack, during compres- sive loading the cracks propagated and material failure happen in arbitrary manner. Rest of the sam- ple have gone to plastic region due to human er- ror in performing experiments. That is why we got that kind of shape after unloading (as we see in Fig.6). For the calculation, we assume that all samples are homogeneous, linear, isotropic, elastic material. Young's modulus depends slightly on mi- crostructure morphology of material [1]. Since we have done heat treatment on medium carbon steel which led to change the microstructure of the sam- ple so young's modulus will be change. Value which we got in experiment it shows young's modulus will be highest for quenched sample and lowest for an- nealed sample. We need this test to find out young's modulus because all time we do not have such sce- nario in which structure fail due to tensile load some time failure happens due to compressive load, that's why it is also important as tensile test.

Figure 6: Sample's after buckling test

9.1. Graphs

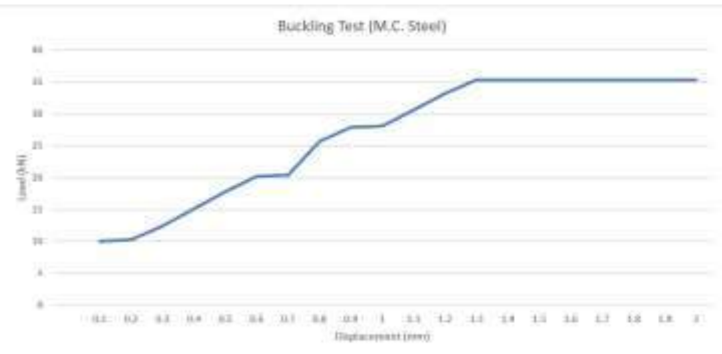

Figure 7: ***Load v/s displacement of medium carbon steel***

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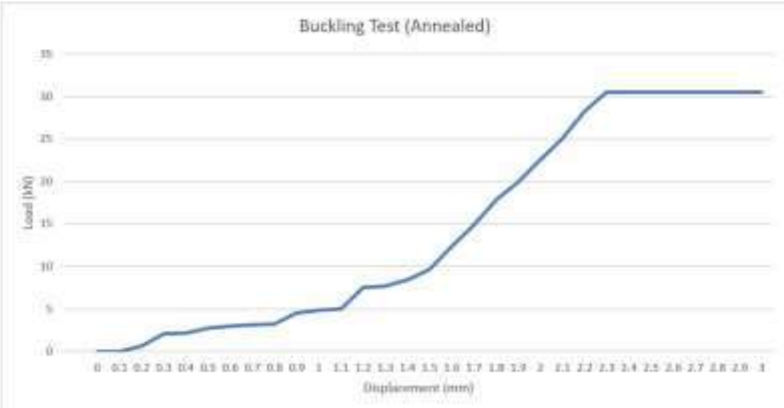

Figure 8: ***Load v/s displacement of annealed steel***

Figure 9: ***Load v/s displacement of normalized steel***

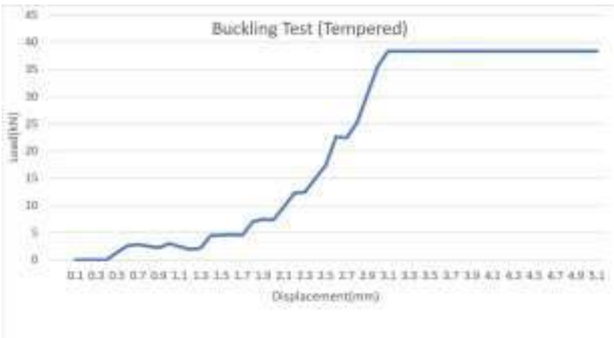

Figure 10: ***Load v/s displacement of tempered steel***

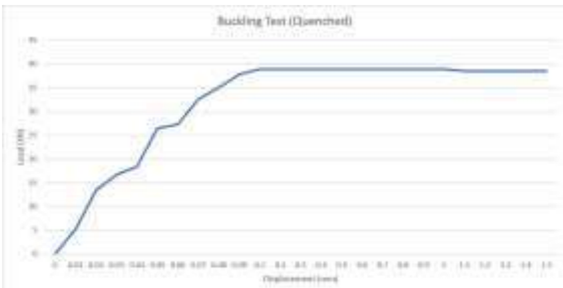

Figure 11: ***Load v/s displacement of quenched steel***

10.PRECAUTIONS

10.1. Sources of Error

1. human error: Error in measurement of dimen- sion of sample and experiment performing.
2. Machine error: Machine has some fluctuation that's why there will be error in critical load value.
3. Load is not perfectly axial that is why there will be some error in area moment of inertia.
4. There is not perfect end condition that's why factor K also vary from our considered range (1.4 − 1.6).

10.2 Precautions for Hardness test

1. Before testing for the sample, make sure the samples are polished using the emery paper to make sure the surface is flat and free of oxide layers.
2. It is important to reset the settings before test- ing each material. Failure to do so can affect the hardness values and the machine too.
3. The indentor is subject to multiple tests, which leads to wear and tear, because of this the in- dentor angle change and adversely affect the hardness values.

10.3 Precautions for Buckling Test

1. Take strip at place of bar to make sample buckle at lower load and better accuracy.
2. Take axisymmetric sample and a little bit lengthy sample for easier calculation and per- fect buckling.
3. Be careful when you perform buckling on quenched sample. Since it becomes brittle, it will break during the experiment.
4. Take measurement accurately and calculate the young's modulus.

11.CONCLUSION

From the results obtained from the conducted ex- periment we can interfer that the hardness of the heat-treated medium carbon steel samples is as fol- lows:
Annealed < Normalised < Tempered < Quenched
From the buckling test conducted on the UTM machine, the order of young's modulus is as follows:
Annealed < Normalised < Tempered < Quenched

This order is for our experiment only. Prior there is no theoretical backgroud whether young's modu- lus increases or decreases as we go from annealed to quenched samples. Young's modulus depends slightly on microstructure change and will slightly change as we observed in our experimented value. This project gives a good hand-on experience on dif- ferent machines.

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THE ESTABLISHMENT OF THE BUKHARA KHANATE AND THE SHAIBANI DYNASTY

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ABSTRACT
This article shows the social, political and economic situation of Mavorunnahr at the end of the 15th century and the beginning of the 16th century, the decline of the Timurid dynasty and the factors that caused Shaibani Khan to march to Mavorunnahr. Shaibani Khan's founding of the state and the subsequent name of this state as the Bukhara Khanate, as well as the activities of the Shaibani rulers, are covered.
KEY WORDS: *Mavorunnahr, Timurids , Shaybani Khan and Shaybani rulers, Safavids, Bukhara Khanate, socio-economic reforms of the rulers.*

INTRODUCTION

Today, in the process of reforms implemented in all aspects of the socio-political, cultural and spiritual life of independent Uzbekistan, the role of the science of history in fulfilling the tasks of educating members of society who have free thinking and are instilled in the mind and heart of the national idea has seriously increased. is going Speaking about history, as President Sh.M. Mirziyoyev said, "... we have a great enviable history. We have great ancestors who are worthy of envy. We have immeasurable riches to covet. And I believe, God willing, we will have a great enviable future."[1] About history, our first president, the late IAKarimov, "...is becoming a real educator of the nation." The actions and courage of our great ancestors are reviving our historical memory and forming a new civic consciousness [2]. " The state founded by Amir Temur, known as Sahibqiran in historical sources, in Mavorounnahr [3], turned into disarray in the second half of the 15th century as a result of the struggles of the Timurids for the throne. This situation led to the march of the Dashti Kipchak rulers to Mavorounnahr. On the one hand, since the main goal of the people of Dashti Kipchak was to transition to a sedentary lifestyle , Movorunnahr was the most convenient place for their goals, and on the other hand, Shaibani Khan organized marches to Movorunnahr because the goal was to end the rule of the Timurids. To realize this goal, Shaibani Khan started a military campaign to Movarounnahr. Shaibani Khan left the battle method, which confused his opponents during this campaign - tolga. During this period, the struggle for the throne between the Timurids reached its climax in Movorounnahr, and the country was completely mired in chaos. For this reason, even the fact that the local population wanted the establishment of a state based on strong governance under the leadership of Shaibani Khan made Shaibani Khan's campaigns easier on the one hand. One by one, Movoroonnahr cities were occupied by Shaibani Khan. He fought for several years , and with the help of the rulers in Tashkent, he firmly established himself in Dashti Kipchak. Later, after the capture of Sayram and Yassini , the governor of all of Turkestan won the yat. In 1498, after the death of Sultan Akhmad Mirza, he marched to Samarkand, when he failed to capture it, he marched to Qarshi and looted together with Shahrisabz. In 1500, Muhammad Shaibani Khan again marched to Samarkand and conquered it and plundered it for four months. This caused the Samarkand people to revolt against Shaibani Khan, and they raised the 19-year-old Timurid prince - Zakhriddin Muhammad Babur as Khan. Babur also captured Karshi and Guzor. However, the situation of the people who had been robbed for a long time was very poor. Babur's troops, who were in a difficult situation, were defeated by Shaybani Khan on the banks of Zarafshan, and after being surrounded, they had to secretly retreat to Tashkent.[4] Muhammad Shaybani Khan, who had a large army, now began to occupy the whole of Movarounnahr. In 1503, the cities of Tashkent and Shahrukhiya were occupied. Shaybani Khan appointed his uncle Kochkunchi Sultan, who were the sons of Ulughbek Mirza's daughter Rabiya Sultanbegim , to Turkestan, and his brother Suyunchhoja Sultan to Tashkent, and his brother

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[3]the time when Venus and Mushtari or Venus and Sun collide at a certain level of the ecliptic period (Qiran) . An explanatory dictionary of the Uzbek language. "National Encyclopedia of Uzbekistan", Tashkent
[4]History of Uzbekistan. - T., 1993. - S. 33–34.

Mahmud Sultan to Bukhara provinces. 1504 Ferghana Valley was captured . Jonibek, the son of his uncle, who participated most actively in Shaibani Khan's military campaigns , brought Akhsi and Andijan to the Sultan. Another son of Jonibek Sultan Abulhairkhan was the son of Khoja Mahmud Sultan. In this way, the rule of Shaybani dynasty was established in Movarounnahr. The city of Samarkand was designated as the capital. In 1505 , the land of Khorezm was conquered. From 1505, marches were made to the territories of Khurasan, and the main cities, the city of Balkh, were captured in 1506, and the capital, Herat, in 1507. It was not difficult for the Timurids, who faced a crisis due to internal conflicts in recent years, to occupy the state of Khurasan . After the conquest of Herat in 1507, Astrobad and Jurjan were also conquered, and the lands from the Caspian to China, from the foot of the Syr Darya to the central regions of Afghanistan came under the rule of Muhammad Shahbakht Shaibani Khan. With the establishment of Shaybani Khan's rule, the long-lasting disputes between the Timurids in Movarounnahr were put to an end and peace was established. With the establishment of a politically centralized state, Shaibani Khan gained great respect for his inclination to science and literature, respect and patronage of representatives of this field. With the subjugation of Khurasan, Muhammad Shaibani Khan was able to unite the entire region under a single center - Samarkand. Consequently, he was able to do what Timurids could not do. This is his service to our state. In this way , the rule of Muhammad Shaybani Khan was established in the territory including Movarounnahr, Khorezm and Khorasan, and the era of the rule of the Shaybani dynasty began in the history of our statehood. Khurasan and Movoroonnahr will be united under a single ruler. This state was later called the Khanate of Bukhara. There were wars with the Iranian Safavid state, which was the main opponent of Shaibani Khan in this period . The Battle of Marv took place on December 4, 1510, between the Shaibani army led by Muhammad Shaybani Khan and the army of the Safavid king Ismail I Safavi of Iran, near the village of Mahmudabad near Marv. There were about 40,000 warriors in Shah Ismail's army, and 20,000 soldiers in Shaybani Khan 's army . According to Ibn Ruzbekhan's information, Shaibani Khan sent back the main part of his army in 1509. With this, it is possible that he intended to maintain political stability in Movarounnahr and prevent new invasions of Kazakh sultans. All the Uzbek sultans (emirs) and Shaybani Khan died [5]in a fierce and bloody battle . After his death, Ismail I Safavi, the ruler of the Safavids, who had weakened the state, took over Movorounnahr and appointed the Timurid prince Zahiriddin Muhammad Babur as his viceroy. But in 1512, in the battle of Gijdivan, Ubaydullah Khan defeated the army of Shaybani and expelled them from Movorounnahr. There was a custom among the Shaybanites that the throne was not passed from father to son, but the oldest representative of the dynasty was appointed as the heir to the throne. After the death of Shaibani Khan, his uncle Kochkunchi Khan took the throne and ruled in 1512-1530. Although he officially ruled the country for 20 years , due to some contradictions within the dynasty, the Shaibanis could not conduct a strict internal and foreign policy as in the time of Muhammad Shaibani Khan. [6]It was during the period of Kuchkunchikhan that the independence of the sultans increased, and among them Ubaidulla Sultan, the ruler of the Bukhara estate, had a very high reputation. After that, his son Abu Said took the throne, and during his short reign, the central authority weakened in Movarunnahr and Khorasan, and conflicts between the emirs and sultans intensified. At this time, Khorezm became an independent state , and the lands of Turkestan began to disintegrate until 1533. Samarkand was considered the capital of the state during the reign of Shaibani Khan, Kochkunchi Khan, and Abu Said. But when Ubydullah Khan took the throne, he moved the state center to the city of Bukhara. Because Bukhara became Ubaidullah Khan's ancestral property . When Shaibani Khan was dividing the cities of Movorunnahr among his relatives, he gave Bukhara and its surroundings to his brother Mahmud Sultan. Abdulla Sultan, the son of Kuchkunchikhan, who was the ruler of Samarkand, was also forced to recognize the authority of Ubaidullah Khan. Thus, the state of Bukhara Khanate was established. Ubaydullah Khan ruled in 1533-1540. Ubaydullah Khan's services in our history are great. First of all, he avoided the attacks of Ismail Safavi and saved Mowarounnahr from their military and political oppression. During the reign of Ubaydullah Khan, the influence of Bukhara as a capital city grew in every way . Ubaidullah Khan tried to restore the borders of his state to the borders of Shaibani Khan's time. In 1537-1538, he marched to Khorezm and occupied it. He defeated [7]the Iranian army that occupied Herat several times . At the same time, he put an end to internal strife and disunity in the country.

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EFFICACY OF AUGMENTED BIOFEEDBACK TRAINING WITH CUSTOMARY PHYSICAL THERAPY ON HAND FUNCTION IN IMPROVING VISUAL MOTORINTEGRATION SKILLS IN SPASTIC CEREBRAL PALSY CHILDREN

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ABSTRACT
BACKGROUND: *Cerebral palsy (CP) is a disorder of movement and posture which is non-progressive in nature, originates from the neural lesions (with static nature of brain injury) during perinatal period occurred during fetal or developing brain and associated with activity limitation and wide range of comorbidities which makes the child's life difficult even when performing his ADL . In other words, as nervous system is structurally disordered, the normal flexibility and plasticity is impaired resulting in restriction of range of motor patterns, finally resulting in weaker motor performance and stereotyped and impaired functionality. The motor disorders of CP are often associated with sensory, perceptual, cognitive, feeding, communication, epilepsy, behavioral issues and also with secondary musculoskeletal impairments. It is the common disability of childhood (during which brain has got maximum potential for reorganization and plasticity) with the prevalence of 2.1 per 1000 in high income countries and prevalence can go up to 8-40 % in high risk population like EP babies, whereas data from countries with low to mid socio-economic status is not available.*

OBJECTIVE: *The objective of the study is to investigate the efficacy of combining Augmented biofeedback with customary physical therapy for improving visual-motor integration skills in children with spastic cerebral palsy*

METHOD: *Participants were 20 subjects, 7-13 years of age, with spastic CP were selected according to the inclusion criteria. They received both augmented biofeedback training andcustomary physical therapy for a treatment duration of 10 weeks and undergone pre and post test of Developmental Test of Visual Perception-2(DTVP) Scale and Bruininks-oseretsky Test (BOT-2) Scale. andManual Ability Classification System (MACS)Scale.*

RESULT: *The statistical analysis revealed thatthe subjects have showed significant changes in visual motor integration skills after the intervention applied.*

CONCLUSION: *Results of the study provide useful evidence supporting the possibility of combined effects of augmented biofeedback training with customary physical therapy for subjects with spastic cerebral palsy.*

KEY WORDS: *Spastic cerebral palsy, visual-motor integration, Augmented biofeedback training, Developmental Test of Visual Perception-2 and Bruininks-Oseretsky test-2*

INTRODUCTION
Cerebral palsy (CP) is an umbrella term covering a group of non-progressive but often changing motor impairment syndrome that may or may not involve sensory deficits that are caused by a non-progressive defect lesion oranomaly of the developing brain.

CP is a primary disorder in the building up of the patterned structure of the movement which results in a limitation of the freedom of choice of movement and posture. In other words, as nervous system is structurally disordered, the normal flexibility and plasticity is impaired resulting in restriction of range of motor patterns, finally resulting in weaker motor performance and stereotyped and impaired functionality.

The motor disorders of CP are often associated with sensory, perceptual, cognitive, feeding, communication, epilepsy, behavioral issues and also with secondary musculoskeletal impairments. It is the most common motor disability in childhood. The etiology of cerebral palsy is very diverse and multifactorial. The causes are congenital, genetic, inflammatory, infectious, anoxic, traumatic and metabolic. The injury to the developing brain may be prenatal, natal or post-natal.

According to WHO, in India3.8% of population has some form of disability due to different causes. The cerebral palsy is classified on the basis of muscle tone (spastic, dyskinetic, ataxic and mixed) and on the basis of number of distribution of the affected limb (monoplegia, diplegia, hemiplegia, tetraplegia and quadriplegia).

Spastic Cerebral palsy(SCP) is the most common type. It's about 77.45%.The increase of spastic CP is predominantly a Result of higher survival rates for very small premature babies. Spasticity can cause secondary disorders such as hip dislocation, scoliosis, knee contractures and torsional malalignment of the femur and tibia. These changes often have significant effects on function, including effortful gait pattern, difficulty assuming and sustaining seated positioning and difficulty performing self-care activities such as toileting, bathing, dressing and self-feeding.

The signs and symptoms of cerebral palsy may be apparent in early infancy. Infants presenting with abnormal muscle tone, atypical posture and movement with persistence of primitive reflexes may be diagnosed earlier than 2 years of age. Evaluation of the child's motor skills, neuroimaging and evidence that symptoms are not progressing are key elements of this diagnosis. Neuroimaging of the brain, such as cranial ultrasound, computed tomography and magnetic resonance imaging can show the location and type of brain damage.

Cerebral hemorrhages may be associated with cerebral palsy. These hemorrhages are labeled as intraventricular hemorrhage, bleeding into the ventricles, germinal matrix hemorrhage, bleeding into the tissue around the ventricles and periventricular hemorrhage bleeding into both areas. Hemorrhages are graded in increasing severity from 1 through 4. The grade of bleed along cannot predict the development of severity of cerebral palsy:

RELEVANT ANATOMY: The brain is composed of cerebrum, cerebellum, and the brainstem. Cerebrum is the largest part of the brain and is composed of right and left hemispheres. It performs higher functions like interpreting touch, vision, and hearing as well as speech, reasoning, emotions, learning and fine control of movement. Cerebellum is located under the cerebrum. Its function is to coordinate muscles movement, maintain posture and balance. Brainstem acts as a relay center connecting the cerebrum and cerebellum to the spinal cord. The cerebral hemisphere has distinct fissures which divide the brain into 4 lobes: frontal, temporal, parietal and occipital. The surface of the cerebrum is called the cortex. The blood supply is carried to the brain by two paired arteries: the internal carotid arteries and the vertebral arteries. The internal carotid artery supply most of the cerebrum and the vertebral artery supply to cerebellum and brainstem:

PATHOPHYSIOLOGY OF SPASTICITY

Spasticity is a motor disorder characterized by velocity-dependent increase in tonic stretch reflexes with exaggerated tendon jerks resulting from hyper excitability of stretch reflex. Spasticity is classified to:

- Intrinsic Tonic spasticity: exaggeration of tonic component of stretch reflex
- Intrinsic Phasic spasticity: exaggeration of phasic component of stretch reflex
- Extrinsic spasticity: exaggeration of extrinsic flexion or extension spinal reflexes

Afferent input from internal organ, the musculoskeletal afferent input from internal organs, the musculoskeletal system and the skin converge on the medulla spinalis, activates the stretch reflex. The same afferent information goes to the cerebellum and the somatosensory cortex. It is processed in centers of basal ganglia as well. The resulting motor response is relayed to the lower motor neuron through the pyramidal and extra pyramidal system tracts.Spasticity arises from prolonged inhibition of spinal reflexes as a result of UMN lesion. These spinal reflexes include stretch, flexor and extensor reflexes and are under supraspinal control by inhibitory andexcitatory descending pathways. Stretch reflexes are proprioceptive reflexes and are either phasic or tonic. The tonic stretch reflex arises from a sustained muscle stretch and is the cause of spasticity. It occurs only when the lesion involves pre-motor and supplementary motor areas.

SYMPTOMS OF SPASTICITY: Mild muscle stiffness to severe painful muscle spasms, Muscle over activity, Flexor, and extensor spasm, Hyper reflexia, clonus, Extensor plantar response
The modified Ashworth scale is the widely used assessment tool to measure resistance to limb movement. Its scores exhibit better reliability when measuring upper extremity than lower extremity. The physical therapy management for spasticity include stretching, splinting, postural management, strengthening exercises and physical modalities.

TREATMENT: Biofeedback is an alternative medicine approach that teaches people to change the way their bodies function. It is a mind body therapy that may improve our physical and mental health. It can improve motor outcomes for people with CP. If given too frequently, biofeedback may prevent from learning autonomously. Consistent and concurrent feedback is used to improve specific motor activities.

Customary physical therapy is defined as the treatment of movement disorders caused by impairments of joints and the muscle that move the joints. Mobilization, strengthening and stretching constitute the three main treatment approaches in conventional physical therapy.

VISUAL MOTOR INTEGRATION

Visual motor integration (VMI) is a complex skill set which encompasses many underlying skills such as visual perception, motor control and eye-hand coordination.

It refers to the ability to translate a visual image, or a visual plan into an accurate motor action. VMI involves visual perception skills-the ability to correctly perceive a form in order to correctly replicate it. Examples are;
Correctly perceiving and copying shapes,correctlyperceiving, and copying letters and numbers.

MATERIALS AND METHODOLOGY

This study was Quasi Experimental design- pre and post nature, has conducted at Cherraans Institute of Health Science- Out patient department, Coimbatore and Jeyam’s special school, Coimbatore, the study population was pediatricpopulation, and the target Population was Spastic Cerebral Palsy children, The sample size has 20 subjects who fulfilled the inclusion and exclusion criteria asConvenient sampling method the subject has selected and underwent 10 weeks of treatment.

INCLUSION CRITERIA: Age of 7-13years,both genders were selected,Spastic cerebral palsy children’s diagnosed by Neurologists (spasticity score of 1, 1+ and 2 according to modified Ashworth scale, Ability to understand verbal commands,Children’s without assistive device

EXCLUSION CRITERIA: Children’s with any neurodegenerative diseases, Children’s with traumatic brain injury
Children’s with visual and hearing impairments, Children’s with musculoskeletal injuries,

7-13years old children’swas selected. Informed consent was taken from the selected children’s parents and the basic instructions were given to the children’s. The following exclusion was above 13years and disagreement to participate in the study.

Both augmented biofeedback training and the conventional physical therapy were received to the subjects’ for the hand functions. The conventional physical therapy included exercise like grasping objects like ball by stretching arms while sitting with the trunk perpendicular to the floor. The idea is to maintain the body’s centerline, grasp objects by stretching arms while breaking away from the centerline, return back to the original position. Gentle stretching and strengthening of upper limb.

The biofeedback training included basic exercise involved movements of hand. Exercise based on program, forexample, hitting targets using one or both hands while sitting in a posture, taking account of the engagement and movement of subject, moving in direction according to instructions, discerning pictures, reach out activities and hand movements.

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Assessments were conducted to identify changes in visual motor integration skills (VMI). The DTVP-2 and BOT-2 was used specificallyto assess the changes. The DTVP-2 was used to assess the visual perception function related to visual motor integration. The BOT-2 was used to assess the motor function of visual motor integration.

The treatment duration lasted for 10 weeks, 60 minutes per day and 3 sessions per week. During the treatment if the examiner feels like the subject is either not cooperating or getting tired, the examiner is advised to give some rest to the subject.
Relevant medical records and history is taken for each subject. All data is stored on separate hard drive, keeping it confidential and will be discarded once the study has been completed as per the policies of the University and the Institutions. Data gathered will be analyzed using statistical software.

Table 1:Characteristics of participants(N=20).

Sl.No	Characteristics	N
1	GENDER Male Female	 10 10
2	DOMINANT HAND Right Left	 20 0

Table 2: Age Distribution

Sl. No	Age Distribution	Frequency	Percentage
1	>9	4	20
2	9-11	11	55
3	<11	5	25

Graph 1: Graphical representation of age distribution

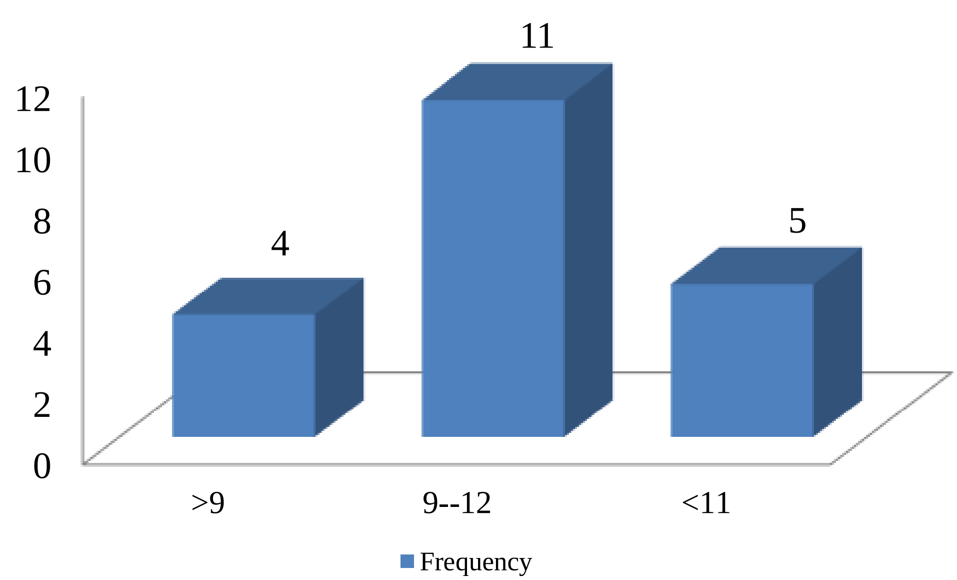


Table 2: Pre-post scores in DTVP-2

Sl. No	Variable	Pre	Post	p-value
1	Eye-hand coordination(EHC)	9.65±1.18	10.90±1.33	<0.00008
2	Copying(CO)	9.75±1.52	10.85±1.63	<0.00014
3	Figure ground(FG)	9.75±1.16	10.90±1.17	<0.00008
4	Visual closure(VC)	9.85±1.76	10.90±1.59	<0.00014
5	Form constancy(FC)	9.95±1.54	11.05±1.54	<0.00008

Graph 1: Graphical display of pre and post DTVP-2 assessment

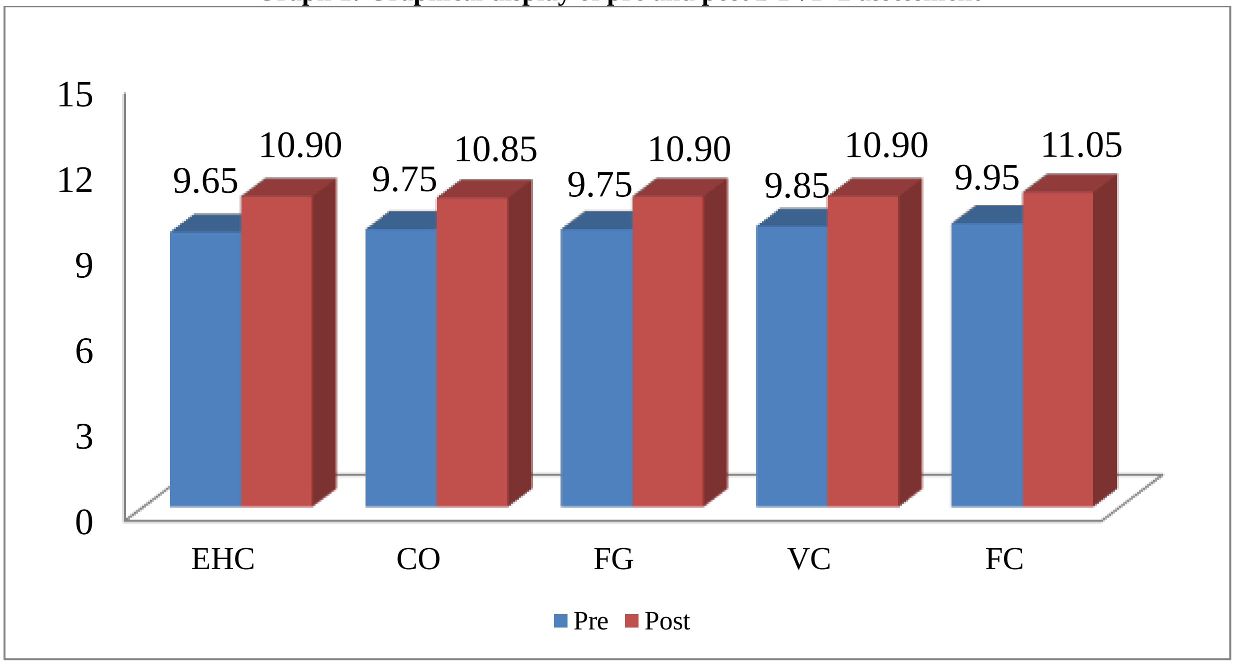


Table 3: Pre-post scores of BOT-2

Sl. No	Variable	Pre	Post	p-value
1	Fine motor precision(FMP)	14.35±3.12	15.55±2.98	<0.00008
2	Upper limb coordination(ULC)	13.40±3.82	14.50±3.69	<0.00008
3	Balance	12.10±3.09	13.15±3.08	<0.00008
4	Strength and Agility	10.55±3.20	11.65±3.07	<0.00008

Graph 2: Graphical display of pre and post BOT-2 assessment

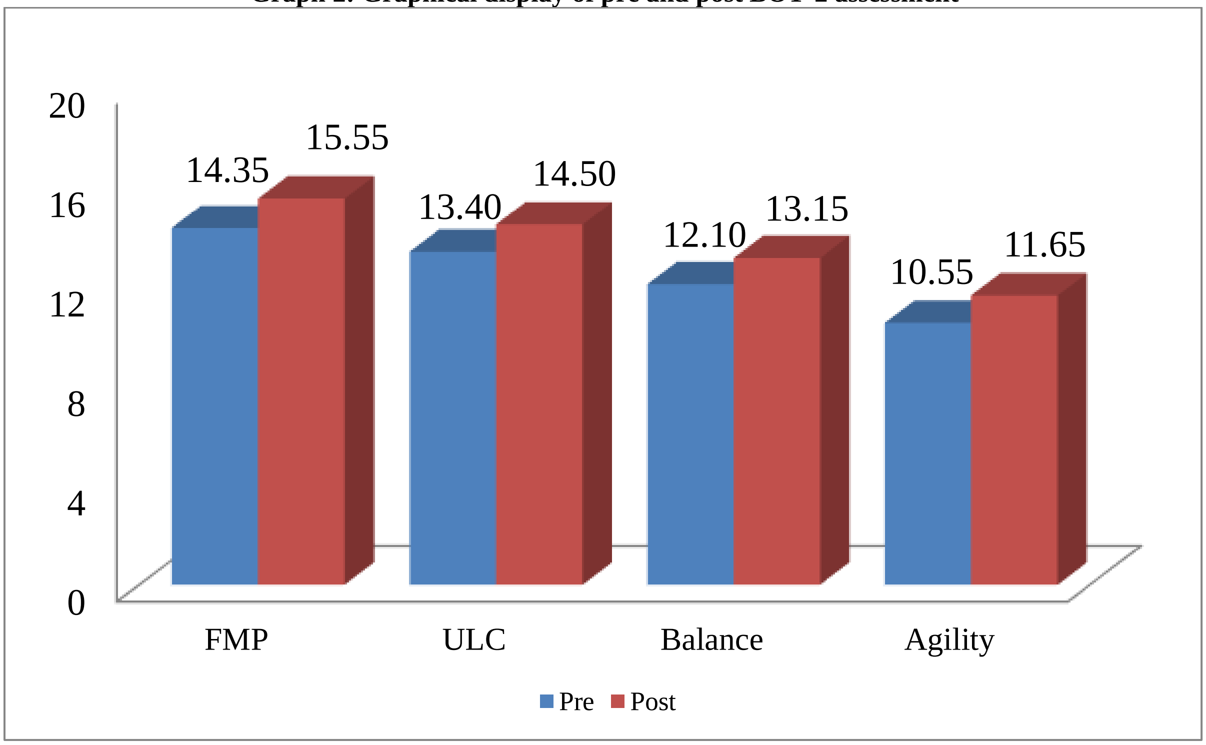
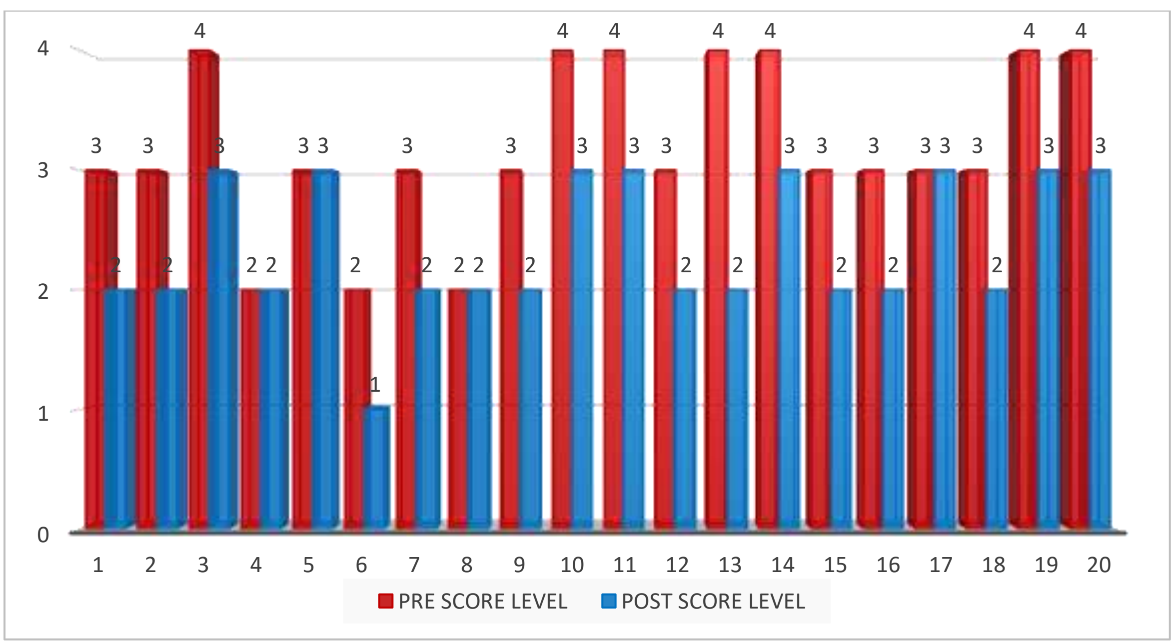


Table 4: Pre – post scores of Manual Ability Classification System (MACS):

Graph 4: Graphical display ofPre-post scores of MACS



RESULT

A total of 20 subjects participated in this study. The score was evaluated by DTVP-2 scale and BOT-2 scale.
The subjects have showed significant changes in visual motor integration skills after the intervention.

- In the study, the pre mean eye-hand co-ordination (EHC) was 9.65 with standard deviation of 1.18 was improved to post mean EHC to 10.90 with standard deviation of 1.33 which was statistically significant (p-value<0.00008).
- In the study, the pre mean copying (CO) was 9.75 with a standard deviation of 1.52 was improved to post mean of 10.85 with a standard deviation of 1.63 which was statistically significant (p-value <0.00014).
- In the study, pre – mean figure ground(FG) was 9.75 with standard deviation of 1.16 was improved to post mean figure ground 10.90 with standard deviation of 1.17 which was statistically significant (p- value <0.00008)
- In this study, pre-mean visual closure(VC) was 9.85 with standard deviation of 1.76was improved to post mean visual closure of 10.90 with standard deviation of 1.59 which was statistically significant (p-value <0.00014)
- In this study, pre-mean form constancy(FC) was 9.95 with standard deviation of 1.54 was improved to post mean form constancy of 11.05 with standard deviation of 1.54 which was statistically significant (p-value <0.00008).
- In this study, the pre mean fine motor precision(FMP) was 14.35 with standard deviation of 3.12 and improved to post mean FMP of 15.55 with standard deviation of 2.98 which was statistically significant(p-value<0.00008).
- In this study, the pre mean of upper limb coordination(ULC) was 13.40 with a standard deviation of 3.82 and improved to post mean of 14.50 with standard deviation of 3.69 which was statistically significant(p-value<0.00008).
- In this study, the pre mean balance was 12.10 with standard deviation of 3.09 which was improved to post mean of 13.15 with a standard deviation of 3.08 which was statistically significant(p-value<0.00008).
- In this study, the pre mean strength and agility was 10.55 with standard deviation of 3.20 and improved to post mean of 11.65 with a standard deviation of 3.07 which was statistically significant(p-value <0.00008).

DISCUSSION

This study aimed to look at the changes in visual motor integration of children with cerebral palsy by combining both conventional physical therapy and augmented biofeedback training. Visual motor integration skills are dependent on intact visual perception, sustainedattention, fine motor coordination and motor inhibition. In this study the evaluation of visual motor function was evaluated byBOT-2 and visual motor perception was evaluated by DTVP-2. The pre and post values were recorded in this study. Impact of augmented biofeedback with conventional physical therapy was assessed using these tests.

- In the study, the pre mean eye-hand co-ordination (EHC) was 9.65 with standard deviation of 1.18 was improved to post mean EHC to 10.90 with standard deviation of 1.33 which was statistically significant (p-value<0.00008).
- In the study, the pre mean copying(CO) was 9.75 with a standard deviation of 1.52 was improved to post mean of 10.85 with a standard deviation of 1.63 which was statistically significant (p-value <0.00014).
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- In this study, pre-mean form constancy(FC) was 9.95 with standard deviation of 1.54 was improved to post mean form constancy of 11.05 with standard deviation of 1.54 which was statistically significant (p-value <0.00008).
- In this study, the pre mean fine motor precision(FMP) was 14.35 with standard deviation of 3.12 and improved to post mean FMP of 15.55 with standard deviation of 2.98 which was statistically significant(p-value<0.00008).
- In this study, the pre mean of upper limb coordination(ULC) was 13.40 with a standard deviation of 3.82 and improved to post mean of 14.50 with standard deviation of 3.69 which was statistically significant(p-value<0.00008).
- In this study, the pre mean balance was 12.10 with standard deviation of 3.09 which was improved to post mean of 13.15 with a standard deviation of 3.08 which was statistically significant(p-value<0.00008).
- In this study, the pre mean strength and agility was 10.55 with standard deviation of 3.20 and improved to post mean of 11.65 with a standard deviation of 3.07 which was statistically significant(p-value <0.00008).

The pre and post intervention comparison showed significant changes in the total score. VMI is defined as fine motor and coordination of visual perception. All subjects in this study had lower than average motor skills. It is proposed that the improvement of visuo-motor control by augmented biofeedback with conventional physical therapy occurs at higher level in terms of the efficiency of sensorymotor system in processing visual information for motor control.

Since this study provided both augmented biofeedback with conventional physical therapy, it is thought that it was an intervention method that could further compensate for cognitive deficit of children with intellectual disabilities. According to results of this study, augmented biofeedback with conventional physical therapy is an intervention method for children with intellectual disabilities, with moderate to strong impacts on visual perception and motor function.

There occur many changes in children with cerebral palsy after early childhood. They are faced with many self-help activities of daily living and exposed to self-study environment following intensive play and care at home. Also the program used in this study can be used as a home exercise program.

CONCLUSION

As per statistical data augmented biofeedback combined with conventional physical therapy for improvement in visual motor integration skills on hand function is an effective training method for children with cerebral palsy that promote visual perception and motor function.

RECOMMENDATION AND LIMITATIONS OF THE STUDY

LIMITATIONS

- The psychological aspects of the subjects were not assessed.
- This study contained small number of participants,

RECOMMENDATION

- Future studies should include randomized controlled trials involving large number of participants,
- It should also investigate whether augmented biofeedback with conventional physical therapy have long term result

Acknowledgment
We would like to thank all the participants who participated in this study

Declarations
Conflicts of interest: Nil
Funding sources: Self
Ethical clearance: Verbal consent and written consent were taken from each subject who participated in the study and Ethical clearance from our Institutional Ethical committee (IEC)

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DEMYSTIFYING DATA PROCESSING TEACHERS' PROCEDURAL, FUNCTIONAL, PEDAGOGICAL, AND CONTENT KNOWLEDGE IN AN ICT-BASED CLASSROOM IN SOUTH AFRICA

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ABSTRACT

The paper examines the level of Procedural, Functional, Pedagogical, and Content Knowledge (PFPCK) competency needed by Data Processing (DP) teachers to effectively use Information and Communication Technology (ICT) tools in ICT-based classrooms. A descriptive survey research design was used in the study. Three research questions were raised, and one hypothesis was formulated to guide the study. 130 DP teachers randomly selected from 11 Technical Vocational Education and Training (TVET) colleges in Gauteng province in South Africa formed the sample population. The instrument used in the study was a self-developed questionnaire titled Data Processing Teachers' Competency of Procedural Functional Pedagogical Content Questionnaire (DPTCPFPCQ). Personal and observation checklists were also used in the study. The data were analyzed using mean scores and t-tests. The results showed that DP teachers possessed the necessary competency of PFPCK needed to use ICT tools in the digital classroom. It was also revealed that there was a significant difference in the level of competency and acquisition of skills between the pre-service and in-service DP teachers in the use of ICT in the class. It was therefore recommended that the management of TVET colleges and other similar institutions should help to improve DP teachers' procedural, and functional knowledge in the use of ICT as a pedagogical tool in ICT-enhanced classrooms.

KEYWORDS: *ICT-based classrooms, Procedural, Functional Knowledge, DP teachers.*

INTRODUCTION

Information and Communication Technology (ICT) significantly influences the way we learn, communicate, and do business in any facet of our life. It is shaping the world economy, producing rapid changes in society at large. This has revolutionized modern digital classrooms influencing teachers in the process of imparting knowledge through the use of modern learning facilities such as ICT materials. Herein lays the challenges for teachers to use innovative strategies to spur varied potentials and abilities of teachers by equipping them with appropriate knowledge and skills; to function as highly motivated and conscientious teachers in the digital age.

However, the essential types of knowledge that can enhance effective teaching and learning in an ICT-enhanced classroom have been identified in the literature to include pedagogical, content, functional, and procedural knowledge as applied to Science, Engineering, and Technology (SET) (Nissen, 2006). Pedagogical knowledge refers to the knowledge of methods and strategies employed by teachers in the process of teaching and learning. This knowledge includes the fundamental knowledge of classroom management, sequential lesson preparation, student motivation, assessment, and evaluation. Declarative knowledge (Content) is defined by Ryle (1958) as "know that", which is a form of knowledge that is associated with representations of facts rather than assimilation of facts into constructs that guide effective actions. This is also referred to by some researchers as content knowledge (Shulman, 1986). Functional knowledge is defined by Ryle (1958) as "know-how" having the ability to describe the steps and rules to perform a function, but not to articulate the description of what is known and put it into practice effectively. Biggs (2003) describes this kind of knowledge as functional, which is also referred to by other researchers as technological knowledge (Mishra & Koehler, 2005).

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THEORETICAL CONTEXT

In the digital classroom environment, technological knowledge is much more than just knowing about technology or having the orientation to use technology. Procedural knowledge, according to Biggs (1999), is the ability or skills of the knower to choose and perform some actions in an appropriate and effective manner. Nissen (2006) argues that knowing how to ride a bicycle can only be demonstrated by mounting and actually riding the bicycle. He made a clear distinction between having the ability to perform a function, which is functional knowledge and performing the action by effectively applying skills in practical terms, which is procedural knowledge. Hiebert and Lefevre (1986) defined procedural knowledge as rules or procedures for solving problems in that procedures are sequentially ordered deterministic instructions for how to perform a given task effectively. Hiebert and Lefevre (1986) argue that procedural knowledge denotes the dynamic and successful utilization of rules or procedures that require not only the knowledge of the object being utilized but also the knowledge of the format and the syntax for a representational system. Many researchers find that procedural knowledge confirms the mastery of content knowledge and that functional knowledge enables the development of content (Hiebert & Lefevre, 1986; Biggs, 1999). *Procedural knowledge* is assessed non-verbally by observing the execution of a procedure with dexterity in solving basic problems. Procedural knowledge means knowing the technique for implementing a task through certain skills we possess (Reber & Reber, 2001).

TECHNOLOGICAL KNOWLEDGE CONSTRUCTS

The knowledge related to the effective use of educational technologies has become widely recognized as an important aspect of the knowledge base of educators in the 21st century.

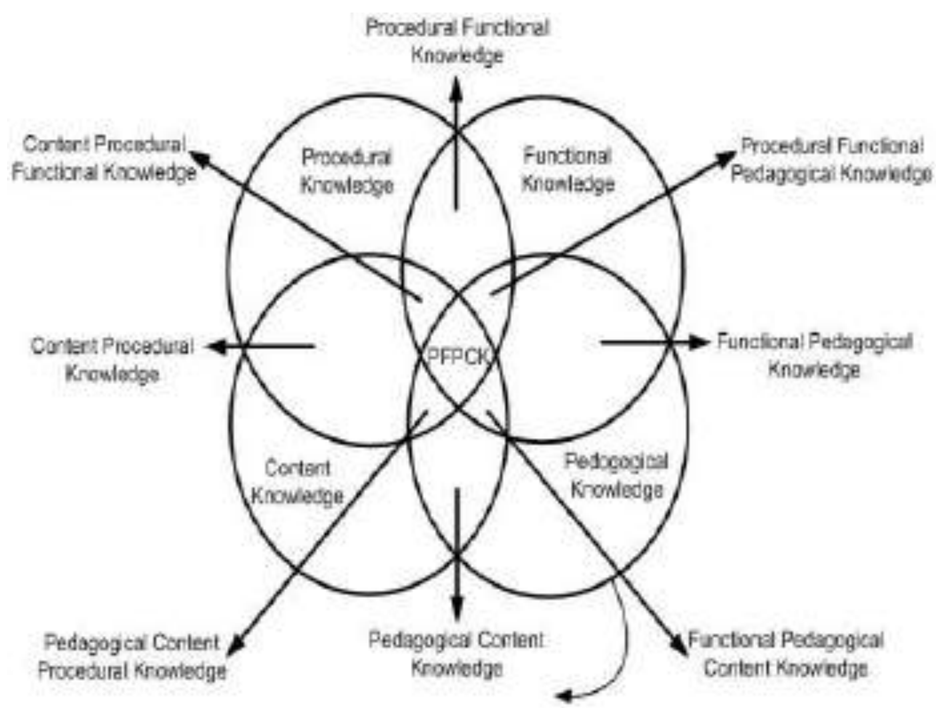

Figure 1: The PrFPACK theoretical framework (Adegbenro, Olugbara & Mwakapenda (2012)

The procedural, functional, pedagogical, and content knowledge (PrFPACK) is a theoretical framework proposed to holistically explore the technological knowledge and e-skills of teachers in an ICT-enhanced classroom. According to Adegbenro, Olugbara, and Mwakapenda (2012), this framework extended the classical TPACK by replacing "technological knowledge" with "procedural functional knowledge" to give the framework precise clarity. That is, the "T" (technological) in TPACK is replaced by "PrF" (procedural functional) to obtain an extended theoretical framework and, thus, the acronym TPACK-PrFPACK. In 2005 Mishra and Koehler (2005) updated and built on Shulman's idea of Pedagogical Content Knowledge (PCK), Shulman (1986). Mishra and Koehler proposed the necessity for the integration of technology with PCK and named the resulting amalgam knowledge Technological Pedagogical and Content Knowledge (TPACK). The strength of TPACK is that it provides a framework to examine what knowledge teachers need to

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integrate technology into teaching and learning. Authors such as Yilmaz-Ozden, Mouza Karchmer-Klein & Glutting (2013) have confirmed the need to provide more clarity about the TPACK framework and to revisit measurement inventories built directly around the framework. The PrFPACK inventory consists of a set of 39 comprehensive measures that were organized into thirteen sub-domains of knowledge. We defined a measure as comprehensive if it is unambiguous and it directly measures what it intends to measure in clear terms. The knowledge sub-domains relate to specific theoretical constructs such as PK (pedagogical knowledge), CK (content knowledge), FK (functional knowledge), PrK (procedural knowledge), PCK (pedagogical content knowledge), PrPK (procedural pedagogical knowledge), PrFK (procedural functional knowledge), FCK (functional content knowledge), PrFCK (procedural functional content knowledge), PrFPK (procedural functional pedagogical knowledge), PrPcK (procedural pedagogical content knowledge), FPCK (functional pedagogical content knowledge) and PrFPCK (procedural functional pedagogical knowledge). Figure 1 shows the PrFPACK that was used in this study to empirically explore the nature of teachers' knowledge and skills in the use of ICT as pedagogical tools. The PrFPACK framework specified a set of common items, which is outcome-based in scope, and measures specific technological proficiency and expertise with the computer and data projector for pedagogical practices.

RESEARCH QUESTIONS

Three research questions were raised to guide the study:

1. What is the level of Data Processing DP teachers' content knowledge in the use of ICT as a pedagogical tool?
2. What is the level of DP teachers' functional knowledge in the use of ICT as a pedagogical tool?
3. What is the level of DP teachers' procedural knowledge in the use of ICT as a pedagogical tool?

RESEARCH HYPOTHESIS

1. There is no significant difference in the level of procedural functional content knowledge between DP teachers with 1-5 years of experience (pre-service) and 6 years and above experience (in-service) in the use of ICT.

METHODOLOGY

The study employs a descriptive survey research design to determine the conceptualization of procedural functional pedagogical content knowledge of DP teachers in digital classrooms in South Africa. The population of the study comprised 11 Technical and Vocational Education Colleges (TVET) in South Africa. The sample population consisted of one hundred and thirty (130) Data Processing Teachers (DPT) randomly selected from eleven (11) technical and vocational education colleges in Gauteng province in South Africa. The instrument used in this study was a self-developed questionnaire titled "Data Processing Teachers Competency of Procedural Functional Pedagogical Content Questionnaire (DPTCPFPCKQ). It was a five-point scale questionnaire of highly incompetent, incompetent, competent, and highly competent with scores of 1,2,3,4,5 respectively. The instrument was validated by two experts in test measurements and evaluation. Cronbach. Alpha was used to establish the reliability of the instrument. The positive value of 0.82 was recorded and so the instrument was considered suitable to be used for the study. Personal interviews and observation checklists were also used. Data collected was analyzed using mean scores and t-tests.

Results:

Research Question 1:

What is the level of Data Processing Teachers' DPT content knowledge in the use of ICT as a pedagogical tool?

Table 1 Level of DP Teachers' Content Knowledge (CK) in the Use of ICT

S/No	Item	Mean	Std. Deviation
1	I know various concepts and applications of spreadsheet programs including MS Excel.	3.88	1.34
2	I know various concepts and applications of Internet and web technology including video conferencing, sending e-mail, web surfing, and business correspondence.	3.86	1.28
3	I know various concepts and applications of advanced information presentation systems including Interactive Teaching Box and Power Point Presentation.	3.76	1.21
4	I know various concepts and applications of Word processing, Audio Typing, and Data transcription systems.	4.01	1.04
5	I know various concepts and applications of advanced database management systems	4.32	1.36
Weighted Average		**3.96**	

Key: **1** = Highly Incompetent**, 2** = Incompetent**, 3** = Fairly Competent**, 4** = Competent**,**
5 = Highly Competent

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Decision Value: 0.00-2.94 = Low, 2.95-5.00 = High

Table 1 above shows that the DP teachers are competent in the content knowledge as follows: know various concepts and applications of spreadsheet programs including MS Excel ($\bar{x} = 3.88$), know various concepts and applications of internet and web technology including video conferencing, sending e-mail, web surfing and business correspondence ($\bar{x} = 3.86$), know various concepts and applications of advanced information presentation systems including Interactive Teaching Box and PowerPoint Presentation ($\bar{x} = 3.76$), know various concepts and applications of Word processing, Audio Typing and Data transcription systems ($\bar{x} = 4.01$) and know various concepts and applications of advanced database management systems ($\bar{x} = 4.32$). Based on the value of the weighted average (3.96 out of 5.00 maximum value that can be obtained), which falls within the decision value for high, it can be inferred that the level of DP teachers' content knowledge in the use of ICT as a pedagogical tool is high.

Research Question 2:

What is the level of data processing teachers' functional knowledge in the use of ICT as a pedagogical tool?

Table 2 Level of DP Teachers' Functional Knowledge in the Use of ICT

S/No	Item	Mean	Std. Deviation
1	I know how to use Interactive Teaching Box (IBOX) and Data Projector to teach various concepts of spreadsheet programs.	4.06	1.03
2	I know how to use the internet and web technology to perform various information communication tasks such as sending e-mails, surfing the web, and establishing network connections.	2.72	1.06
3	I know how to use word processing, window media, audio typing, and data transcription systems to perform various document preparation tasks such as note taking, minutes reporting, file storage, retrieval, and printing.	3.50	1.04
4	I know how to use IBOX, Data Projector to teach various concepts of advanced information presentation systems to solve content delivery problems.	2.50	1.01
5	I know how to use Data Projector and IBOX to teach various advanced database management systems concepts to solve file management problems.	4.41	1.00
Weighted Average		**3.44**	

Key: **1** = Highly Incompetent, **2** = Incompetent, **3** = Fairly Competent, **4** = Competent, **5** = Highly Competent

Decision Value: 0.00-2.94 = Low, 2.95-5.00 = High

Table 3 above, shows that the DP teachers are competent in the functional knowledge as follows: know how to use Interactive Teaching Box (IBOX) and Data Projector to teach various concepts of spreadsheet programs ($\bar{x} = 4.06$), know how to use word processing, window media, audio typing, and data transcription systems to perform various document preparation tasks such as, note taking, minutes reporting, file storage, retrieval and printing ($\bar{x} = 3.50$) and know how to use Data Projector and IBOX to teach various concepts of advanced database management systems to solve file management problems ($\bar{x} = 4.41$). The table further shows that the DP teachers are fairly competent in the following: know how to use the internet and web technology to perform various information communication tasks such as, sending e-mail, surfing the web, and establishing network connection ($\bar{x} = 2.72$) and know how to use IBOX, Data Projector to teach various concepts of advanced information presentation systems to solve content delivery problems ($\bar{x} = 2.50$). Based on the value of the weighted average (3.44 out of 5.00 maximum value that can be obtained), which falls within the decision value for high, it can be inferred that the level of DP teachers' functional knowledge in the use of ICT as a pedagogical tool is high.

Research Question 3: What is the level of DP teachers' procedural knowledge in the use of ICT as a pedagogical tool?

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Table 3 Level of DP Teachers' Procedural Knowledge (PK) in the Use of ICT Tools

S/No	Item	Mean	Std. Deviation
1	I can effectively demonstrate the right steps to use a data projector and IBOX to teach Spreadsheet programs and solve all minor technical troubleshooting problems when the need arises without disrupting the lessons.	3.98	1.44
2	I can effectively demonstrate the right steps to use IBOX and data projector to teach web technology, internet, and window media player to solve various information communication problems.	4.21	1.58
3	I can effectively demonstrate the right steps to use a Data projector to teach word processing, audio typing, and data transcription systems and solve minor technical troubleshooting problems as the need arises without disrupting the lesson.	3.76	1.35
4	I can effectively demonstrate the right steps to use a Data projector and IBOX to teach various concepts of advanced database management systems and solve technical troubleshooting problems as the need arises without disrupting the lessons.	4.01	1.49
5	I can effectively demonstrate the right steps to use IBOX and data projector to teach advanced information presentation systems and address minor technical troubleshooting problems without disrupting the lessons.	4.42	1.62
	Weighted Average	**4.08**	

Key: **1** = Highly Incompetent**, 2** = Incompetent**, 3** = Fairly Competent**, 4** = Competent**,**
5 = Highly Competent

Decision Value: 0.00-2.94 = Low, 2.95-5.00 = High

Table 3 above, shows that the DP teachers are competent in the procedural knowledge as follows: effectively demonstrate the right steps to use data projector and IBOX to teach Spreadsheet programs and solve all minor technical trouble shooting problems when the need arises without disrupting the lessons ($\bar{x} = 3.98$), effectively demonstrate the right steps to use IBOX and data projector to teach web technology, internet and window media player to solve various information communication problems ($\bar{x} = 4.21$), effectively demonstrate the right steps to use Data projector to teach word processing, audio typing and data transcription systems and solve minor technical trouble shooting problems as the need arises without disrupting the lesson ($\bar{x} = 3.76$), effectively demonstrate the right steps to use Data projector and IBOX to teach various concepts of advanced database management systems and solve technical trouble shooting problems as the need arises without disrupting the lessons ($\bar{x} = 4.01$) and effectively demonstrate the right steps to use IBOX and data projector to teach advanced information presentation systems and address minor technical trouble shooting problems without disrupting the lessons ($\bar{x} = 4.42$). Based on the value of the weighted average (4.08 out of 5.00 maximum value that can be obtained), which falls within the decision value for high, it can be inferred that the level of ODP teachers' procedural knowledge in the use of ICT as a pedagogical tool is high.

Test of the Hypotheses

Ho 1: There is no significant difference in the level of procedural functional content knowledge between data processing teachers with 1-5 years of experience (preservice) and 6 years and above experience (Inservice) in the use of ICT tools.

Table 4 Summary of T-test showing Difference between pre-service and in-service DP Teacher's Procedural Functional Content Knowledge

	Year of Experience	N	Mean	Std. D	df	t	Sig (p)	Remark
KNOW LEDGE	Preservice (1-5)	74	40.91	7.99	98	6.692	.000	Significant
	Inservice (6years & above)	56	53.68	9.52				

Table 4 above, shows the difference in the level of procedural functional content knowledge of DP teachers. The table shows that the mean score of Data processing teachers with 1-5 years of experience (preservice) is 40.91 while that of those with 6 years and above (in-service) is 53.68. Therefore, there is a significant influence of procedural functional content knowledge PFCK between data processing teachers with 1-5 years of experience (preservice) and 6 years and above experience (in-service) in the use of ICT. This implies that the in-service DP teachers possessed a high level of procedural functional content knowledge PFCK to use ICT tools for classroom instruction. Therefore, the hypothesis states that "there is no significant difference in the level of procedural functional content knowledge PFCK between data processing teachers with 1-5 years of experience (preservice) and 6 years and above experience (in-service) in the use of ICT is not accepted.

DISCUSSION

The result of the analysis of research question one revealed that DP teachers demonstrated a high level of content knowledge in using ICT tools in the classroom. It was revealed in the study that DP teachers are competent to use internet facilities and e-mail for effective teaching in the class. This finding agrees with SAIDE (2009) who find out that content and ICT knowledge are essential for enhancing teaching and learning in the digital age.

On the level of competency of DP teachers' functional and procedural knowledge in the use of ICT as a pedagogical tool, the finding of the study revealed that DP teachers are competent. The study is in agreement with the submission of Pavlova (2005) who claimed that technology knowledge has been strongly associated with the application of scientific knowledge ie ICT knowledge in effective teaching and learning.

On the significant difference in the level of procedural functional content knowledge between data processing teachers with 1-5 years of experience (preservice) and 6 years and above experience (in-service) in the use of ICT, a significant difference was found between the in-service and preservice. The reason for this could be attributed to the fact that in-service had enough working experience and they were able to possess all the necessary knowledge and ICT skills to teach effectively in the ICT-based classroom. The results of this study are in conformity with the findings of (SAIDE, 2009) that learning to use ICT in a pre-service teacher education class is not as compelling as learning to use ICT as you teach in the classroom. In-service and preservice teachers were able to use ICT infrastructure to a certain degree in their DP classrooms and they demonstrated the understanding of some basic concepts, steps, and principles that guide the use of ICT for the teaching of DP. In general, in-service DP teachers were more able to effectively use all available ICT tools in their ICT-based classrooms and they exhibited technological knowledge with dexterity in solving basic technical troubleshooting problems more than the preservice Data processing teachers.

CONCLUSION

Procedural, functional, and pedagogical knowledge are essential types of knowledge that are quite imperative in effective teaching and learning, especially in ICT-based classrooms. The classroom observation and interview afterward made a clear indication of the differences in the procedural functional knowledge of in-service and pre-service teachers based on their years of experience. The study has established the rationales to differentiate between functional and procedural knowledge when considering the technological knowledge of teachers.

Technology is re-defined in this study as the application of knowledge and skills in the astute use of practical instruments to solve problems and enhance effective performance.

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ASSESSMENT OF THE STABILITY OF THE PIT WALL USING THE CUBIC SPLINE METHOD AND THE SLOPE ANGLE OF THE PIT WALL TRAJECTORY

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ABSTRACT
This paper deals with the problem of determining the optimal shape of the board trajectory and the evaluation of the stability factor, in order to ensure the stability of the boards, increasing the safety of overburden mining in the process of open-cut mining. In determining the trajectory of the boarder the method of cubic splines is used. To apply this method, the length of the base of the quarry (or ledge) is divided into arbitrary n parts and in each partial segment is constructed corresponding cubic spline function, being combined, each curve in common, gives a general curve corresponding to the profile of the trajectory of the pit wall. Then the stability margin of the pit wall K is estimated, considering it as the ratio of the sum of the tangents of the angles φ_i, where $i=\overline{1,n-1}$, formed between the tangents to the curve at the points x_i,where $i=\overline{1,n-1}$, which serves as the trajectory of the pit wall, considering them as restraining forces, as well as the tangents of the angles $\varphi_i-\beta$, where β-is the slip angle of the rock mass and the added $tg\beta$, which are shear forces.
KEY WORDS: *scarp slopes, fracture, stability, board, optimal board trajectory, interpolation, spline function, cubic spline method, algebraic polynomial, stability margin, angle tangent, holding and shear forces.*

ОЦЕНКА УСТОЙЧИВОСТИ БОРТА КАРЬЕРЫ С ПРИМЕНЕНИЕМ МЕТОДА КУБИЧЕСКОГО СПЛАЙНА И УГЛА НАКЛОНА ТРАЕКТОРИИ БОРТА

Аннотация: *В данной статье рассматривается задача об определении оптимальной формы траектории борта и оценка коэффициента запаса устойчивости, с целью обеспечении устойчивости бортов, усилении безопасности ведения вскрышных работ в процессе добычи полезных ископаемых открытым способом. При определении траектории борта используется метод кубических сплайнов. Для применения этого метода длина основании карьеры (или уступа) разбивается на произвольные* n *части и в каждом частичном отрезке строится соответствующая кубическая сплайн функция, будучи объединенная, каждая кривая в общую, даёт общую кривую, соответствующую профилю траектории борта карьеры. Далее оценывается коэффициент запаса устойчивости борта карьеры* K, *рассматривая его как отношение суммы тангенсов углов* φ_i, *где* $i=\overline{1,n-1}$, *образованных между касательными к кривой в точках* $\boldsymbol{x_i}$, где $i=\overline{1,n-1}$, *которая служит траекторией борта карьеры, рассматривая их как удерживающих сил, а также тангенсов углов* $\varphi_i-\beta$, *где* β*-угол наклона скольжения горного массива и прибавленного* $tg\beta$, *которые являются сдвигающимися силами.*
Ключевые слова: *откосы уступов, разрушение, устойчивость, борт, оптимальная траектория борта, интерполяция, сплайн – функция, метод кубического сплайна, алгебраический многочлен, коэффициент запаса устойчивости, тангенс углов, удерживающие и сдвигающие силы.*

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Изучение различной литературы по горному делу, посвященной обеспечению устойчивости бортов карьеры показывает, что в этом направление ведутся множество исследовательских разработок. Мировой опыт показывает, что обеспечение устойчивости бортов карьеры при вскрышных работ и добычи полезных ископаемых открытым способом, в основном ведутся трех направлениях [1-3], которые зависят от траектории бортов карьеры. Траектория бортов карьеры могут быть следующей форме: выпуклой, вогнутой или наклонной прямой. Вид бортов карьеры, при их разработке, зависит от многих факторов, таких например, структуры почвы, рельефа местности, способов ведения работы, наличии техники, персонала и т.д. В процессе определение траектории устойчивости бортов карьеры, естественно учитываются финансовые, материальные и другие расходы. Именно по этим критериям выбираются один из трех вышеуказанных видов траектории бортов карьеры. По затратным соображениям, при ведении вскрышных работ, наиболее выгодным является выпуклая форма траектории борта карьеры, если удастся выбрать более точного угла наклона борта. Но, учитывая вышеприведенных факторов, ведутся разработки в виде вогнутую или наклонную прямую форму бортов карьеры. Во всех формах определения траектории борта карьеры особое внимание уделяются на углах наклона борта, который является одним из важнейших параметров в процессе ведения открытых горных работ [4]. Учитывая этот факт, для определения траектории борта карьеры используем метод кубических сплайнов.

Идея использования метода сплайна кубической интерполяции [5-6] заключается в том, что разрабатываемый по проекту участок, как горизонтально, так и вертикально, произвольным образом разбиваются на несколько частей, горизонтально и вертикально. Обозначим эти отрезки по горизонтали через $[a;\ b]$, вертикальный отрезок как $[c;\ d]$. Разобьем отрезок $[a;\ b]$ точками $a = x_0, x_1, x_2, \dots, x_n = b$ и отрезок $[c;\ d]$ точками $c = y_0, y_1, y_2, \dots, y_2 = \ d$ на частичные отрезки. На каждом частичном отрезке $[x_i, x_{i+1}]$, где $i = \overline{0, n-1}$, определим кубический многочлен. Далее, полученные многочлены стыкуются, при определенных условиях, что в результате получим единую гладкую кривую линию, которая в итоге определяет искомую траекторию борта карьеры.

Пусть у нас имеются значения функции, измеренные в нескольких точках, возникает задача, как найти значения функции в промежуточных точках. Такая задача называется задачей *интерполяции* и часто возникает на практике. Например, в геологии проводится опробование месторождение и определяется концентрация полезных ископаемых в определенных точках, в этом случае, с помощью интерполяции можно оценить концентрацию в промежуточных точках. Список реальных примеров легко продолжить.

Перед нами стоит задача: наиболее точно определить вид этой функции по заданным значениям. Один из возможных подходов - прибегнуть к интерполяции сплайнами.

Используем полученные данные работы [7], в которой определены кубические сплайны.

Пусть в результате экспериментов, получена некоторая зависимость функции $y = f(x)$ от переменной x, в виде таблицы (таб. 1).

Таблица 1.

i	0	1	2	…	n
x	x_0	x_1	x_2	…	x_n
y	y_0	y_1	y_2	…	y_n

Таб.1. *Зависимость функции $y = f(x)$ от переменной x, где i-номера точек, x-значения переменной, y-значения функции.*

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Используя данные из таблицы напишем общий вид кубического сплайна для номера i, где $i = \overline{0, n-1}$:

$$\boldsymbol{y_i = S_i(x_i) = a_i + b_i(x - x_i) + c_i(x - x_i)^2 + d_i(x - x_i)^3}. \quad (1)$$

Предположим, что найдены все промежуточные сплайн функции, определяемые формулой (1). Тогда объединяя промежуточных сплайн функции, можно построить общую гладкую кривую, которая определяет искомую траекторию борта карьеры.

Теперь переходим к доказательству устойчивости этой траектории. На устойчивость отвалов существенное влияние оказывают угол наклона площадки основания отвала, обводненность пород основания и отвальных масс, технология формирования отвалов. Величину коэффициента запаса устойчивости откосов определяет ряд факторов, среди которых основными являются: надежность определения механических характеристик пород, т.е. угла внутреннего трения и сцепления [8].

Используя этот факт, оценим коэффициент устойчивости борта карьеры K, рассматривая его как отношение суммы тангенсов углов φ_i, где $i = \overline{1, n-1}$, образованных между касательными к кривой в точках $\boldsymbol{x_i}$, где $i = \overline{1, n-1}$, которая служит траекторией борта карьеры, а также тангенсов углов $\varphi_i - \beta$, где β-угол наклона скольжения горного массива и прибавленного $tg\beta$, которые являются сдвигающимися силами, т.е. если принимать

$$K_{уд} = tg\varphi_1 + tg\varphi_2 + tg\varphi_3 + \ \dots + tg\varphi_{n-1} \quad \text{и}$$

$$K_{сд} = tg(\varphi_1 - \beta) + tg(\varphi_2 - \beta) + tg(\varphi_3 - \beta) + \dots + tg(\varphi_{n-1} - \beta) + tg\beta, \text{ то}$$

$$K = \frac{K_{уд}}{K_{сд}} = \frac{tg\varphi_1 + tg\varphi_2 + tg\varphi_3 + \dots + tg\varphi_{n-1}}{tg(\varphi_1 - \beta) + tg(\varphi_2 - \beta) + tg(\varphi_3 - \beta) + \dots + tg(\varphi_{n-1} - \beta) + tg\beta}. \quad (2)$$

Если принимать во внимание то, что $tg\varphi_i = S_i(x_i)$ и (1), тогда коэффициент запаса устойчивости K борта карьеры можно оценить по формуле

$$K = \frac{S_1(x_1) + S_2(x_2) + S_3(x_3) + \dots + S_{n-1}(x_{n-1})}{tg(\varphi_1 - \beta) + tg(\varphi_2 - \beta) + tg(\varphi_3 - \beta) + \dots + tg(\varphi_{n-1} - \beta) + tg\beta} = \frac{\sum_{i=1}^{n-1} S_i(x_i)}{\sum_{i=1}^{n-1} tg(\varphi_i - \beta) + tg\beta}. \quad (3)$$

Для устойчивости борта карьеры требуется выполнение условии $K > 1$. Выполнение этого условия обеспечивается если имеет место следующие:

1) $\varphi_1 > \varphi_2 > \ldots > \varphi_{n-1}$, т.е. углы φ_i, где $i = \overline{1, n-1}$, образуют убывающую последовательность от подошвы до вершины карьера;
2) $\varphi_{n-1} > \beta$, т.е. наименшее из углов φ_{n-1} всегда будет больше чем β −угла наклона скольжения горного массива.

На рисунке 1 проиллюстировано полученная гладкая кривая $\boldsymbol{y = S(x)}$, являющася траекторией борта карьеры, разбитая на n частей, углы φ_i, где $i = \overline{1, n-1}$, β −угол наклона скольжения горного массива.

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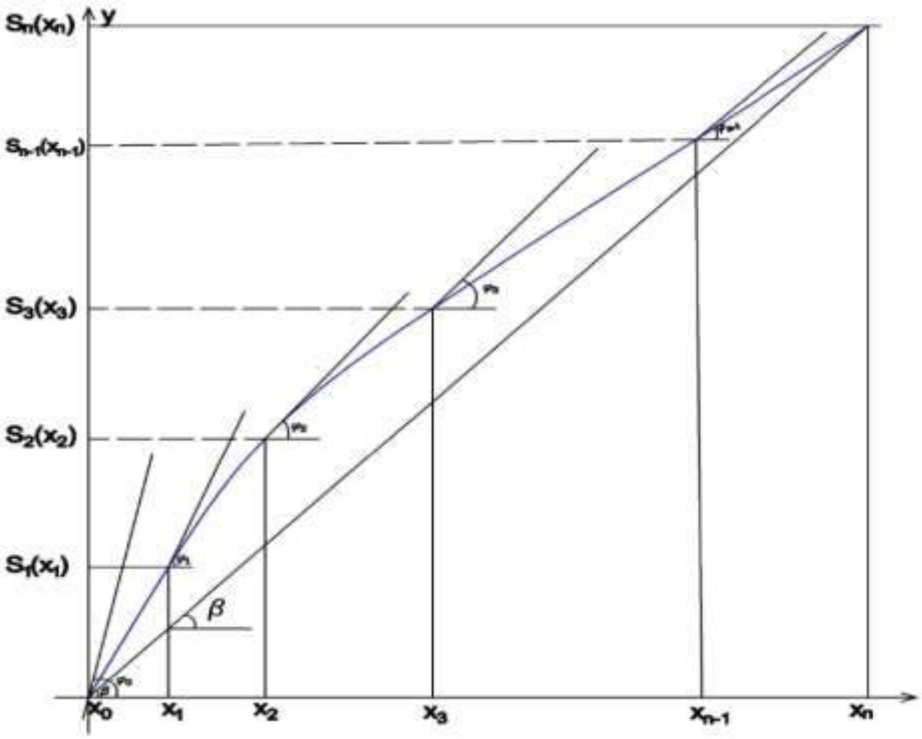

Рисунок 1. *φ_i-углы образованные между касательными к кривой в точках x_i, $i = \overline{1, n-1}$ и осью Ox, -угол наклона скольжения горного массива.*

Таким образом, здесь доказана следующая теорема.

Теорема. *Если траекторией борта карьеры является выпуклой гладкой кривой $\boldsymbol{y} = \boldsymbol{S}(\boldsymbol{x})$, полученной в виде кубического сплайна, то при выполнений условий*

1) $\varphi_1 > \varphi_2 > \ldots > \varphi_{n-1}$, *т.е.* углы φ_i, *где* $i = \overline{1, n-1}$, *образуют убывающую последовательность;*

2) $\varphi_{n-1} > \beta$, *т.е. наименшее из углов φ_{n-1} всегда будет больше чем β −угла наклона скольжения горного массива, φ_i −углы образованные между касательными к кривой в точках x_i и осью Ox, то борт карьеры устойчив и коэффициент запаса устойчивости $K > 1$.*

Проведенная для различных условий оценка необходимого коэффициента запаса устойчивости бортов показала, что в зависимости от надежности исходных данных и категорий он изменяется, как правило, в пределах 1,1–1,5 [8].

Для иллюстрации вышеприведенных фактов рассмотрим пример.

Пример: Найти коэффициент запаса устойчивости K борта карьеры, если $\varphi_1 = 70^0$, $\varphi_2 = 60^0$, $\varphi_3 = 48^0$ и угол наклона скольжения горного массива $\beta = 40^0$, (см. рис.2).

Решение: Для решения поставленной задачи используем формулу (2) (или (3)). Тогда

$$K = \frac{tg70^0 + tg60^0 + tg48^0}{tg(70^0 - 40^0) + tg(60^0 - 40^0) + tg(48^0 - 40^0) + tg40^0} == \frac{tg70^0 + tg60^0 + tg48^0}{tg30^0 + tg20^0 + tg8^0 + tg40^0} =$$

$$= \frac{2{,}747 + 1{,}732 + 1{,}110}{0{,}577 + 0{,}364 + 0{,}141 + 0{,}839} = \frac{5{,}589}{1{,}921} = 2{,}909 > 1.$$

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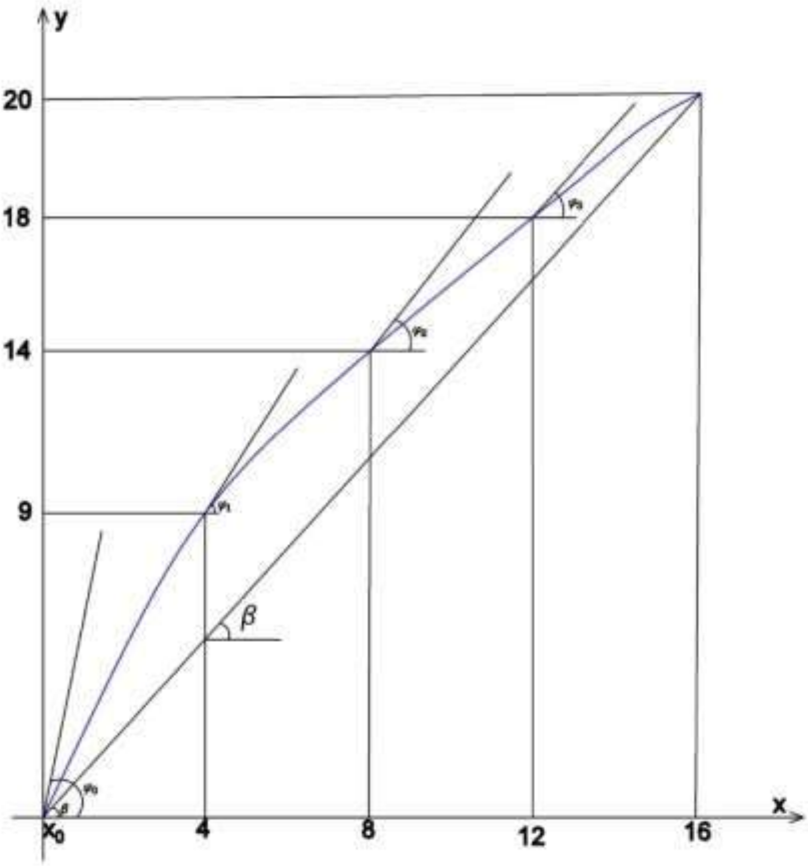

Рисунок 2. *φ_i-углы образованные между касательными к кривой в точках x_i , $i = \overline{1,3}$ и осью Ох, -угол наклона скольжения горного массива.*

По результату решенной задачи следует, что если соблюдены условия теоремы, то коэффициент запаса устойчивости K борта карьеры удовлетворяет требовании технического регламента по безопасности.

Вывод

Таким образом, для определения оптимальной траектории и оценки коэффициент запаса устойчивости K борта карьеры по предложенные методы кубического сплайна и нахождения значения КЗУ K борта карьеры, являются оправданными. Доказанная теорема подтверждает, что при соблюдении условии теоремы, полученные данные, т.е. траектория и оценка коэффициента K борта карьеры, будут наиболее эффективными и малозатратными способами.

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FORMULATION AND EVALUATION OF GLYCEROGELATIN BASED MELOXICAM TRANSDERMAL PATCH

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ABSTRACT

The objective of the study was to develop and evaluate Glycerogelatin based Meloxicam (NSAIDS) Trandermal patch. The study aimed to create a monolithic transdermal therapeutic system for meloxicam using hydroxyl propyl methyl cellulose (HPMC) as a polymer rand gelatin, glycerin, and ethanol as plasticizer, penetration enhancer, and permeation enhancer, respectively, through solvent casting evaporation method. The transdermal patch was evaluated for various parameters, including physical appearance, folding endurance, moisture content, weight variation, drug content uniformity, and in-vitro drug release studies. The article also provides the methodology and experimental work that was done to prepare the transdermal patch, which involved heating gelatin with water, adding HPMC and glycerin, dissolving meloxicam in ethanol, and mixing and sonication of the solutions. The formulation chart of the glycerogelatin based meloxicam transdermal patch is also provided. The article discusses the advantages of transdermal patches over other routes of administration and highlights the potential of meloxicam transdermal patches to provide improved convenience, reduced side effects, consistent drug delivery.

KEYWORDS: *Meloxicam, Solvent Casting Evaporation Method, Evaluation*

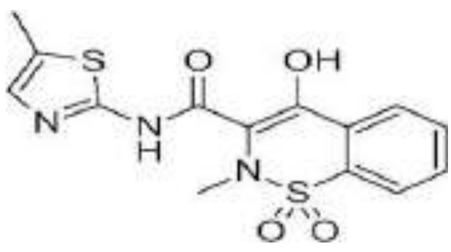
INTRODUCTION

Transdermal drug delivery systems (patches) are dosage forms designed to deliver a therapeutically effective amount of drug across a patient's skin also defined as Medicated adhesive patch that is placed on the skin to deliver a specific dose of Medication through the skin and into the blood stream. Several transdermal drug delivery systems (TDDS) have recently been developed with the aim of accomplishing the objective of systemic medication through the transdermal controlled delivery of pharmaceuticals. The potential of TDDS was first demonstrated by the successful development of a scopolamine releasing TDD system by Alza Corporation approved by FDA in 1981 (Transderm- Scop system, Ciba) for 72-hour prophylaxis or treatment of motion induced sickness and nausea.

Arthritis can be defined as inflammation of one or more joints, causing pain and stiffness that worsens with age. It is basically divided into two types 1. Rheumatoid arthritis 2. Osteoarthritis. It is mainly caused due to inflammation, neurological disorder, trauma, joint instability, genetic factors etc.

Meloxicam is a NSAID used to treat osteoarthritis in adults, rheumatoid arthritis in adults, and juvenile rheumatoid arthritis in pediatrics.

Fig 1: Meloxicam



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Meloxicam transdermal patch is formulated using Gelatin, Glycerin, HPMC-E15 and Ethanol.

Gelatin is a descriptive term for a material composed of a mixture of amino acids and short-chain peptides obtained either by acid hydrolysis (type A) or alkaline hydrolysis(type B) of animal collagen. It is used as coating agent, viscosity enhancer, penetration enhancer etc.

Glycerin is used as a solvent or co-solvent in creams and emulsions. Glycerin is additionally used in aqueous and non-aqueous gels and also as an additive in patch applications.

Ethanol structure enables for the dissolving into polar compounds such as water, non-polar and hydrophilic such as hexane and hydrophobic. Ethanol is also used as a medicinal solvent due to its low toxicity and non-polar capabilities.

HPMC is used as a thickening agent, coating polymer, bio-adhesive, solubility enhancer in solid dispersions, and binder in the process of granulation and in modified release formulations. It is a commonly used as a delivery component in oral pharmaceutical products that provides the release of a drug in a controlled fashion, effectively increasing the duration of release of a drug to prolong its therapeutic effect.

METHODOLOGY AND EXPERIMENTALWORK

Table 1: Formulation table of meloxicam transdermal patch

Sr no	Materials	Quantity
1	Meloxicam	7.5mg
2	Gelatin	5mg
3	Glycerin	0.5ml
4	HPMC	250mg
5	Ethanol	4ml
6	Distilled water	3ml

METHODOLOGY

1. Gelatin was first heated with water until it is dissolved.
2. HPMC in the required amount was added in the above solution followed by 2mlof water. Glycerin was then added when the temperature has decreased to some extent.
3. Meloxicam was separately dissolved in a minimum quantity of ethanol for forming a solution and was sonicated for 10min.
4. The above solution were then mixed and further sonicated for 10 min.
5. The final mixture formed in step4 was spread in petridish previously coated with a lubricant (Glycerin).
6. This petridish covered with a cut funnel and kept at room temp for 24hr away from sunlight.

Fig 2: Meloxicam transdermal patch

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EVALUATION OF DRUG LOADED PATCHES

Physical Appearance

Formulated patches were assessed for their physical attributes, homogeneity, lack of air bubbles, or drug precipitation, which in large part influences whether or not a patient will accept the patch and its therapeutic effectiveness.

Thickness

Using Mitutoyo Digimatic Micrometre, the thickness of the transdermal patch was measured. A rectangular patch's (2x2 cm) thickness was measured three times, and the average thickness was estimated. The same was done for the other patches as well. Each patch's thickness shouldn't vary considerably from the others.

Weight variation

Weighing 10 randomly chosen patches separately and calculating the average weight, weight fluctuation was explored. There shouldn't be a considerable difference between the individual weight and the average weight.

Folding Endurance

The folding capacity of the patches must be determined in order to evaluate folding endurance. Folding endurance is assessed by folding the patch ten times in a row at the same location. Folding endurance value is the number of times a patch can be folded in the same location without breaking.

Moisture Uptake

Patch was kept in desiccators at room temperature for 24hrs. The patch was then taken out and exposed to 84% relative humidity using saturated solution of Potassium chloride in a desiccators until a constant weight is achieved.

Moisture Content

The prepared patches were weighed individually and kept in a desiccators containing calcium chloride at room temperature for 24hrs. The patches were weighed again after a specified interval until they show a constant weight. The percent moisture content was calculated using following formula.

In-Vitro Permeation Studies

Studies of drug permeation are conducted to assess how a drug moves from a patch to the skin's microcirculation. In this investigation, the donor and receptor compartments of Franz diffusion cell12, 13, were separated by a synthetic membrane made of cellulose nitrate. In the receptor compartment, phosphate buffer with a pH of 7.4 was present. On the cellulose nitrate membrane, a transdermal patch was positioned with the donor compartment facing outward. The phosphate buffer-containing receptor compartment was on the other side of the cellulose nitrate membrane. The receiver compartment was maintained at room temperature and was continuously stirred with the help of magnetic stirrer. Samples were withdrawn at specific time interval and equal amount of phosphate buffer was replaced each time to maintain volume of receptor compartment at a constant level. Samples withdrawn were then analyzed for their absorbance and concentration was then calculated.

RESULTS AND DISCUSSION

1. Physical appearance:

Table 2: Physical Appearance of Meloxicam Transdermal Patch

Characteristics	Result
Appearance	Congealed preparation
Color	Slightly yellow
Clarity	Transparent
Flexibility	Good
Smoothness	Good
Presence of air bubble	None

2. Thickness, Weight variation and folding endurance

Table 3: Result of Thickness, Weight Variation and Folding Endurance

	Thickness (mm)	Weight variation (mg)	Folding endurance
MXP1	0.25 ±0.02	498±4	295±7
MXP2	0.28±0.01	508±6	311±9
MXP3	0.29±0.02	496±6	298±4
MXP4	0.26±0.01	502±0	302±0
MXP5	0.28±0.01	506±4	304±2

3. Moisture Content and Moisture Uptake

Table 4: Result of Moisture Content and Moisture Uptake

	Moisture content (%)	Moisture uptake (%)
MXP1	3.12±0.01	3.35±0.09
MXP2	2.27±0.05	2.65±0.18
MXP3	3.24±0.12	3.54±0.14
MXP4	2.95±0.23	3.12±0.05
MXP5	2.55±0.01	2.99±0.28

4. Drug Content Uniformity

Table 5: Result of Drug Content Uniformity

	Drug Content Uniformity (%)
MXP1	95±8.2
MXP2	87±0.2
MXP3	85±1.8
MXP4	82±4.8
MXP5	85±1.8

5. In-Vitro Drug Release

Table 6: In-Vitro Drug Release Studies

Time	Concentration of drug release(%)
0	0
1	3.52
2	6.92
3	12.48
4	20.85
5	26.46
6	32.86
7	41.42
8	50.63
9	59.43
10	64.83
11	75.43
12	84.23

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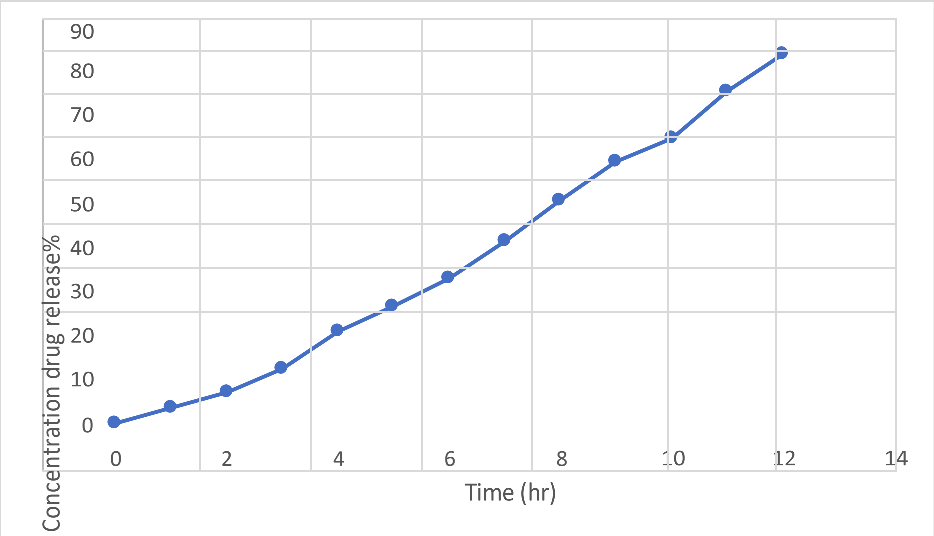

CONCLUSION

It was concluded that suitable Meloxicam transdermal patch was formulated using (HPMC-E15) and Glycerin as a plasticizer, ethanol as skin permeation enhancer using solvent casting method.

The formulated patches were evaluated for the physical parameters and in-vitro drug release studies.

Developed transdermal patch possessed the required physicochemical properties such as folding endurance, thickness of the patch, percentage moisture content, percentage moisture uptake, drug content uniformity.

The thicknesses of the patches were found to be appropriate.

From the result of drug content determination, it was found that there was uniform distribution of drug in patch and deviation was within acceptable limits. All the patches showed uniform drug content.

The formulation showed good in-vitro drug release, attributed to the nature of polymer, permeation enhancer and plasticizers.

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THE ROLE OF SOCIAL MEDIA IN SHAPING CUSTOMER PERCEPTION AND USAGE OF INTERNET BANKING SERVICES: A STUDY IN BALANGIR DISTRICT

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ABSTRACT
The emergence of Internet banking has transformed banking globally. Internet banking has opened up geographical borders by acting as a marketing channel, offering customers a variety of services at lower prices. Investigating the manner in which social media affects customers view and use internet banking services is important and timely. This research delves into the influence of social media on customer attitudes towards internet banking. Using SPSS software, a sample of 173 individual internet banking users from Balangir was analysed through an online survey. The results from the analysis support hypotheses derived from the literature. The findings showed that consumer perceptions of online banking services might be positively or negatively impacted by the content posted on social media sites.

KEYWORDS-*Internet banking, Customers, Balangir*

INRODUCTION

The banking sector has seen a radical change in recent years as a result of the quick development of technology, which has resulted in the widespread use of internet banking services. The rise in popularity of social media platforms has simultaneously revolutionised how individuals interact, communicate, and get information. Social media has consequently become a potent instrument for influencing consumer behaviour across numerous industries, including banking. For banks and other financial institutions looking to increase consumer engagement and effectively promote digital banking solutions, it is essential to comprehend how social media affects how customers perceive and use internet banking services. Social media has become a potent force, shaping various aspects of contemporary life, including how people engage with businesses and avail themselves of services. Within the financial sector, one domain profoundly impacted by this phenomenon is internet banking services. The widespread adoption of social media platforms has led to a revolutionary change in how customers perceive and utilize internet banking services. This transformation is speed up by the dynamic nature of social media, its rapid information dissemination capabilities, and its significant influence on customer behaviour.

The role of social media in shaping customer perceptions and usage of internet banking services is of paramount importance. Social media platforms offer a distinct arena for customers to voice their opinions, share experiences, and interact with financial institutions and their offerings. The accessibility and instantaneous communication facilitated by social media have completely transformed customer interactions with banks and financial service providers.

LITERATURE REVIEW

The way businesses connect with their clients has changed significantly in recent years as a result of the integration of social media and digital technologies. Given that more and more people are using internet banking services for their financial needs, the banking industry has undergone substantial changes (Almaiah et.al,2022). Social media platforms have likewise emerged as important venues for communication and information exchange, offering banks distinctive chances to interact with consumers and shape their attitudes and actions.

Social media has become a potent tool for influencing how customers see online banking services. Social media contacts with banks have a beneficial impact on how conveniently, simply, and securely customers perceive online banking (Sandhu and Arora, 2022). Banks can actively connect with customers by highlighting the advantages of internet banking, responding to their concerns, and clearing up any misconceptions. Social media is in fostering confidence in and credibility for online banking services. Positive social media testimonials, reviews, and recommendations help to increase users' trust in online banking platforms. On the other hand, unfavourable opinions posted on social media can harm prospective clients' trust. In order to keep a good reputation, banks must actively manage their online presence and respond to customer comments right away (Rahi et.al, 2019).

Social media channels also have a big impact on how customers use and adopt internet banking services. Social media marketing initiatives can raise awareness of and interest in internet banking services, which will ultimately lead to customer adoption. It is important to recognise that social media occasionally has a negative impact on how customers see and use internet banking services (Singh and Srivastava, 2019). Spreading false information or unfavourable attitude on social media can make people reluctant to use internet banking services. Additionally, security issues brought on by data breaches or phishing attacks on social media platforms may cast doubt on the security of online banking (Rajasulochana,2022). The significance of social media in influencing customer perceptions and utilization of internet banking services should not be overlooked. These platforms offer an exclusive avenue for customers to voice their opinions, exchange experiences, and interact with financial institutions and their products (Jaiswal et.al,2021). The convenience of access and immediate communication provided by social media have fundamentally altered the way customers engage with banks and financial service providers.

RESEARCH GAP

While existing literature has explored the impact of social media on various aspects of customer behaviour in the banking industry, there remains a notable research gap in understanding the specific role of social media in shaping customer perception and usage of internet banking services. Despite the growing significance of social media in the banking sector, empirical studies that directly examine the relationship between social media interactions and customer perception of internet banking services are scarce. Examining the influence of social media on internet banking can provide valuable insights can guide banks and financial institutions in formulating effective social media strategies and optimizing internet banking services to cater to the diverse needs and expectations of customers.

RESEARCH OBJECTIVE

- To explore the relationship between social media engagement and the adoption and usage of internet banking services among customers.
- To identify the impact of positive and negative content on social media platforms on customer perceptions and trust in internet banking services.

RESEARCH HYPOTHESIS

H1=There is significant relationship between social media engagement and the adoption and usage of internet banking services among customers.
H2=There is significant impact of positive and negative content on social media platforms on customer perceptions and trust in internet banking services.

RESEARCH METHODOLOGY

For the purpose of this research purposive sampling technique was used. A structured questioner was prepared using Google form and was circulated among the users of internet banking in Balangir district of Odisha. The questioner was divided into two parts. The first section focused on social media usage, including questions related to the types of social media platforms used, the frequency of interaction with banking-related content on social media, and the level of engagement with such content. This section aims to assess the extent to which social media plays a role in influencing customer perceptions of internet banking services and the second section of the questionnaire concentrated on customer attitudes towards internet banking services. A total of 195 responses were received out of which 22 responses were discarded as they were incomplete.173 responses were considered for the purpose of this study. The data collected was analysed using SPSS.

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DATA ANALYSIS

Table-1, Demographic profile of the respondents

Demographic variable		Frequency	Percentage
Gender			
	Male	100	57.9
	Female	73	42.1
Age			
	20-30	24	14.2
	30-40	90	51.6
	40-50	59	34.3
Education			
	College Student	24	13.7
	Undergraduate	88	50.8
	Postgraduate	61	35.5
Hours of using social media			
	Less than 3 hours	52	30
	3 – 6 hours	87	50
	More than 6 hours	35	20
Commonly used social media			
	Facebook	78	45
	Twitter	36	21
	Instagram	59	34

Table 1 displays the demographic information of the participants, who were using internet banking services involved in this study. A total of 173 respondents (42.1% female; 57.9% male) took part in the experiment and successfully completed the experimental survey. The data collected encompassed variables such as gender, age, highest academic qualification, and occupation. As anticipated, the participants were highly educated, with a significant portion holding academic qualifications. In particular, 13.7% of the population were in college, 50.8% had finished their undergraduate degrees, and 35.5% had pursued postgraduate study. Regarding hours of using social media, majority of the respondents used social media for 3 to 6 hours(i.e.50%). The most popular social networking site among the respondents was found to be Facebook.

Table-2, Cronbach Alpha Reliability Test

Cronbach's Alpha	N Of Items
.867	**25**

A reliability test, referred to as a statistical analysis, is utilized to gauge the reliability and consistency of measurement devices or constructs. This test assesses how dependable and stable the items or questions on a measurement scale or instrument are in producing consistent results. The evaluation of construct reliability was conducted using SPSS software. The obtained Cronbach's alpha value in this test was found to be .865, indicating a satisfactory level of reliability. This result confirms that the measurements are accurate and provides evidence supporting the reliability of the collected data.

Table-3, Results of Regression Analysis (Model Summary) for hypothesis-1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.775[a]	.601	.583	.824

a. Predictors: (Constant), Adoption of internet services

The analysis shows that this model accurately explains 60% of the impact that social media has on the dependent variable, which is the adoption of internet services. This conclusion is supported by the Adjusted R square value of 0.583, indicating a substantial relationship between the adoption of internet services and the influence of social media. The regression model's R coefficient of 77% further confirms this, suggesting that the model explains a significant portion of the overall variance.

Table-4, Results of Regression Analysis (ANOVA) for hypothesis-1

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.497	1	22.497	33.152	.000[b]
	Residual	14.929	22	.679		
	Total	37.426	23			

a. Dependent Variable: Social media

b. Predictors: (Constant), Adoption of internet services

The ANOVA results indicate that the probability value obtained was extremely low, specifically .000b. This result suggests that the regression model is significant, making it suitable for predicting the relationship between the adoption of internet services and the impact of social media. Additionally, the p-value |t|, at a 95% confidence level, is less than 0.05, further supporting the hypothesis.

Table-5, Results of Regression Analysis (Model Summary) for hypothesis-2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.860[a]	.739	.710	.543

a. Predictors: (Constant), impact of content customer perceptions and trust

The analysis shows that this model accurately explains 73% of the influence of positive and negative content on social media platforms on customer perceptions and trust in internet banking services. This conclusion is supported by the Adjusted R square value of 0.710, indicating a strong relationship between the variables. The regression model's R coefficient of 86% further supports this assertion, demonstrating that the model explains a substantial portion of the total variance. Moreover, the R Square value of 73% reinforces the model's ability to account for a significant proportion of the overall variability.

Table-6, Results of Regression Analysis (ANOVA) for hypothesis-2

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.527	1	7.527	25.512	.001[b]
	Residual	2.655	9	.295		
	Total	10.182	10			

a. Dependent Variable: Social media

b. Predictors: (Constant), impact of content customer perceptions and trust

Based on the ANOVA results, the calculated probability value was extremely low, specifically .000b. This suggests that the regression model is highly significant, making it appropriate for predicting the relationship between the impact of positive and negative content on social media platforms and customer perceptions and trust in internet banking services. Furthermore, the p-value |t|, at a 95% confidence level, is less than 0.05, providing additional support for the hypothesis.

RECOMMENDATION

- Banks should actively interact with their consumers on social media channels by responding to their questions and concerns in a timely manner.
- Collaborate with brand ambassadors or social media influencers to promote internet banking services. Influencers are a powerful tool for spreading messages and expanding the reach of marketing efforts.
- Keep an eye out on social media channels for complaints from customers about internet banking services.
- Launch social media campaigns to inform users about the ease of use and convenience of online banking services.
- Actively seek out consumer comments on social media platforms to learn more about how users feel about using internet banking services.

CONCLUSION

The emergence of Internet banking has transformed banking globally. However, the integration of social media and digital technologies has radically changed how companies interact with their customers in recent years. The purpose of this study was to investigate at the association between the customer adoption of internet banking services and social media engagement.The study's findings offer significant insights on the influence social media has on consumer attitudes towards online banking services. According to the study, consumer perceptions of online banking services might be positively or negatively impacted by the content posted on social media sites. Positive content may encourage confidence and trust in these services, while negative content can create distrust. These results underline the importance for banks and other financial institutions to actively manage their social media presence. They can improve consumer impressions and foster trust in their services by pushing positive material and responding to negative criticism in an appropriate manner.

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OPPORTUNITIES OF CYBERSPACE IN THE ORGANIZATION AND MANAGEMENT OF MODERN EDUCATION

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ABSTRACT

In this article, the need to further improve the mechanisms of organizing education and training and make changes to its management method based on modern requirements is emphasized, the cyberspace factor is emphasized in revealing the essence of the problem, and the concepts in this direction are analyzed. The trends of correlation between the results obtained in the research process were analyzed through the law of moving from individuality to generality and from generality to particularity, and scientific-theoretical proposals and recommendations were developed through the conclusions of the research process.

KEY WORDS: *theory of education and training, cyberspace factor, educational platform, educational process, electronic education, virtual education, information and communication technologies, educational modernization, personalized education, cyberspace techniques, computer technology.*

INTRODUCTION

The development of the 21st century cannot be imagined without information technology. This factor (cyberspace), which has arisen as a practical result of human potential, raises many issues in the development of mechanisms for the organization of education and training or its management. In this sense, we can say that today's education and training processes are undergoing a serious transformation. In particular, the continuity of the state policy in the field of education in Uzbekistan and the fact that the education system is based on a strict principle that supports the child in every way from birth to the age of 30 make it a worthy place in life. It is not in vain that our efforts are aimed at creating a comprehensive and continuous education and training system, which helps to find. Because in developed countries, great attention is paid to investing in the full cycle of education, that is, in the education of a child from 3 to 22 years old. It is also true that over time, this investment will bring 15–17 times the benefit to society[1.224]. The conclusion from this is that the stability of education and training depends to a large extent on the main reform of the state, in which the organization and management of education and training are a constructive basis.

REVIEW OF THE LITERATURE ON THE TOPIC

The factor of cyberspace, which entered as a revolution of the 21st century, brought a comprehensive modernization stage to the process of organization and management of education, like all spheres of society[2.606]. The concept of "digital education" is rising to the level of a trend in the improvement of the education and training system[3.397-412]. Research aimed at evaluating the potential of cyberspace for educational effectiveness is also being conducted[4]. Scientific conclusions[5.423-427] indicating the need to ensure the integrity of education and training and attempts[6.527-541] to develop its prospective strategy are being researched by the scientific community. However, no sufficient conclusions have been reached regarding the modification of modern education and training and its implementation. Therefore, it was aimed to conduct research within this topic.

RESEARCH METHODOLOGY

In this research, the statistical data are compared and analyzed, and the obtained scientific theoretical data are interpreted in a practical way in a correlational way. This, first of all, allows to identify the social factors that are an obstacle to the development of education and upbringing and to understand the interrelationship between them; secondly, it leads to clarification of the prospective elements of the problem. For this reason, we aimed to find the mechanisms that lead to education and training based on national mentality at a time when modern cyberspace is developing through this method.

ANALYSIS AND RESULTS

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As much as it is a complicated issue to ensure the integrity of education and upbringing, it is a problem to adapt the technologies of «weaponizing» it organizationally to the new era. However, as today's development cannot be imagined outside of cyberspace, there is no other way to modernize the management system aimed at increasing the effectiveness of education and training based on the possibilities of cyberspace. In this sense, in the following years, a number of scientific conclusions aimed at effective use of cyberspace opportunities in improving the effectiveness of the organization and management system of education and upbringing will be put forward. Below, we will consider the ideas presented in some of these scientific concepts.

In her research, Russian scientist N.V. Grechushkina analyzes the models aimed at creating an “educational platform” that brings about the integration of education during the digitization of the field of education in the cyberspace range, the organization of online courses, and explores the perspectives of the organization and management of education and training. The researcher focuses more on online education management and finds inconsistencies between different approaches to defining online course integration models in domestic and foreign scientific pedagogical literature, dividing them into three generalized criteria. These are:

1) The organization of the educational process (the need to organize an online course for the educational process, the method of organizing the educational process);
2) The necessity of categorizing traditional and online components of the educational content (changing the structure of the educational process, teaching forms, and methods);
3) The mechanism of determining the interaction of subjects in the educational process (organization of pedagogical support, determining the pedagogical interaction of subjects). This approach allowed us to analyze thirty-four[7.120-130] models for the implementation and integration of online courses, suggesting the following factors underlie this problem:

- The emergence of the obligation to switch to distance education in the context of the COVID-19 pandemic, first of all, created the need to introduce electronic learning technologies in education. Second, it showed that there is no single (internationally recognized) management mechanism for the organization of online courses;

- The integration of online courses is largely due to economic costs. For example, the instability of the price of the provided educational services, the lack of profitability between them, the improvement of the quality of education, the limited material and technical base, and problems related to the provision of personnel are the main problems in the integration of the organization of online education[8].

According to Siti Hajar Halili, a scientist from Malaysia, the student's use of technological advances in teaching young people is to strengthen the learning process, arouse interest in students' participation in educational materials, and strengthen the phenomenon of digital education.

The professor suggests paying attention to the following factors when organizing and managing the virtual education process:

1. The mechanism of using technological advances in teaching should be changed;
2. It is necessary to widely introduce technological advances in 3D format into the educational process;
3. It is necessary to increase the student's ability to use virtual reality, cloud computing, holograms, biometrics, multi-touch LCD displays, databases (on the internet), and artificial technologies;
4. Four components should be prioritized in distance education. The first is to organize multilevel collaboration and manage the learning process using charts and a smart board. The second is the training of specialists such as pedagogy and cybergogics in the management of educational activities. Thirdly, higher educational institutions should be prepared for the online education system in two ways (students and teachers) while supporting innovations. Fourthly, it is necessary to develop a mechanism for not falling into the sphere of influence of cyberspace while using[9.63-69] technological advances in the teaching process, and to implement it step by step.

The basis of Hajar Halili's concept is the organization of the educational process in higher education and its remote management.

The importance of the ideas put forward by the researcher can be evaluated as follows:

First, to speed up the learning process, improve students' ability to learn online, control the occasional tasks of teachers, and allow them to devote more time to providing meaningful distance learning for students. can be achieved.

Secondly, it provides a convenient opportunity to find negative factors affecting the quality of education, to facilitate the exchange of information between institutions and students located in different regions, and to evaluate the knowledge of students, that is, to analyze how well they learn subjects.

Thirdly, showing the unique method of improving the education system using the example of “Malaysian education”, using advanced technologies in the teaching process, leaving the traditional approach to education and upbringing of students, and using non-traditional methods It is also important that the effectiveness of management of educational processes be shown on the basis of conclusions obtained from practical results.

The concept of “pathology of education in cyberspace”, put forward by the Australian researcher Syed Hodi Sadeghi, has a special place in the opening of virtual educational opportunities. He evaluates virtual education as follows:

- cyberspace has become a virtual place where people interact with others as in the real world;
- in cyberspace, like in the real world, there are some rules, restrictions, opportunities, training, and instructions;

- the process of virtual education is considered an important event in human social life, and today it has been combined with the improvement of technology and a modern lifestyle;

- educational needs are diverse and widespread, and they are met in different ways. For example, following the development of information and communication technologies and the formation of cyberspace, the demand for virtual or online education is increasing;

- any conscious, rational, and effective activity is determined by its intentions and tasks. Education as an activity also has specific objectives, and the pursuit of education in any subject or course is associated with some goals and objectives, which are carried out to meet specific needs and achieve specific goals[10.39-53]. His conclusion was that it does not matter in what form we receive education. It is important how we intend to get it. Therefore, the pursuit of education using the opportunities of cyberspace can only be beneficial.

Scientific and theoretical conclusions of the researcher[11]:

1) In the past, the educational network was limited only within the family; today, the expansion of communities and the formation of qualitative changes have caused a change in the network of education and upbringing compared to the past;

2) Technology has always helped mankind and helped him improve work and increase efficiency;

3) The form or category of education in cyberspace did not escape the attention of mankind, on the contrary, it was strengthened with the development of everyday technologies;

4) Educational modernization has transformed itself into the use of technology, even creating new forms that lead to the displacement of traditionalism;

5) As a result of the evolution of society and the growth of human needs, various forms of education have been technologically improved.

According to the results of the research conducted by professors Nasser Alalwan, Ahmed Alzahrani, and Mohamed Sarrab of Sultan Qaboos University, the “internet” - a new era of online education has started. This space (cyberspace) became the basis for the opening of new opportunities for information and communication technologies. That is, it ensured the integration of students from different regions of universities. Therefore, there is a growing tendency to look at online education as the “education of the future”. First, it creates an opportunity to use modern technologies to provide new ways of learning, teaching, and learning, which is the main goal of educational systems organized in cyberspace. Second, computer-friendly learning devices have proven to be significantly different from traditional learning systems. Thirdly, various hand-held devices that are tools in the online learning environment, such as smartphones, have increased educational options by allowing access to Internet services anywhere through mobile communication.

The organization of an online educational platform in the concept put forward by this team leads to the opening of the following opportunities in the management of education:

1) In the psychology of increasing the flexibility of classrooms, mobile computing, and communication devices, teachers and students create new opportunities for mutual cooperation;
2) It can enhance student-centered learning through the system;
3) By increasing student flexibility, it creates conditions for accessing online content anytime, anywhere;
4) Gives the student an excellent opportunity to practice at the time he wants;
5) Supports the differentiation of students' educational needs;
6) Students' control becomes freer;
7) It becomes easier for the teacher to manage the student's educational activities;
8) The student is managed effectively;
9) Responds to different types of learning (learning styles);
10) The options for the student to study reading, writing, video, animation, collaboration, discussion, listening, exams, and knowledge are expanded;
11) The student will be able to collect evidence easily with the help of writing, audio, or video, making it possible to use it more effectively;
12) Receiving or providing online training is cheaper than providing the necessary resources for face-to-face training;
13) Reducing cultural and communication barriers between professors and students by using communication channels that students like;
14) Through personalized training, in which the user can be allowed to carry out training on his personal device;
15) Improves social learning and removes technological barriers[12.755-758].

Professor Job Bebenimibo from Nigeria evaluates the possibilities of “cyber education” in terms of facilitating students' education as follows:

first, cyberspace techniques are established as a useful skill in the human mind and deepen the knowledge that students can acquire in higher education institutions, allowing them to master them;

second, the knowledge or skills acquired in cyberspace are necessary for our wider understanding of problems in real society, for developing advanced ideas aimed at solving them, and for promising a better society for the next generation;

thirdly, the unique technological conditions created in the cyberspace increase opportunities in higher education and improve the professional skills of young people;

fourthly, trends in cyber technology create a “revolutionary” turn in human consciousness, creating low-cost but high-benefit opportunities for solving social problems in society;

Fifth, as a result of the artificial intelligence education system, various virtual space techniques (programs) aimed at global teaching and mastering are taking a perfect place in cyberspace as a beneficiary[13.94].

As a result of the development of online education, a person has gained the opportunity to learn for life, says Bulgarian professor Krasimir Sripov. In the object of his scientific research, what is the purpose of learning during human life? How do you plan and manage learning? How do you implement the results of your knowledge? Why should one engage in lifelong learning? How does this relate to economic development and personal success? Simply put, is lifelong learning the only key to meeting the needs of a skilled workforce? raises questions such as these and promotes virtual education (lifelong education)[14.245-247] services to meet the personal needs of a person.

In the concept presented by K. Sripov, the following comments are made:

- in cyberspace, which has become popular since the beginning of the 1990s, changes in many professions and “must-have” new competencies to adapt to today's fierce competition are being promoted;

- with the rapid development of computer technologies, software capabilities, and the Internet, distance education provides powerful, user-friendly online training manuals and cyberspace educational resources;

- in the traditional educational system, the educational process should be compatible with the student's schedule. It limits the age, time, and circumstances of the learner. These problems are solved through “lifelong education”. For example, most of those enrolled in this type of education have already graduated from high school or have obtained a university degree, and they access the «lifelong learning» platform because they know that if they stop studying, they will lose their competitive advantage. those who Because it is natural that any educational system provides unlimited opportunities to citizens and encourages them to continue their studies and professional growth;

- the use of cyberspace for education means that all components of the didactic system should be launched in cyberspace;

- according to the definition of online education, it is the organization of the learning process while the teacher and the student are far from each other. Therefore, any educational cyberspace management should be equipped with the following technological tools:

a) tools for creating and editing educational material;

b) educational process planning and management tools;

c) means of delivering educational material to students and means of teaching through dialogue;

d) tools for checking and evaluating students' skills[15.245-247].

In the concept of K. Sripov, the possibilities of cyberspace are linked to the educational platform, and its importance as a technical device is emphasized more. Of course, this is true from one point of view. Because cyberspace appeared as a result of the development of computer technologies, But the second side of the issue should not be ignored, namely, that the globalization of education (cyber integration) has affected factors such as satisfying individual interests, increasing access to education, reducing distance imbalance, and reducing economic costs. The conclusion is that education and training are processes related to the stability of the organizational structure and the breadth of management.

1. It is necessary to pay attention to the “transfer of education” simultaneously with the possibilities of organizing comprehensive education and training, which are coming after globalization. Because in the cyberspace of education and training, the cross-border area is uncertain, and it (the education and training method, organizational mechanisms, and management apparatus) is naturally more likely to be deformed when it collides with internal and external interests. In this regard, scientists such as Bruner Robert and Juliane Iannarelli express the following opinion: today, on the basis of actions directed toward education, in most cases, global trends developing in business are decided. Among them, one can see goals such as meeting personal needs and maintaining management control. In this regard, the main areas to be focused on are improving the quality of education on a global scale, guaranteeing it, expanding organizational mechanisms, developing and managing educational programs[12.232-242] in international partnerships, and the internationalization strategy as a whole.

Therefore, the organizationally correct organization of interregional “educational transfer” is necessary, firstly if it corresponds to the national interests and the national mentality of the nation, and secondly if it is suitable for a certain stratum of the population (students from underdeveloped or developing countries). also has a positive effect on the tendency toward stratification.

2. It is recommended to give special emphasis to democratic principles in the organization of education and training management. It is a historically proven fact that organizing an educational system without taking into account their psychological experiences and mental-emotional uniqueness does not give effective results since there are minors in the education and training facility. Therefore, organizing the process of education taking into account the national mentality, strictly following democratic principles in directing them to education, and “modernizing education management” depending on the need is the most correct way leading to the expected results. is considered The Brazilians Daniela Patti do Amaral and Ana Cristina Prado Oliveira, who conducted deep scientific research in this regard, obtained the following results:

- democratic management in education - is the basis of the democratization of society, in which it will be possible to develop a political-pedagogical project of education and manage educational processes. In particular, if such a management

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system is organized in a virtual form, its efficiency will increase even more. Because the desire for online education is increasing for the majority of school-age students;

- the concept of cyber education on the principle of democracy is seen in the context of micro and macro education. For example, the organization of online debate depends on its macro units of measurement, which in turn are reflected in public administration. Therefore, the organization of democratic politics arises from the characteristics of each subject;

- the democratic management of education depends on the experience of the educational institution, and all the work[17] towards democratization is very necessary in the current educational scenario.

3. As a result of the development of cyberspace, the possibilities of "digital education" are becoming functional and serving human interests. This is definitely a positive situation that comes after digital technologies in personal development. Because today, a person can enjoy online education courses using a simple smartphone. From this point of view, there is less disruption in the educational process following the increased integration of cybereducation. The following considerations can be cited as a basis for this:

First, the change of attitude towards education under the influence of cyberspace led to the popularization of such concepts as "digital student", "digital knowledge" and "digital employment";

Second, modern information technologies have become part of the daily education of young people;

Third, virtual education has become a platform that allows the simultaneous use of different methods to educate different types of students. For example, knowledge can be acquired and disseminated in different ways[18]. Most importantly, they are being transformed on the basis of modern technologies. In particular, it would be correct to say that the main plan is to organize the possibilities of interdependence, communication, and cooperation.

The fact that cyberspace has an unlimited geographical area and no layer is left out of its sphere of influence provides many opportunities for organizing, managing, or establishing a control form for organizational issues aimed at the effectiveness of education and training. In particular, the invention of optical communication means, digital technologies, and the development of remote transmission infrastructure changed the public's opinion on the introduction of mechanisms for education, its delivery, and effective education. Territorial boundaries, which existed especially in the educational transformation, have disappeared, and the ground has been created for the introduction of information and communication technologies that serve the interests of the individual.

The following can be added to the unlimited possibilities of cyberspace in organizing and managing the education and training process:

- the fact that all types of propaganda methods are not free from the "encirclement of the information society" means the global impact of cyberspace;

- the transfer of any information in a short period of time: the expansion of the possibilities of its consumption in a person shows the infinity of the information space, which is a factor of cyberspace;

- the space of cyberspace made it possible to use all the factors beneficial to a person at a high level. With its help, it led to the introduction of ideas affecting education and training into practical activities, the production of theoretically based experiments, and the discovery of paths leading to the world of infinity (virtual life) through virtual reality or the Internet.

- the greatest possibilities of cyberspace are that it has the power to keep objective reality within its sphere of influence, to organize and manage all directions of social life, as well as to control the inner mental-emotional state (world) of a person, which makes the phenomenon of cyberspace show leadership in community management. For example, if we take the theory of education and upbringing, today's "educational migration" is a vivid example of this.

In addition to the above-mentioned points, the following **conclusions and suggestions** can be made:

First, the trends of cyberspace, which have entered through information technologies in the 21st century, connect the effectiveness of education aimed at the maturity of young people to the stability of education received in the family, neighborhood, and social environment. This, in turn, shows that the gradualness of education depends on the quality of education provided. Because the possibilities of cyberspace create conditions for young people to receive education that their parents do not give them from virtual courses, lectures, or other forms of "artificial intelligence". Or, on the contrary, it is gaining access to a diverse database through cyberspace.

Secondly, the socio-cultural image of the world is changing under the influence of cyberspace. For example, it is no longer necessary to travel around the world to gain knowledge. On the contrary, "online movement" is enough to study in the most prestigious universities or colleges-lyceums of the world. In other words, through cyberspace services such as online courses, distance education, and virtual communication, we are creating the necessary "knowledge-skills-qualifications".

Third, the development of information technology − technical communication, transformational integration, two-way movement, online communication, virtualization of education and training, the creation of a virtual space between students and teachers, creating feedback, increasing information exchange, and cyberspace − is explained by such factors as the expansion of the sphere of influence.

Fourthly, in the improvement of the mechanisms of organization or management of the education and training process, cyberspace is a field of data digitization, a repository of limitless information arrays, a technology for controlling human psychology through virtual reality, a "factory" for creating artificial perception, and a service for coding the source of knowledge. "Organizing, managing, and controlling" such processes has become a system with complex, stable development dynamics.

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Fifth, the creation of computer technologies, followed by the invention of the Internet, became one of the most important realities that changed the lives of mankind. Because of these signs of development, the phenomenon of cyberspace has spread throughout the world. Cyberspace is a reality that allows a person to move freely, use any information independently, exchange information in various forms, connect to global communications, integrate parts into a whole, gather social layers into a virtual audience regardless of geographic location, and reveal the boundaries that have been determined by the human factor for thousands of years of performing his duties.

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A STUDY OF DRUG UTILIZATION AND COMPARATIVE PHARMACOECONOMIC ANALYSIS OF ANTIDIABETIC DRUGS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: *Diabetes Mellitus is a chronic metabolic disorder that is one of the major causes of morbidity and requires lifelong treatment.*
Aim and Objectives: *This study was conducted to determine prescribing pattern and frequency of single and combination antidiabetic drugs prescribed for type 2 DM and to compare their percentage cost variation.*
Materials and Methods: *This was a prospective observational study carried out among in-patients of the general medicine department of a tertiary care hospital for a period of 6 months.*
Results: *A total of 246 subjects were analyzed showing the main age group was between 60-70 years (28.9%). Polypharmacy was evident in the study as 178 (72.4%) prescriptions had greater than 5 drugs. Metformin 500mg in 38 (33.04%), Metformin 500mg + Glimepiride 2mg in 36 (25.35%) subjects and Insulin soluble 30% + Isophane 70% were the most prescribed single, combination, and insulin preparation respectively. The highest percentage cost difference was seen with Vildagliptin 50 mg (72.88%) out of 15 single antidiabetic drugs, Metformin 500mg + Dapagliflozin 10mg (79.93%) out of 20 combination antidiabetic drugs and Insulin soluble 30% + Isophane 70% (28.28%) out of 6 insulin preparations.*
Conclusion: *Oral dosage form was the most prescribed and there is inclination towards prescribing combination therapy. The study concluded that inclusion of generic drugs to the therapy will be economical for the patient, as it can reduce the wider price variation of antidiabetic drugs by different brands available in the hospital pharmacy.*
KEYWORDS: *Type 2 Diabetes mellitus, Anti-diabetic drugs, Drug utilization study, Polypharmacy, Comparative Pharmacoeconomics analysis, Cost analysis.*

INTRODUCTION

Diabetes mellitus (DM) is a group of metabolic disorders characterized by hyperglycaemia and abnormalities in carbohydrate, fat, and protein metabolism.[1] It may result in chronic microvascular, macrovascular, and neuropathic complications.[1] It is an important public health problem in developing countries.[1] As per World Health Organization (WHO), around 31.7 million individuals in India were affected by diabetes during the year 2000 which may further rise to 79.4 million by the year 2030.[2] The prevalence of type 2 diabetes mellitus is major among Indian individuals.[2] Diabetes mellitus (DM) is a chronic disorder emerging as a major health problem which increases the rate of morbidity and mortality. Poor management of this disorder leads to several complications.[2] Management of type-2 DM requires both pharmacological and non-pharmacological interventions.[2]

Drug utilization study of antidiabetic agents is of paramount importance to promote rational drug use in diabetes and make available valuable information for the healthcare team. This study is therefore aimed at determining the pattern of drug prescription among type-2 diabetic patients to evaluate the degree of physician's compliance to current evidence and clinical guidelines and analyze the prescription according to WHO core drug prescribing indicators.[2]

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Pharmacotherapy for a chronic disease like diabetes has substantial economic implications for patients, especially in a developing country like India.[3] Only efficacy may not justify a drug choice for long-term therapy as the cost factor is equally important.[3] Similarly, an apparently costlier drug or therapeutic regimen may also turn out to be a good choice when seen in the context of efficacy and tolerability.[3] So, it is important to scientifically evaluate the cost of practiced antidiabetic agents in the management of type 2 diabetes mellitus.[3]

Rational prescribing indicates that "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period, and at the lowest cost to them and their community." It is demonstrated by drug utilization studies. Drug utilization as defined by WHO is, prescribing, dispensing, ingesting, marketing, distribution and use of drugs in society, with special emphasis on the resulting medical, social and economic consequences.[17] These studies are important as they help to scrutinize newer drugs in the market, analyze the wide variation in the patterns of drug prescribing and consumption, address the concerns about delayed ADRs, and examine the increasing costs of drug/therapy.

A pharmacoeconomic study thus becomes necessary to throw light on the current approaches to the rational use of anti-diabetic drugs in type 2 diabetes mellitus patients visiting the medicine in-patient department and to calculate the economic burden of different anti-diabetic therapies prescribed to patients with type 2 diabetes mellitus. Knowledge of costs related to diabetes helps to improve understanding, addressing health care and prevention issues associated with diabetes.

There are many antidiabetic drugs available for the treatment of type 2 diabetes mellitus and hence to manage diabetes mellitus effectively, the illumination of current knowledge about the pattern of antidiabetic drug utilization is important. As numerous brands are available for each of the individual antidiabetic drugs, a study was planned to evaluate cost variation among different brands of the same active antidiabetic drug. Therefore, the present study was planned to evaluate the drug utilization of antidiabetic drugs and conduct a comparative pharmacoeconomic analysis of the antidiabetic drugs in in-patients of a tertiary care hospital.

METHODOLOGY

The study was conducted as a prospective observational study on in-patients of the general medicine department in a tertiary care hospital from between December 2021 to May 2022, that focused on the evaluation of drug utilization and comparative pharmacoeconomic analysis of anti-diabetic drugs in type 2 Diabetes Mellitus patients. A total of 246 diabetic patients were included with a confidence level of 95% with a margin of error ± 5%.

By using the equation of estimation of single proportion, the sample size (n) was determined.

$$n = \frac{Z^2_{1\ \alpha/2}\ P(1-P)}{d^2}$$

were, α = Level of significance, d = Precision and P = Anticipated proportion.

In our study 95% confidence interval is considered and the expected error is 5%.

Hence,

$$n = \frac{(1.96)^2\ 0.8\ (1-0.8)}{(0.05)^2} = 246$$

Thus, a sample size of 246 is used in our study.

Ethical Approval

Ethical committee of the institution approved the study and official consent was given for the purpose of performing the study. It was certified by the Institutional Ethics Committee and the proposal of the study was approved by them as per letter no: KAS:ADM: IEC: 062:22 on 30th March 2022.

A data collection form was prepared and validated to collect the information required for the study. The following information was gathered: Patient demographics, patient admission reasons, past medical conditions, past medication details, provisional diagnosis, vital parameters, lab reports, pharmacotherapy, discharge medication, antidiabetic drug details, and pharmacy bill details.

Patient's case report was initially analyzed and then the subjects for our study was selected according to the inclusion and exclusion criteria in a consecutive manner until the target sample was completed. We collected information from diabetic patients who are aged 18 years and above from inpatient department and were prescribed at least one oral hypoglycaemic agent or insulin. While those without antidiabetic medication therapy and those with incomplete data or records, gestational diabetes, malignancy, any major surgical interventions in the previous 3 months, and psychiatric disorders were excluded from this analysis. Then the required details were recorded on the data collection form. After that according to the patient MRD No. the billing details were collected from the pharmacy.

The filed patient profile form was analyzed for various parameters and the required demographic details of the patient were entered in the data collection form then the DUE of antidiabetic drugs was performed. The data included the total number of drugs in one

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prescription, number of antidiabetic drugs prescribed in patient, total number of single antidiabetic drugs prescribed, types of single antidiabetic drugs prescribed, number of combination drugs prescribed, types of antidiabetic drugs combinations prescribed, number of insulin preparations prescribed and the types of insulin preparations prescribed.
Based on the billing details, the maximum and minimum price per tablet or vial (Rs) of each antidiabetic agent were found and then the cost difference was calculated.
The percentage variation in cost was calculated by using the formula;
Percentage cost variation =

$$\frac{\text{Cost of highest priced product} - \text{the cost of lowest priced product} \quad \times 100}{\text{Cost of lowest priced product}}$$

STATISTICAL TEST PERFORMED

All collected data were processed, compiled, and analyzed using Microsoft excel method and was mentioned in simple frequencies and percentages. A descriptive analysis of patient characteristics was performed. Statistical Package for Social Sciences (SPSS) software were used for analyzing the data. Chi-square / Likelihood ratio was used as the main test to correlate the data. The p-value <0.05 was considered to be statistically significant.

RESULTS

Among the total of 246 prescriptions collected from inpatients, evaluation of various variables such as gender, weight, age, and it showed that the prevalence of Diabetes mellitus was more in males (52%) as compared to females (48%). The weight of the subjects was categorized into three, 129 (52%) of patients were over 70kg, 101 (41%) comes under 50-70kg and 16 (7%) comes under less than 50kg. The highest number of single antidiabetic drugs prescribed were seen in the age group 60-70 in 71 subjects, followed by 70-80 in 65 and then 50-60 in 50. Age-wise distribution of single antidiabetic drugs prescribed was found to be statistically significant as p value<0.05 (p=0.002).

The highest number of antidiabetic drugs prescribed were prescribed for patients with hypertension which was a prevalent condition. Comorbidity and number of antidiabetic drugs prescribed-wise distribution was statistically significant as p value<0.05 (p=0.008). With 53 (60.9%) patients were prescribed less than 2 antidiabetic drugs and 34 (39.1%) patients were prescribed with 2-5 antidiabetic drugs. 90 subjects did not have any comorbidity and among them 50 (55.6%) subjects were prescribed less than 2 antidiabetic drugs, and 40 (44.4%) subjects were prescribed 2-5 antidiabetic drugs.

Among the subjects, 151 (61.4%) were prescribed less than 2 antidiabetic drugs, and 95 (38.6%) were prescribed to 2-5 antidiabetic drugs. Figure 1 shows the distribution based on the number of antidiabetic drugs prescribed.

Figure 2 shows the distribution of single antidiabetic drugs prescribed for subjects. 148 (60.2%) participants were not prescribed single antidiabetic drugs, 83 (33.7%) were prescribed 1 single antidiabetic drug, followed by 13 (5.3%) were prescribed 2 single antidiabetic drugs, 1 (0.4%) prescribed with 3 single antidiabetic drugs and 1 (0.4%) was prescribed with 4 single antidiabetic drugs per prescription.

For 38 (33.04%) subjects Metformin 500mg was prescribed, followed by Voglibose 0.3mg for 14 (12.17%) and then Glimepiride 2mg for 11 (9.57%) subjects. The least commonly prescribed single antidiabetic drugs were Glibenclamide 5mg for 1 (0.87%) subject, Glipizide 5mg for 2 (1.74%) and Metformin 1000mg for 2 (1.74%) subjects. The percentage distribution of single antidiabetic drugs prescribed is expressed in the Figure 3.

From our data, it was found that 116 (47.2%) patients were not prescribed any combination antidiabetic drugs, 118 (48%) were prescribed 1 combination antidiabetic drug, and 12 (4.9%) were prescribed 2 combination antidiabetic drugs. Figure 4 shows the distribution of combination antidiabetic drugs prescribed.

Figure 5 shows the percentage of combination antidiabetic drugs prescribed for subjects. The most prescribed combination antidiabetic drug was Metformin 500mg + Glimepiride 2mg for 36 (25.35%) subjects, followed by Metformin 500mg + Sitagliptin 50mg for 24 (16.9%) and Metformin 500mg + Glimepiride 1mg for 16 (11.27%). The least commonly prescribed combination antidiabetic drugs were, Metformin 500mg + Voglibose 0.2mg in 1 (0. 7%), Metformin 500mg + Dapagliflozin 5mg in 1 (0.7%), Metformin 850mg + Glimepiride 3mg in 1 (0.7%), Metformin 500mg + Glimepiride 2mg + Voglibose 0.2mg in 1 (0.7%), Metformin 500mg + Glimepiride 2mg + Pioglitazone 15mg in 1 (0.7%) and Metformin 1000mg + Glimepiride 1mg in 1 (0.7%) subject.
162 (65.9%) subjects were not prescribed any insulin preparations, 72 (29.3%) were prescribed with 1 insulin preparation and 12 (4.8%) were prescribed with 2 insulin preparations. distribution based on the number of insulin preparations prescribed is expressed in Figure 6.

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The most commonly prescribed insulin preparation was Insulin soluble 30% + Isophane 70% in 36 (37.89%) subjects, followed by Insulin rapid acting DNA origin in 25 (26.32%) and Insulin Glargine in 19 (20%). Insulin aspartate 30/70 in 2 (2.11%) was the least commonly prescribed insulin preparation. The percentage distribution of insulin preparations prescribed is expressed in Figure 7. Percentage cost variation in cost of single oral antidiabetic medications were analyzed. The highest percentage cost difference was found for Vildagliptin 50mg (72.88%), followed by Dapagliflozin 5mg (65.61%). Pioglitazone 15mg (0%) and Glipizide 5mg (0%) had the least percentage cost difference. Table 1 shows the cost variation between highest-priced and lowest-priced brands of 15 single antidiabetic drugs.

A noticeable variation in the prices of 20 combination antidiabetic medicines which is shown in Table 2. The cost variation analysis of antidiabetic drugs used in combination therapy showed highest cost variation in Metformin 500mg + Dapagliflozin 10mg (79.93%), followed by Metformin 1000mg + Dapagliflozin 10mg (77.89%). The least percentage cost difference was found in Metformin 500mg + Dapagliflozin 5mg (0%), Metformin 850mg + Glimepiride 3mg (0%) and Metformin 500mg + Gliclazide 40mg (0%).

The cost analysis of 6 insulin preparations is shown in Table 3. Insulin soluble 30% + Isophane 70% (28.28%) showed highest percentage cost difference, followed by Insulin glargine (25.09%). There were three insulin preparations that had no cost variation, which were Insulin aspart (0%), Insulin aspartate 30/70 (0%), and Insulin rapid acting DNA origin (0%).

DISCUSSION

Diabetes a chronic condition and metabolic disease that requires multiple drug therapy and lifestyle modifications. As diabetes is usually associated with various complications like cardiovascular, neurological, and nephrological diseases, often diabetic patients are more prone to polypharmacy. Our study includes comparative Pharmacoeconomics to calculate the percentage cost variation of antidiabetic drugs.

The initial demographics which were assessed in the study population was gender distribution, in which male preponderance was seen. 128 (52%) were males and 118 (48%) were females. It is supported by another study by Nithin et al, 2017.[4] From the result, older men show higher prevalence of type 2 diabetes than older women. This may be due to larger amount of visceral fat seen in men as stated in the study by Nordstrom et al, 2016.[5]

The weight-wise distribution shows that 129 (52%) subjects who were over 70 kg were more prone to diabetes mellitus as compared to 101 (41%) subjects under 50-70 kg and 16 (7%) subjects who were less than 50 kg. This result is supported by the study by Eun Sook et al, 2018[6] in which states that, compared with the non-obese group there is a higher chance of incidence of diabetes in obese subjects.

From the age-wise comorbidity distribution of the subjects, it was observed that hypertension was the most common comorbidity, which was most seen in 87 (35.4%) subjects. Among them, 34 (47.9%) subjects fall in the age group of 60-70. A similar result was seen in the study conducted by Sandipana Pati and F. G. Schellevis, 2017[7] in which a higher prevalence of hypertension was seen in the age group greater than 60 years in about 62% of the participants.

According to our study result, the highest number of single antidiabetic drugs were prescribed for 71 subjects were seen in the age group of 60-70, followed by 65 in the 70-80 age group. 83 (33.7%) participants were prescribed with 1 single antidiabetic drug followed by 2 single antidiabetic drugs in 13 (5.3%) subjects. These findings were contrary to the study by Sudha Vengurlekar et al, 2008[8] in which the highest number of the single antidiabetic drug was prescribed for the age group 51-60 and followed by the age group of 41-50.

On reviewing the distribution of drugs prescribed according to comorbidity, polypharmacy condition was seen in 68 (78.25%) patients who had hypertension, 17 (81%) with CAD and 16 (76.2%) with CVA. Whereas the study by Indu et al, 2018[9] showed that the most common comorbid condition was hyperlipidemia (70.7%) and hypertension (47.3%) which was contrary to our study. Their study also shows that there was the minimum chance of polypharmacy as an average number of drugs prescribed was 4.72 +/- 0.11 per prescription.

Among the subjects, more than 5 drugs were prescribed in 178 (72.4%) cases and for 68 (27.6%) cases had 2-5 drugs, which indicated a higher prevalence of polypharmacy condition. This trend is like various studies conducted such as that of Habibe Inci, 2020[10] where the mean number of drugs used by Diabetes mellitus patients was 6.7+/- 2.5 and 77.9% of DM patients had polypharmacy.

In the present study, 98 (39.8%) subjects were prescribed single antidiabetic drugs. Metformin 500mg was identified as one of the most common single antidiabetic drugs prescribed in 38 (33.04%) subjects, followed by Voglibose 0.3mg in 14 (12.17%) subjects.

Whereas Glibenclamide 5mg was found to be the least prescribed single antidiabetic drug in 1 (0.87%) subject. This result can be matched with the study conducted by Moreno Juste et al, 2019[11] were Metformin 500mg was the most prescribed single antidiabetic drug in 10246 (80.3%) patients.

Most of the diabetic patients, 118 (48%) were prescribed 1 combination of antidiabetic drugs whereas 12 (49%) were prescribed 2 combination antidiabetic drugs. The most prescribed combination antidiabetic drug was found to be Metformin 50 mg + Glimepiride 2mg for 36 (25.3%) subjects followed by Metformin 500mg + Sitagliptin 50mg in 24 (16.9%) subjects. Only 1 (0.7%) subject was prescribed with Metformin 500mg + Voglibose 0.2mg indicating that it was the least commonly prescribed combination antidiabetic drug for the patients. The study by Acharya et al, 2013[12] shows the similar result that is, the most used antidiabetic drug combination was Glimepiride and Metformin in 119 (76.28%) patients.

Our study indicates that most of the study subjects, 162 (65.9%) were not prescribed with insulin, 72 (29.3%) subjects were prescribed 1 insulin preparation and 12 (4.8%) were prescribed with 2 insulin preparations. Our study also showed that, the most prescribed insulin preparation was Insulin soluble 30% + Isophane 70% as it was prescribed in 36 (37.89%) cases, followed by Insulin rapid-acting DNA in 25 (26.3%) cases. Insulin aspartate was the least commonly prescribed insulin preparation. This was like the study by Sree Navya et al, 2017[13] in which 63% of insulin preparations were Regular insulin and Isophane insulin.

Out of 15 single antidiabetic drugs prescribed for the patients, Vildagliptin 50mg (72.88%) showed the highest percentage cost difference, while Pioglitazone 15mg (0%) and Glipizide 5mg (0%) had the most minor percentage cost difference. This was unlike the study by Khadga Raj et al, 2022[14], wherein the highest percentage cost difference was seen in Pioglitazone 15mg (185.7%) and the lowest percentage cost difference was in Acarbose 25mg (117.18%).

In our study, out of 20 combination antidiabetic drugs prescribed, Metformin 500mg + Dapagliflozin 10mg (79.93%) showed the highest percentage cost difference whereas the least percentage cost difference was found for Metformin 500mg + Dapagliflozin 5mg (0%), Metformin 850mg + Glimepiride 3mg (0%) and Metformin 500mg + Gliclazide 40mg (0%). However, Mehani R et al, 2018[15] in their study reported that Glimepiride 1mg + Metformin 500mg (346%) showed the maximum cost variation while Vildagliptin 50mg + Metformin 500mg (2.33%) showed minimum variation in percentage cost.

Among 6 insulin preparations encountered in our study, Insulin soluble 30% + Isophane 70% (28.28%) shows the highest percentage cost difference, and the lowest percentage cost difference was found with Insulin aspart (0%), Insulin aspartate 30/70 (0%) and Insulin rapid acting DNA origin (0%), which is contrary to the study by Mayur et al, 2021[16]. Their study showed that the highest percentage cost difference was for Insulin Zinc 40IU (135.17%) whereas the lowest percentage cost variation was for Insulin (Human-Isophane recombinant) 40IU (1.40%).

The strength of our study is that it analyzes prices of different brands of the same drug available at our hospital pharmacy and thus helps the prescriber to select the same generic drug which is available at lower cost thereby improving patient compliance to the treatment regimen. The study can provide advantageous feedback to prescribers in order to improve their prescribing pattern.

The study has a few limitations that includes the sample size and duration of study are not adequate to conduct extensive pharmacoeconomic analysis, some miscellaneous oral antidiabetic drugs and insulin are not included in this study, and price variation found in this study cannot be generalized, as pharmacy store included were only from our hospital. All the diabetic patients who visited the hospital during the study period could not be included, only the in-patients belonging to the general medicine department were included.

Our study recommends that a greater number of oral antidiabetic agents should be covered under DPCO as it is a prevailing condition among the population and in case of noncompliance to DPCO, more stringent actions must be ensured. Physicians and pharmaceutical companies must be made aware about the wide variation in prices so that the drug cost can be controlled and be made more affordable to the patients. Physicians should be motivated to prescribe low-cost drug and should not be biased by pharmaceutical industries.

CONCLUSION

A prevalence of polypharmacy condition was seen in the prescribing pattern. Upon reviewing, the most prescribed antidiabetic drug was in oral dosage form, out of which there was more inclination towards prescribing combination therapy as compared to monotherapy and insulin preparations. Metformin 500mg was the most commonly prescribed among monotherapy. The commonly prescribed combination therapy was Metformin 500mg + Glimepiride 2mg and Insulin soluble 30% + Isophane 70% insulin preparation was commonly prescribed insulin preparations.

In summary, this study revealed that Vildagliptin 50 mg had the highest percentage cost difference among single antidiabetic drugs. For combination antidiabetic drugs, Metformin 500mg + Dapagliflozin 10mg had the highest cost variation. In the case of insulin preparations, Insulin soluble 30% + Isophane 70% had the highest percentage cost difference. The prevalence of high percentage price variation for antidiabetic drugs may be due to the availability of different brands in the hospital pharmacy.
Diabetes mellitus is a chronic illness, cost of the drug plays an important role in compliance with the treatment regimen, as it has a direct economic implication on the patient. It is important to bring awareness among physicians and pharmaceutical companies regarding the existence of wide variation in prices. The inclusion of more generic drugs to the therapy is desirable as it will be economical for the patient by reducing the wider price variation of antidiabetic drugs. Our study results can help the prescriber to select the same generic drug which is available in our hospital pharmacy at a lower cost. Thereby patient adherence to the treatment and outcome is improved.

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TABLES

Table 1: Percentage Cost Difference in Single Antidiabetic Drugs Prescribed.

Sl. No.	Single antidiabetic drugs used	Cost difference(Rs)	Cost difference (%)
1	METFORMIN 500mg	0.45	21.2
2	METFORMIN 1000mg	1.03	20.4
3	GLIMEPIRIDE 1mg	1.55	38.56
4	GLIMEPIRIDE 2mg	0.56	8.76
5	SITAGLIPTIN 50mg	0.15	0.36
6	GLIBENCLAMIDE 5mg	0.37	25.17
7	VOGLIBOSE 0.2mg	6.57	65.05
8	VOGLIBOSE 0.3mg	8.74	62.88
9	VILDAGLIPTIN 50mg	15.91	72.88
10	DAPAGLIFLOZIN 10mg	18	60
11	DAPAGLIFLOZIN 5mg	18.7	65.61
12	TENELIGLIPTIN 20mg	2.33	15.07
13	GLIPIZIDE 5mg	0	0
14	GLICLAZIDE 40mg	1.13	22.87
15	PIOGLITAZONE 15mg	0	0

Table 2: Percentage Cost Difference in Combination Antidiabetic Drugs Prescribed.

Sl. No.	Combination antidiabetic drugs used	Cost diff. (Rs)	Cost diff. (%)
1	METFORMIN 500mg + GLIMEPIRIDE 1mg	3.28	29.63
2	METFORMIN 500mg + GLIMEPIRIDE 2mg	5.2	31.51
3	METFORMIN 1000mg + GLIMIPIRIDE 1mg	4.15	32.42
4	METFORMIN 1000mg + GLIMIPIRIDE 2mg	5.8	34.65
5	METFORMIN 500mg + SITAGLIPTIN 50mg	0.02	0.074
6	METFORMIN 1000mg + SITAGLIPTIN 50mg	0.1	0.36
7	METFORMIN 500mg + GLIBENCLAMIDE 5mg	0.02	0.35
8	METFORMIN 500mg + VILDAGLIPTIN 50mg	13.56	61.92
9	METFORMIN 500mg + TENELIGLIPTIN 20mg	2.45	14
10	GLIMIPIRIDE 2mg + METFORMIN 500mg + VOGLIBOSE 0.2mg	7.06	33.49
11	GLIMIPIRIDE 1mg + METFORMIN 500mg + VOGLIBOSE 0.2mg	5.2	31.9
12	METFORMIN 500mg + GLIMIPIRIDE 2mg + PIOGLITAZONE 15mg	5.17	31.01
13	METFORMIN 500mg + GLICLAZIDE 40mg	0	0
14	METFORMIN 500mg + GLICLAZIDE 80mg	7.45	52.84
15	METFORMIN 850mg + GLIMIPIRIDE 3mg	0	0
16	METFORMIN 1000mg + DAPAGLIFLOZIN 5mg	0	0
17	METFORMIN 1000mg + DAPAGLIFLOZIN 10mg	46.58	7.89
18	METFORMIN 500mg + DAPAGLIFLOZIN 5mg	11.63	49.49
19	METFORMIN 500mg + DAPAGLIFLOZIN 10mg	45.56	79.93
20	METFORMIN 500mg + VOGLIBOSE 0.2mg	7	54.26

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Table 3: Percentage Cost Difference in Insulin Preparations Prescribed.

Sl. No.	Insulin preparations used	Cost difference (Rs)	Cost difference (%)
1	INSULIN SOLUBLE 30% +ISOPHANE 70%	0.92	0.58
2	INSULIN SOLUBLE 50% +ISOPHANE 50%	62.12	28.28
3	INSULIN GLARGINE	199.2	25.09
4	INSULIN ASPART	0	0
5	INSULIN ASPARTATE 30/70	0	0
6	INSULIN RAPID ACTING DNA ORIGIN	0	0

FIGURES

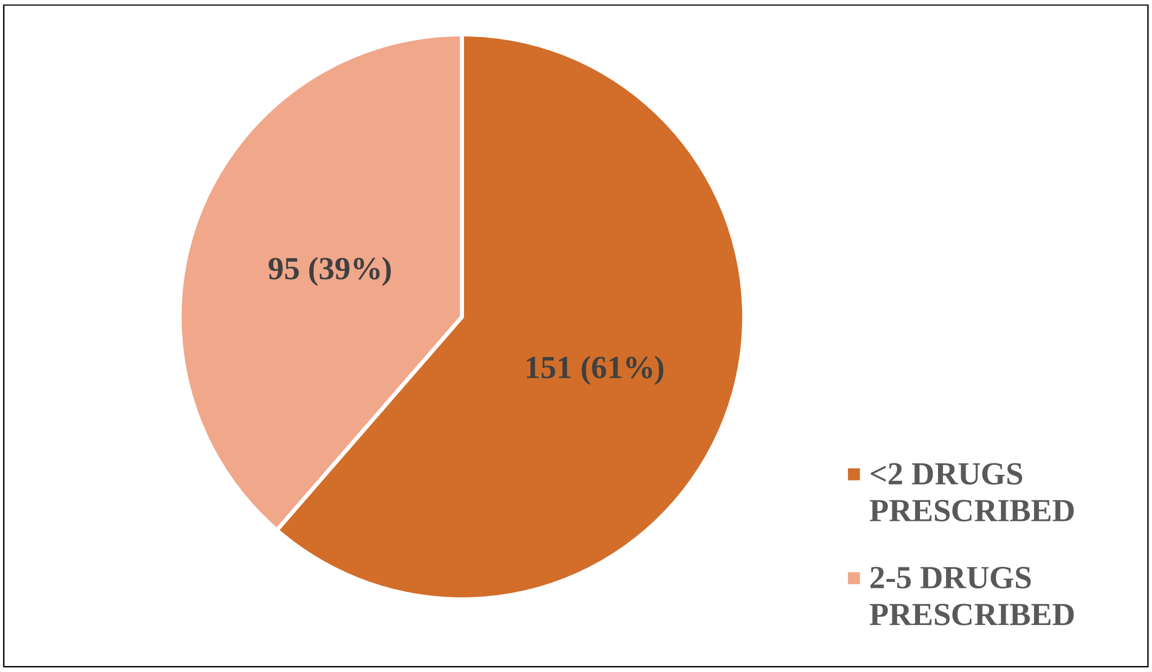

Figure 1: Distribution Based on Number of Antidiabetic Drugs Prescribed.

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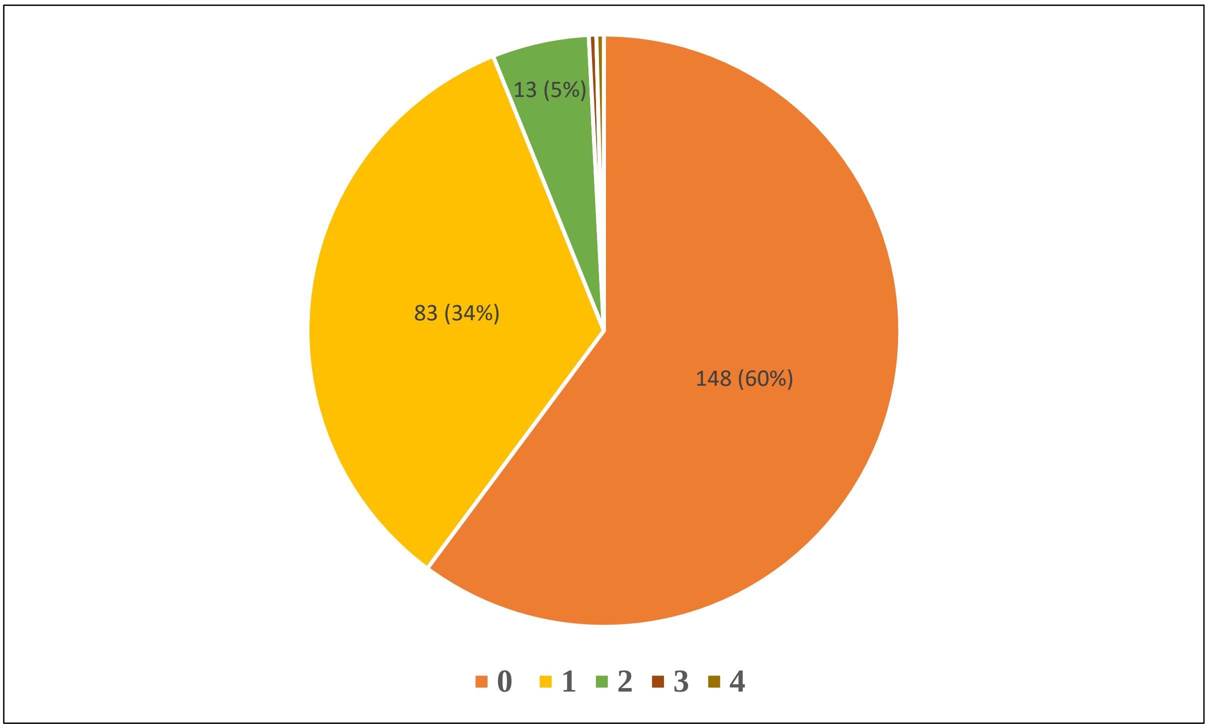

Figure 2: Distribution of Single Antidiabetic Drugs Prescribed.

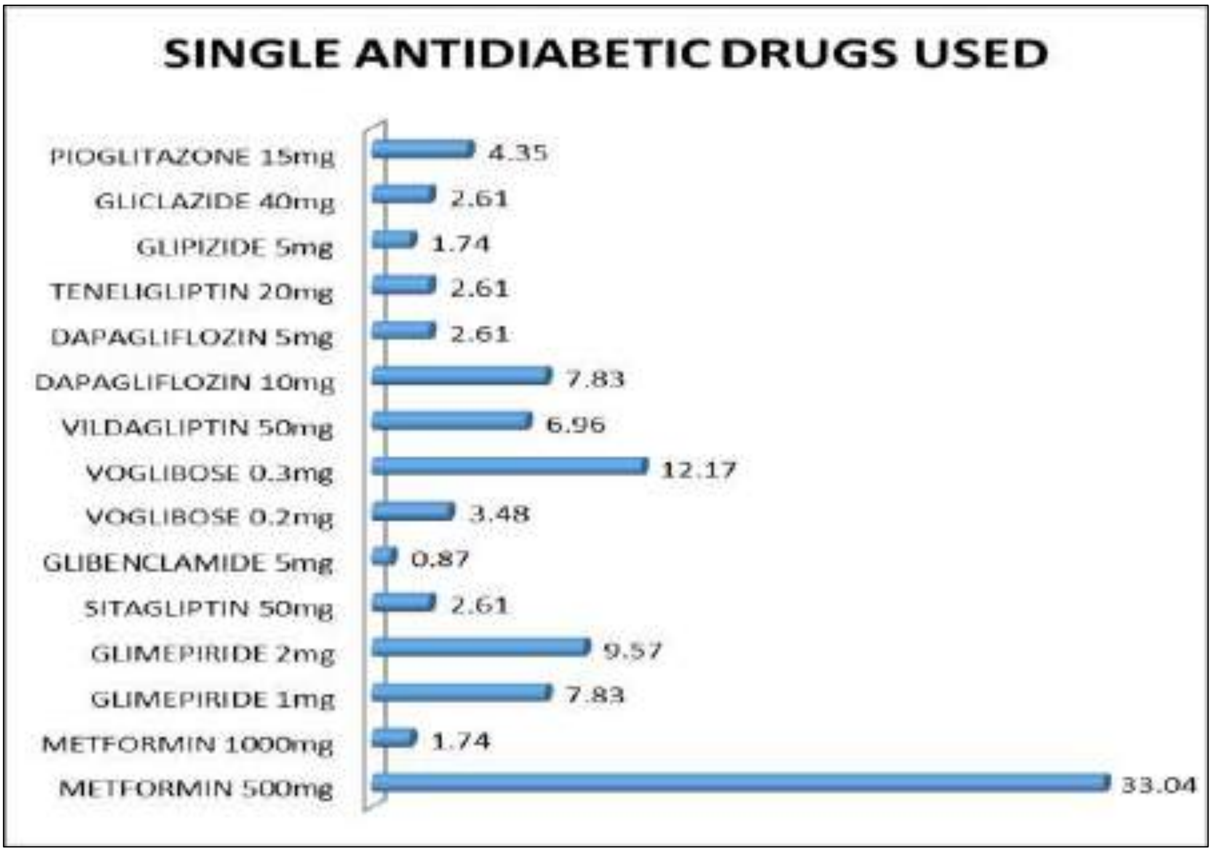

Figure 3: Percentage Distribution of Single Antidiabetic Drugs Prescribed.

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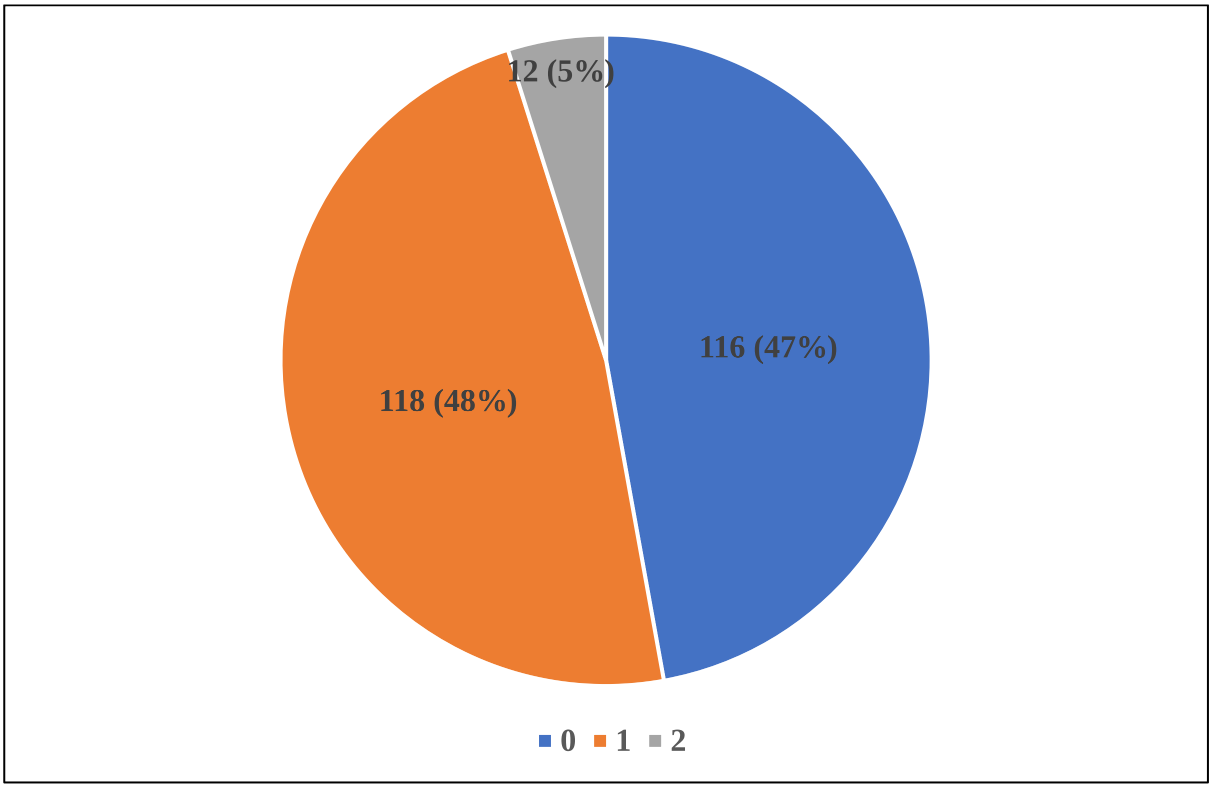

Figure 4: Distribution of Combination Antidiabetic Drugs Prescribed.

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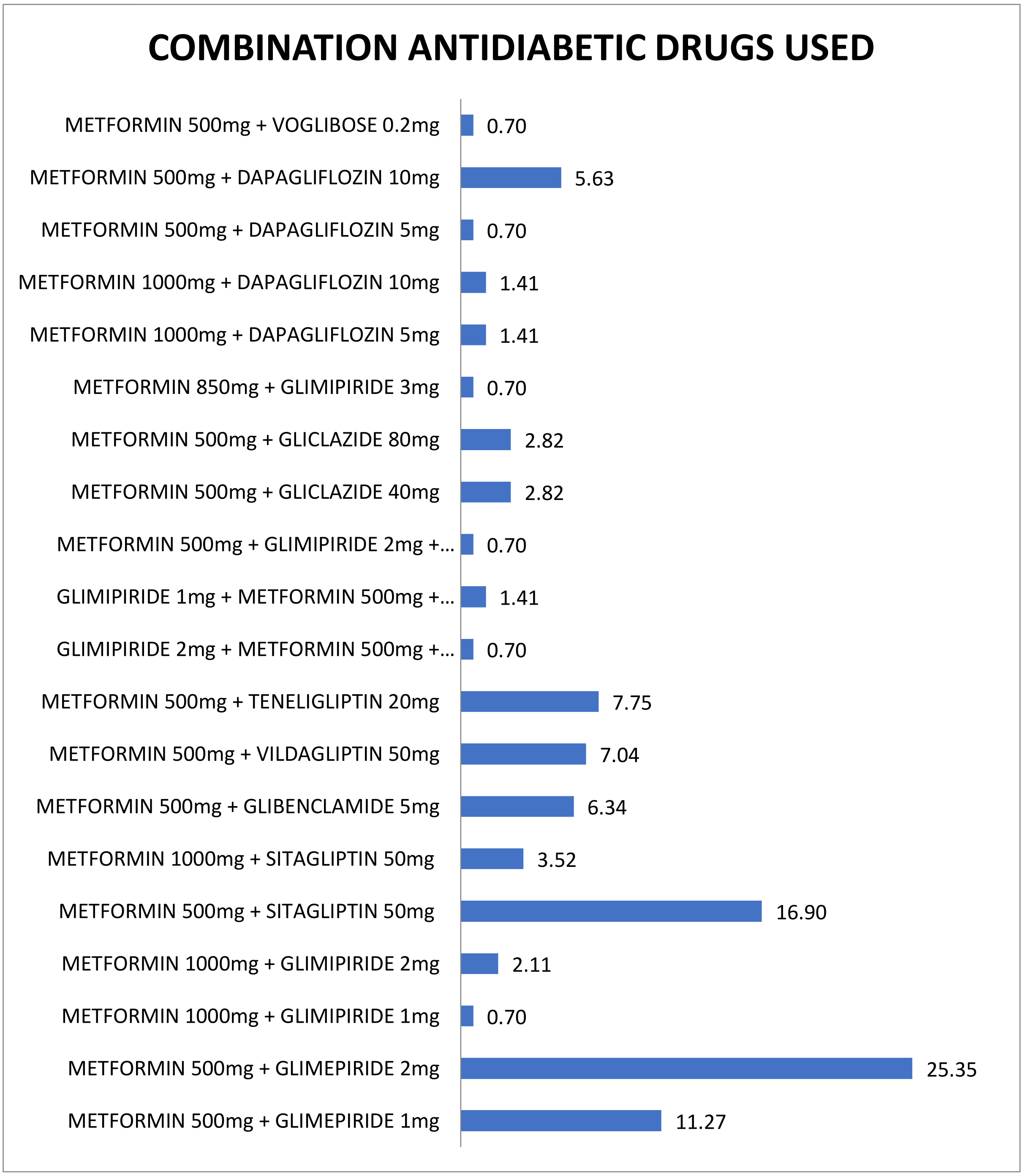

Figure 5: Percentage Distribution of Combination Antidiabetic Drugs Prescribed.

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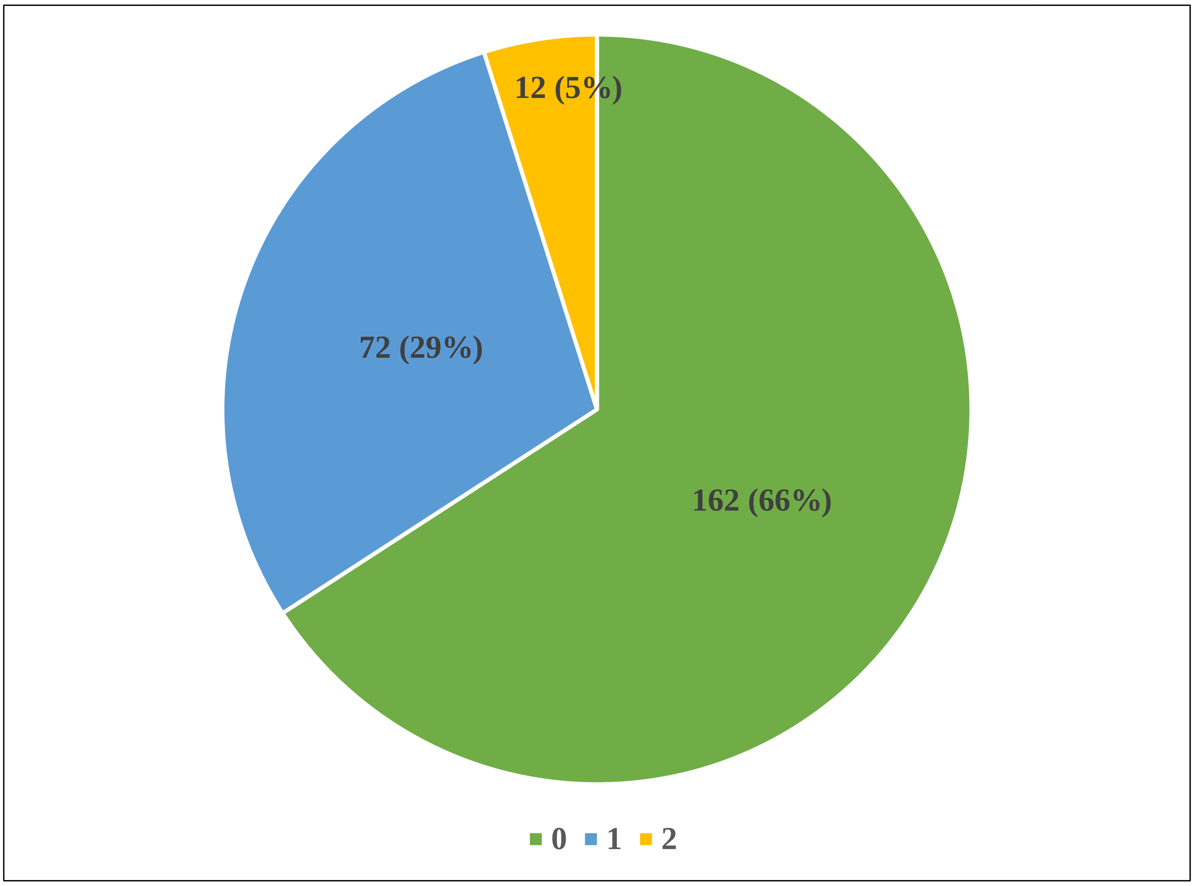

Figure 6: Distribution Based on Number of Insulin Preparations Prescribed.

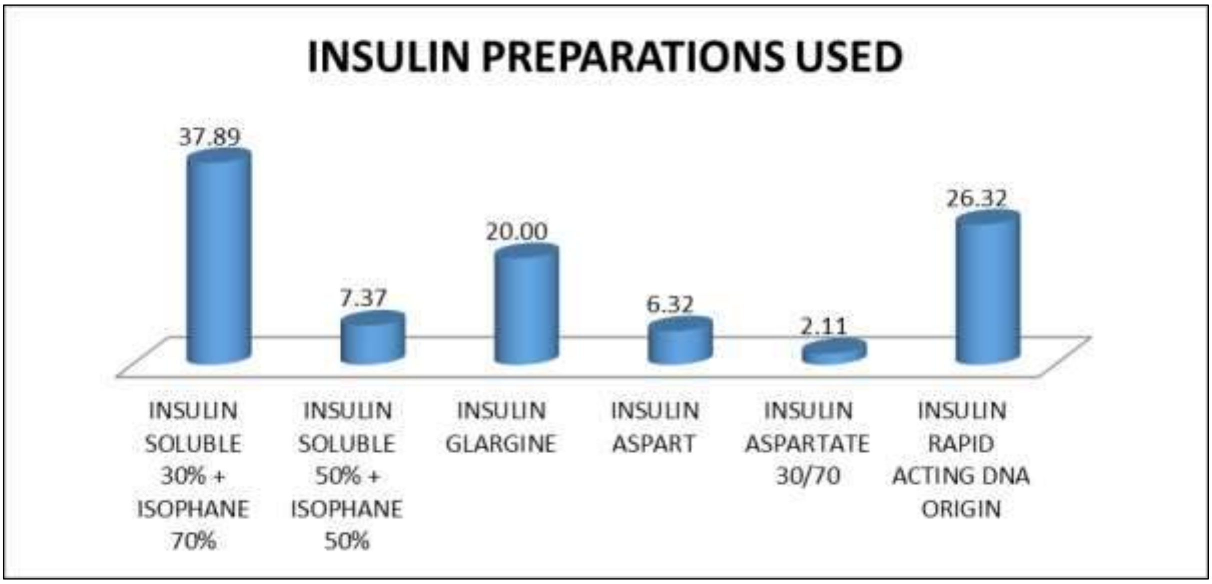

Figure 7: Percentage Distribution of Insulin Preparations Prescribed.

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SEEN, BUT IGNORED: A CRITICAL REVIEW ON MENSTRUAL HYGIENE PRACTICES IN INDIA

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ABSTRACT
Adolescent girls make up 8% of the total world population (estimated to be 0.6 billion) (World Bank, 2023); and improper menstrual hygiene can have long-lasting impacts on their health which may lead to period poverty, and wide-spread economy-wide spill-over effects (Khan, 2023). The continuing efforts of the World Bank to improve menstrual health management (MHM) is evident in the proportion of its ongoing projects involving menstrual health promotion (43 out of 178 projects as of Feb, 2022) (World Bank, 2023). Despite gaining attention in recent years, menstrual hygiene is a less familiar topic among the "355 million menstruating women in India" (World Bank, 2023). In the current article, the author will first, review the current state of menstrual health management in India and present reasons for the same. Second, it sheds light on the several policy efforts undertaken by the Indian government, NGOs, and citizens. Lastly, it presents suggestions on better MHM by referring to successful event studies and pilot projects.
KEYWORDS: *menstrual health management (MHM), Period poverty.*

INTRODUCTION

Menstrual health management (MHM) is a pressing issue in India, with factors such as lack of awareness, inadequate sanitation facilities, social stigma, and environmental concerns contributing to the problem. Indian women's lack of awareness is sustained by a paucity of knowledge on menstruation coupled with negligent approaches in educational institutions (Sharma et al., 2020). The lack of adequate sanitization and disposal facilities makes MHM even more difficult and has a negative impact on the health, education, and empowerment of women (Khan, 2023). Despite governmental efforts, including guidelines, programs, and subsidized biodegradable napkins, there is still a significant gap in effective MHM practices. Addressing this challenge requires identifying successful pilot studies and adapting them to the Indian context, along with exploring innovative approaches. This review article aims to highlight the importance of integrated strategies to promote MHM and advocate for improved menstrual health for women in India.

METHODOLOGY

This is a review paper which draws on the work of the existing field of research in this topic. Electronic literature databases were searched to identify studies that examined the current literature on menstrual health management in India, governmental policies and projects for the same (at national and international level). This systematic literature review is guided by the Cochrane method, and the search method and findings are presented in accordance with the relevant sections of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Higgins and Green, 2011, Moher et al., 2009). Studies were included in the systematic literature review based on the following inclusion criteria: they must (a) quantitatively examine and report the menstrual health management status in India, associated issues, policies and future direction; (b) use a multidimensional conceptualization of menstrual health management; (c) be published in an academic journal and public sector reports; and (d) be available in English.

HISTORY OF MHM IN INDIA

A comparative analysis of the NFHS (National Family Health Survey) 4 and NFHS 5 survey draws attention to the improvement in menstrual practices in India. All the states being studied showed a marked improvement in sanitary item usage, coming mainly from the rural states. With initiatives like the "Bihar's bicycle program", the use of sanitary products more than doubled in Bihar. There was a marked improvement in the infrastructural landscape of sanitation over the last decade (Sharma et al., 2020). The percentage of total population using basic sanitary services increased from 42% in 2010 to 71% in 2020, and that for the rural population increased from 33% to 67% during the same period (World Bank, 2023). The percentage of rural population using safely managed sanitation services dramatically rose from 23% in 2010 to 50% in 2020 (World Bank, 2023). Even though we are miles away from where we want to be, the health and sanitation landscape in India has changed dramatically over the past decade stemming from

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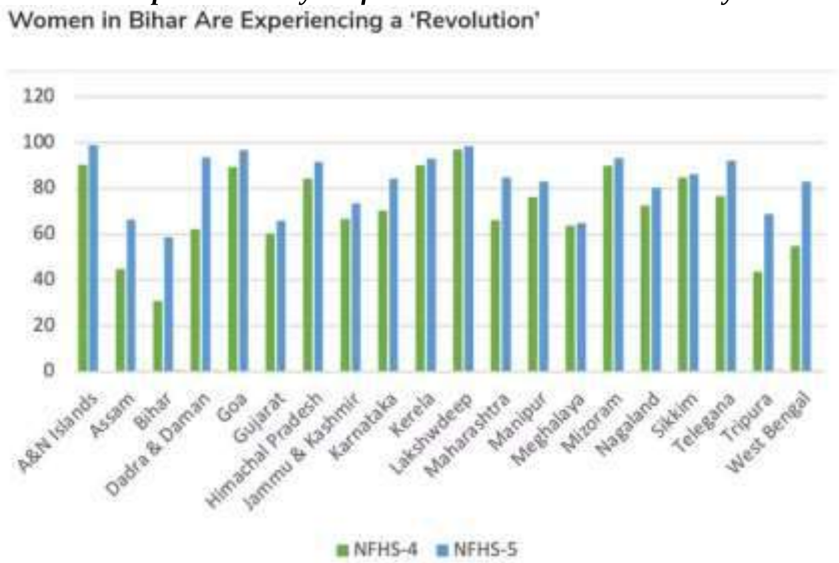
economic improvements, and relentless efforts of the government and society. The increase in awareness, coupled with better accessibility to safe sanitation services has led to large-scale improvements in menstrual hygiene practices (Sharma et al., 2020). The effects of such policies on the quality of female life could be instrumented using the human capital index, which is a holistic measure for the level of well-being of a community or individual. The human capital index for women increased from 0.46 in 2017 to 0.5 in 2020 (World Bank Group, 2023).

Figure 1
Comparative Analysis of the NFHS 4 and NFHS 5 survey



Note. The above image depicts the comparative analysis of the NFHS 4 and NFHS 5 survey with regards to the usage of menstrual products in India (Babbar, 2021). The x-axis represents the different states being surveyed and the y-axis represents the percentage of women using hygienic methods for menstrual management.

In the next section, we shed light on the efforts of the central government, the state government, NGOs, and individuals in combating period poverty.

MHM PROJECTS AT NATIONAL LEVEL

Projects in Maharashtra

Since 2009, the Maharashtra government has launched several initiatives to improve menstrual hygiene practices in the state (Kabir et al, 2020). Maharashtra could be viewed as the forerunner of menstrual health awareness in India, and the lessons from its various policy implementations could help establish effective guidelines for other states. In 2016, the Maharashtra government launched state-specific guidelines on menstrual health management within the framework of the national guidelines (Kabir et al, 2020). It also prepared a roadmap on ways to integrate menstrual health management with the ongoing programmes (Kabir et al, 2020). Maharashtra has also been the pioneer in the launch of innovative strategies, such as the Asmita Yojana. This program aims at providing menstrual products at subsidized rates to adolescent girls (5RS for a pack of 8) and rural women (INR 24/-) through issuing a "smart card" (Kabir et al, 2020). In its first year, more than 276554 smart cards were issued and napkins worth INR 3.6 million were provided at subsidized rates (Kabir et al, 2020). It also made menstrual health education compulsory and compelled institutions to adhere to the UNICEF guidelines (Kabir et al, 2020). Such practices were further enforced through unannounced government visits to schools (Kabir et al, 2020). The State Water and Sanitation Department invested over INR 200 million to improve the sanitation infrastructure in 27,668 schools (Kabir et al, 2020). In order to ensure social inclusion, the state government partnered up with UNICEF to provide the required WASH facilities in inaccessible regions (Kabir et al, 2020). Additionally, the tribal development department invested INR 40 million to better facilitate inclusive MHM in schools (Kabir et al, 2020). The program resulted in an increased attention on such topics and led to the involvement of several ministries. Through the "Meena Ranj Manch", the government reached over 40000 youth clubs and mobilised over 9000 stakeholders (Kabir et al, 2020).

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Figure 2
Timeline for MHM Accomplishments in Maharashtra

Note. The above timeline sheds light on the various efforts and accomplishments of Maharashtra in improving MHM (Kabir et al., 2020).

The implementation of MHM in Maharashtra helped get a clearer picture of the factors leading to unhygienic menstrual practices. Inaccessibility was identified to be one of the key factors, acting in conjunction with the lack of awareness and prevalent social stigma to accelerate period poverty (Kabir et al, 2020). It was further revealed that continuous interventions were more effective than one-time interventions (Kabir et al, 2020). Additionally, establishment of working groups within the government were identified as the key to secure greater participation from development partners and civil society organisations (Kabir et al, 2020).

Projects in Gujarat

An intervention was carried out in Gujarat for one year in 2018 in order to promote hygienic menstrual practices among the tribal women in Gujarat (Vayeda et al., 2021). 892 government frontline workers were trained to spread awareness in 202 villages in Gujarat. "MHM corners" and "MHM committees" were set up in schools to improve awareness and accessibility to hygienic menstrual practices (Vayeda et al., 2021). The intervention led to reduction in absenteeism from 24% at baseline to 14% at headline (Vayeda et al., 2021). The percentage of students utilizing safe disposal practices increased from 69% at baseline to 90.5% at headline (Vayeda et al., 2021). The intervention also helped improve the knowledge of adolescents regarding hormonal changes (7.5% at baseline v/s 73% at headline) (Vayeda et al., 2021). The results of the intervention study were very encouraging, and thus re-enforcing the multi-pronged approach required for better efficacy.

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Figure 3

Study design and Impact areas for the Intervention Study in Gujarat

Intervention	Output	Short term Outcome	Medium term Outcome	Impact
Training of frontline workers	Number of frontline workers trained	Number of sessions conducted by frontline workers	Number of adolescent girls aware about MHM	Empowered adolescent girls
Preparing job aids	Providing job aids	Job aids utilized	Hesitation of the subject reduced	Mainstreaming of MHM as a subject
Establishing MHM corner MHM Committee	Number of MHM corners established	Number of adolescents who visited and utilised MHM material from corner like absorbents, pain killer tablets	Number of adolescent girls remaining present in school during menstruation	
Facilitation & monitoring through supervisors	Number of supervisory visits in a period	Sessions conducted by frontline workers	Awareness and MHM facilities increased	

Note. The above flowchart depicts the study design for the intervention study carried out in Gujarat along with its impact (Vayeda et al., 2021).

Other Successful MHM Projects

In 2012, operational guidelines were issued for the promotion of menstrual hygiene in schools (Sharma et al., 2020). In 2014, the Ministry of Health and Family programme launched the Rashtriya Bal Swasthya Karikram (RBSK) which aimed at bettering MHM practices using a peer education model (Ministry of Health & Family Welfare-Government of India Report, 2020). In 2014, the Urban Management Centre introduced the WASH assessment tool as part of a 3-year project (Sharma et al., 2020). This introduced innovative approaches, such as mobile app-based data collection for sanitation surveys and Swacch Survekshan. It also introduced the concept of a 'model school' which was fine-tuned to the state of the Indian economy (Sharma et al., 2020). In 2015, the National Rural Health mission laid down MHM guidelines which included suggestive measures for improving menstrual hygiene, and established 6 indicators to gauge the performance of MHM (Sharma et al., 2020). In 2018, the government also launched biodegradable napkins for 1rs under the "Pradhan Mantri Bhartiya Janaushadi Pariyojana" (Sharma et al., 2020). Project Jagriti by MAMTA health institute launched a 10-step guideline towards promoting MHM (Sharma et al., 2019).

Project by NGOS and other Societal Efforts

Several efforts have been undertaken by NGOs to break the social stigma around menstruation, and to promote effective MHM in India. The Citizens Association for Child Rights attracted funding for its CSR initiative on improving MHM by top companies like UNICEF, ONGC, TATA Trust, and Viacom 18 (Asan India, 2022). This initiative aims at providing basic knowledge about menstruation and hygiene practices to adolescent girls in the Municipal Corporation of Greater Mumbai. The Myna-Mahila foundation is the pioneer in India for ensuring better menstrual hygiene practices through an integrated approach. It has developed the Myna app to improve menstrual education via health relative videos, inclusion of a period tracker, and the option of scheduling one-on-one consultations with experts (Myna Mahila Foundation, 2022). It also provides doorstep access of menstrual pads to girls across slums in India (Myna Mahila Foundation, 2022). Its key achievements include the provision of more than 12,00,000 sanitary pads, by empowering more than 5,50,000 women (Myna Mahila Foundation, 2022). It aims at bettering its reach by providing menstrual health services to more than 2 million women by 2025 (Myna Mahila Foundation, 2022).

The Centre for Community Health Research adopts an integrated approach by partnering up with Panchayats, state and central governments, schools and PTAs (parent teacher associations), other NGOs, and local community groups. It has targeted the states of Tamil Nadu, Kerala, and Karnataka for increasing the awareness and accessibility to better menstrual hygiene practices and improving sanitation through scientific solid and liquid waste management (Asan India, 2022).

Further, the worldwide release and critical acclamation of the Indian film "Padman" helped a great deal in breaking the social stigma around menstruation. The introductory advertisement at the beginning of all films could be viewed as another effort by the Bollywood industry to promote menstrual awareness. In the entrepreneurial community, "padcare labs" could be seen as the flag-bearer of innovation for bettering menstrual practices. The company has introduced a patented solution which aims at reducing the non-biodegradable waste generated from usage of non-eco-friendly pads.

Global Successful Pilot Studies

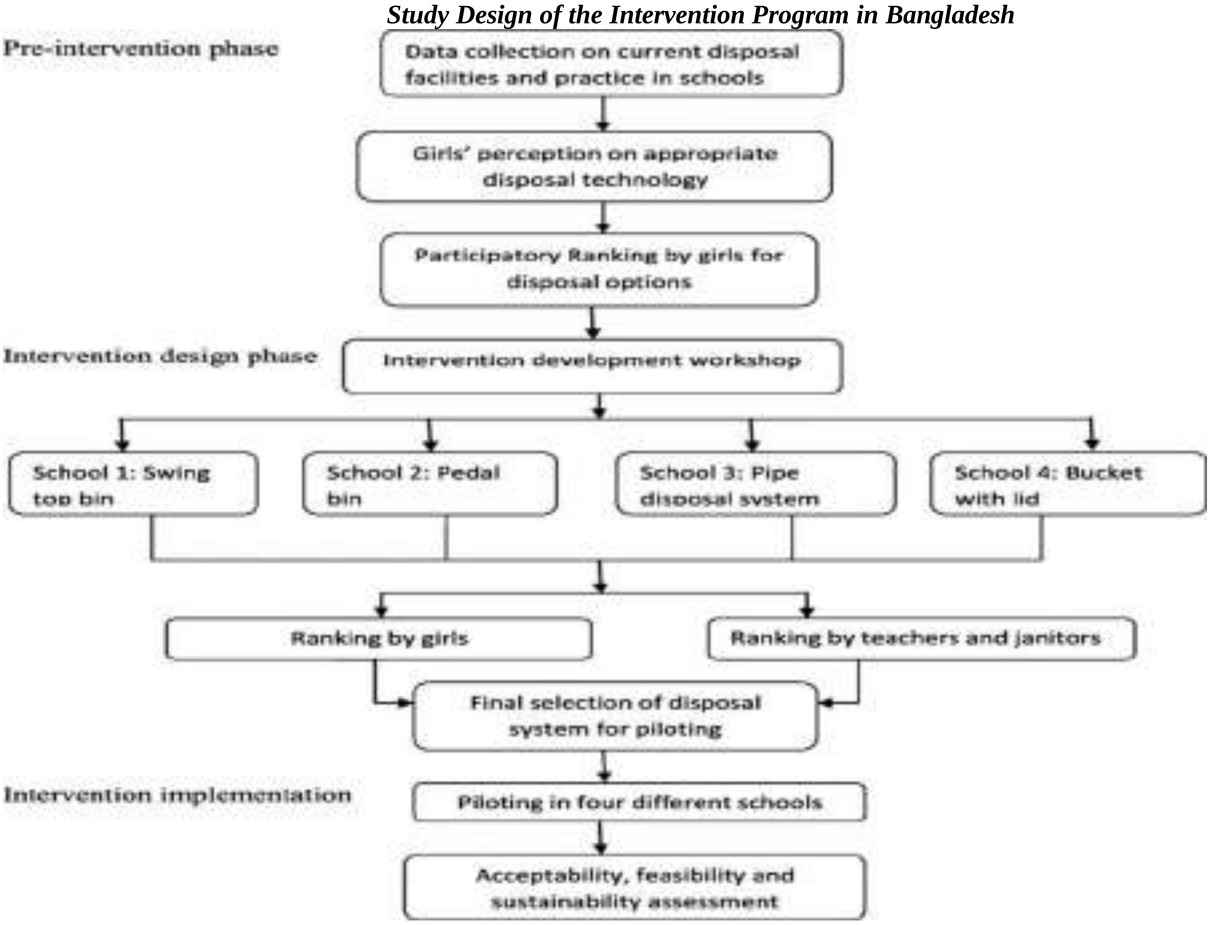
In the next section, we draw our attention to interventions and pilot studies which revolutionized the way of dealing with menstrual hygiene.

Intervention Study in Bangladesh

The pilot study conducted a 6-month intervention program in Bangladesh carried out in 2 rural and 2 urban schools (Jahan et al., 2020). The intervention included a three-pronged strategy, which aimed at improving education, accessibility, and maintenance. Students were provided MHM packs, which included all the necessary items required during menstruation. Sexual education was made part of the course curriculum, and facilities were in place for hygienic disposal of menstruation pads (Jahan et al., 2020). Figure 1 represents the study design.

Figure 4

Study Design of the Intervention Program in Bangladesh



Note. The following image has been used from Jahan et al. (2020) to explain the intervention.

The follow-up mechanism ensures strict adherence to the objectives, as 100% of students reported receiving puberty education, 92% of which received booklets; 85% of students reported to have received the MHM packs (Jahan et al., 2020). Following were the key results of this intervention as reported by Jahan et al. (2020): (1) The program led to more frequent changing of menstrual pads by adolescent girls, increasing the average from 3.4 times/day to 4.2 times/day; (2) Increased use of recommended disposal leading to a 8% change between baseline and headline; (3) Fewer incidents and lower case of absenteeism (28% at baseline v/s 20% at headline); (4) 64% of girls disagreed or strongly disagreed to feeling anxious due to menstruation at headline, compared to 33% at baseline; (5) 65% of girls disagreed to being distracted while menstruating at headline, compared to 45% at baseline.

The above results call for an integrated approach as used in the intervention study. The integrated approach could be better carried out by unifying and centralizing the efforts of various NGOs, government ministries, and educational institutions.

Intervention Studies under the World Bank

The Rural Water and Sanitation program was launched in Bangladesh to remove the credit market failures limiting the construction and maintenance of sanitation facilities (World Bank Group, 2023). The program provided microfinance loans to facilitate investment in household WASH facilities and infrastructure (World Bank Group, 2023). The program aims at meeting the financial requirements of 150 women entrepreneurs to help them market and sell menstrual hygiene products through doorstep sale and delivery (World Bank Group, 2023). The program also aims at constructing better facilities in public places to promote hygienic practices (World Bank Group, 2023). In the 1 year of its rollout, the program has empowered over 167281 women with access to better sanitation facilities. By 2025, the program aims at including over 600,000 women entrepreneurs to help overcome the distributional challenges and societal stigma (World Bank Group, 2023). The World Bank launched the Scaling-up Water Supply, Sanitation and Hygiene product in Lao in FY 2019. The program aims at creating a national platform for different stakeholders to engage in improving menstrual health practices through its “nutritional convergence” approach (World Bank Group, 2023). It aims at fostering behaviour change at a community and household level through intervention programs aimed at educating the different demographics and communities. It also strives to better the infrastructural framework in line with good menstrual hygiene practices (World Bank Group, 2023). The World Bank has launched several other projects in the developed and developing economies such as the GAMA in Ghana, Urban Sanitation Project in Mozambique, and the Water Supply and Sanitation Access program in Eswatini (World Bank Group, 2023).

All these programs retain certain common characteristics which could serve as important blue-prints to effective programs. Firstly, the efforts of the World Bank reiterate the importance of a multi-pronged strategy targeted at all sections of the society. Educational interventions should target both men and women, and must be accompanied by appropriate infrastructure. Secondly, the project in Bangladesh provides a new rationale for developmental efforts. It underlies the existing demand-side and supply-side market failures leading to underproduction of environmentally friendly menstrual products and outlines ways to combat the same. The intervention reveals the interconnectedness of social evils like underemployment of women, lack of awareness regarding menstrual hygiene practices, and the underproduction of biodegradable menstrual products. An integrated approach could be employed to tackle all of these by employing more women in household sales of pads which would also help raise awareness at a household level. At a community level, finance constraints could be reduced through micro-finance loans aimed at entrepreneurs specialising in biodegradable products. Lastly, the nutritional convergence approach stresses on the need to harmonize the societal, communal, governmental, and international efforts through the creation of a centralized platform.

INNOVATIVE APPROACHES TO MHM

OKY Period Tracker

In 2018, the UNICEF engaged in extensive market research by interviewing adolescents, their parents and teachers in Mongolia and Indonesia in order to create the prototype for its period tracker app (Franchi, 2020). Once the prototype design was finalized in 2019, it was subject to multiple revisions based on in-person and remote testing in urban and rural areas (Franchi, 2020) The in-depth research and subsequent revisions led to the development of a “women-friendly” app which stood out in many aspects. The app was applicable to a range of devices, and its content was accessible offline as well (Franchi, 2020). Apart from educational content, the app included several features, like multiple user logins and password protection for better privacy; and period tracker and prediction for diminishing the health hazards (Franchi, 2020). The content was age and culturally appropriate, and helped disseminate such knowledge in a fun and positive manner (Franchi, 2020). The game like design, coupled with menstrual health quizzes and personalized avatars helped women view such topics in a new light (Franchi, 2020). The promotional efforts of the UNICEF began in May, 2020 and thus the app has not yet tapped into many emerging economies. It highlights the key requirements which such applications must fulfil and thus establishes meaningful guidelines for the development of such applications which could be fine-tuned to the Indian economy.

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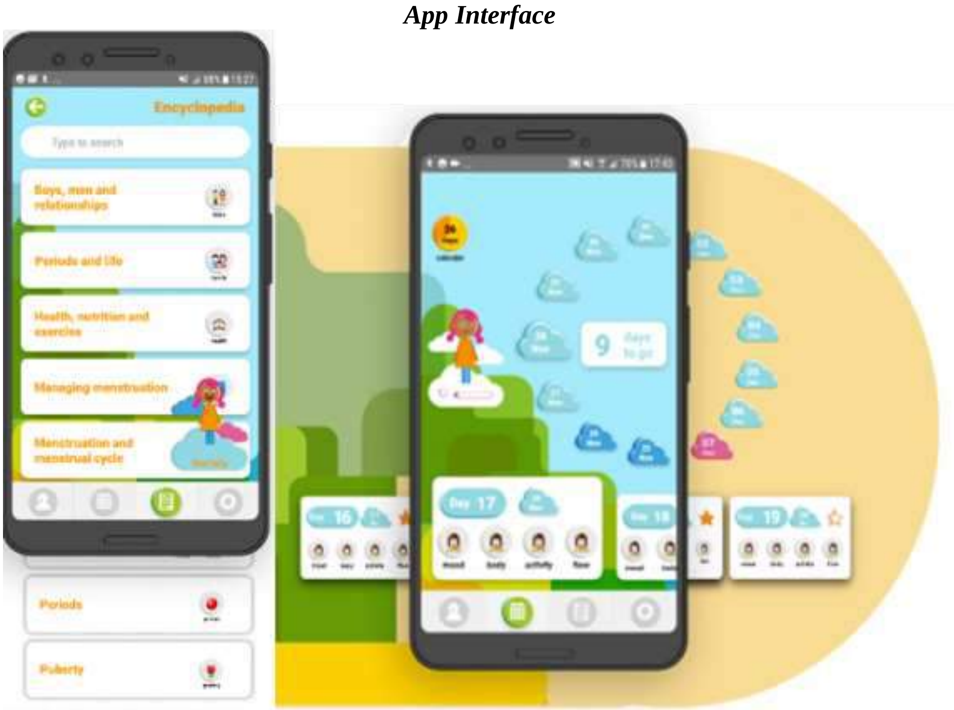
Figure 5
App Interface



Note. The above image represents the user-friendly design of the app which helps draw girls and women from around the world into being better aware about their hygiene (Tyers, 2020).

Innovative Finance

The market for female hygiene products was estimated to reach $ 42.7 billion by 2022 (Franchi, 2020). In order to better tap this neglected market, the Criterion institute partnered up with Pacific RISE to investigate the barriers to trade and deploy effective strategies in overcoming them (Franchi, 2020). As per Franchi (2020), the extensive market research carried out helped identify the following barriers to trade: (1) Weak supply chains leading to distributional challenges and high COGS; (2) Lack of customer willingness to pay; (3) Credit market failures arising from gender biases; (4) High degree of risk involved in such emerging markets.

The program identified trade finance as the key solution to all the problems mentioned above (Franchi, 2020). The inclusion of a third-party helps reduces the “payment risk” and “supply risk” mentioned above (Franchi, 2020). Additionally, investing in an ecosystem helps raise awareness, thereby making the market more appealing to investors (Franchi, 2020). Two finance intermediaries were set up to analyse the demand and secure investors (Franchi, 2020). Additionally, a board of experts were set up to fulfil the advisory requirements. The program reached its first milestone by attracting an investment of $ 49,300 from 15 investors spread across USA, Australia, and Sweden (Franchi, 2020). The success of this initiative makes it a viable blue-print which could be deployed by the Indian government to centralize the production of menstrual products, and help combat the supply-side issues.

Opportunities to Implement Effective MHM in India

Even though the results on a school-level are promising in the form of reduced female absenteeism, dropouts, and child-marriage (CK, 2022); a targeted approach towards middle-aged and elder women (>25 years of age) is the need of the hour. Firstly, laws concerning gender equality at the work-place are either not enforced ineffectively or present only in certain states. According to a survey, 37.3% of women reported to have missed work during periods, and 60% of women had sanitation facilities located at a distance from the workplace (CK, 2022). This could partly explain the remarkable low participation rate of women in the workforce (CK, 2022). Only 23% of female participated in the workforce even though women account for nearly half of the population (World Bank, 2023). Thus, the societal stigma regarding menstruation and the role of women in general is yet to be changed at a national level.

Even though the practices and policies in place go a long way in improving menstrual awareness, one may make a case for the in efficient coordination of such activities. The activities of the different departments of the government, international agencies, NGOs, and companies could be better coordinated to reach a greater impact with the same resource spend. The inclusion of the private sector in such practices, through CSR initiatives is imperative to implement such policies at a large scale.

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The market for menstrual products in India is infected with several demand-side and supply-side market failures. On the one hand, the difference between the actual benefit and perceived benefit of such products necessitates some form of government intervention, which has traditionally been subsidies. On the other hand, asymmetric information leads to production of low-quality pads. Moreover, the use of non-biodegradable sanitary pads poses serious environmental issues. This has necessitated the shift from awareness on the use of menstrual products, to awareness on its actual benefits, environmental effects and quality. Extensive marketing campaigns are being carried out by players like P&G and Johnson & Johnson to eradicate the asymmetric information characterizing the menstrual hygiene market in India. The government should leverage the efforts of the private sector to combat such market failures.

Figure 6

Spotlight Red Campaign by Procter & Gamble (P&G) and UNESCO India

Note. The "Spotlight Red" campaign launched in Mumbai by P&G, in association with UNICEF, is displayed in the above picture.

POLICY RECOMMENDATIONS

First, better utilization of resources. The efforts of several international agencies (like UNICEF and World Bank), multinational companies (like P&G and Johnson & Johnson), and NGOs could be harmonized to ensure demographic and communal inclusion at a national level. The Myna app could be revised in line with the OKY period tracker, fine-tuned to the Indian economy, and be rolled out on a national basis. Start-ups, like 'padcare labs' should receive extensive government support to ramp-up their production and operations. Just as done in Maharashtra, the government should devise ways on integrating MHM into the existing operations at a state and national level. Successful pilot studies by the World Bank could be replicated and fine-tuned to the existing economy.

Second, approaches based on multiplicity. Provision of subsidies and other such government interventions in the absence of market failures leads to welfare loss. Even in the presence of market failures, the welfare gain from policies is relatively smaller compared to their cost. Multiplicity refers to the big welfare effects of comparatively low costing policies. Such welfare gains could be achieved through nudges and mainly exist in the presence of behavioural biases. The market failures characterizing the menstrual products market in India (asymmetric information regarding the quality of menstrual products and difference between the actual and perceived benefit) make such multiplicity approaches relevant. The presence of gender inequality, social stigma, and other such biases further provide the government with opportunities to achieve dramatic welfare gains. Consumers should be made better aware of how to check for quality certifications. The rise in consumer consciousness would itself incentivize the private sector to adhere to these standards.

The theory of related markets should be applied carefully to the existing menstrual hygiene market to more effectively combat the market failures. The low participation rate of women (23%) (World Bank, 2023) could be improved through policies aimed at providing micro-finance facilities and subsidies to women entrepreneurs to facilitate the production and distribution of menstrual products. The limited reach of large companies like P&G and Johnson & Johnson in rural areas leads to unawareness and inaccessibility to hygienic menstrual products in such areas. This, coupled with low participation rate of women in such areas (30.03%) (Biswas & Banu, 2022), makes such policies even more applicable. Women could be equipped with the required finance and skills in producing hand-made eco-friendly products. Door-to-door distribution of menstrual product by women would serve as a supplementary source of income, along with improving awareness. Such policies would help in lowering the societal stigma, meeting the supply-side issues, and may foster demand-led industrialisation.

Subsidy provision should be limited to only those communities where the private sector and social sector underperforms. The essence of the above argument is that if a household can afford a menstrual product, but is not purchasing owing to the divergence between the actual benefit and perceived benefit; governmental efforts should be directed at improving the mind-set rather than providing the subsidy. Even in scenarios where the households cannot afford menstrual products, consumption subsidies should be replaced with production subsides to have a greater impact through job creation, better awareness, and improvement in living standards.

Third, lowering the societal stigma. Labour laws and their implementation should be better enforced to promote gender equality. With the increase in consumer consciousness, companies have turned their attention to maintaining a good public image. Companies like Zomato and Swiggy offer period leaves to their female employees in order to promote employee welfare and better their brand perception. Whereas Zomato employees are entitled to 10 PLE's (period leaves every year), female employees in Swiggy can claim 2 leaves every month. This aspect of private sector behaviour, coupled with the primary role of women in household consumption could be better exploited by increasing the transparency regarding work conditions and gender equality. A nationalised database could be launched to collect surveys on the work conditions, and accordingly reports could be published. This practice would ensure automatic implementation of labour laws, and lead to better work conditions for women. Efforts should be taken on creating a "ripple effect" in the economy with the children at its heart. Family events on menstrual hygiene could be organized in schools to ensure upward flow of knowledge from students to parents. The role of the youth in lowering the societal stigma needs to be understood, and appropriate strategies need to be devised to ensure social and demographic inclusion.

All the steps required to ensure effective MHM complement each other, in the sense that awareness about menstrual hygiene can ensure effective MHM only if facilities and infrastructure are in place, and there is lack of social stigma relating to the topic. This understanding stresses on the importance of an integrated approach to menstrual hygiene, whose success is empirically confirmed by the event studies in Bangladesh and Gujarat. Moreover, the efforts of different groups need to be harmonized in order to achieve a greater impact. This can be seen in the efforts of the Centre for Community Health Research which has partnered up with various government bodies to ensure a greater impact. Such programs should be rolled out nation-wide in order to abolish period poverty and taboos in India.

CONCLUSION

The menstrual revolution in India is in different stages in different regions. Successful pilot studies in states like Maharashtra, where menstrual hygiene and related concepts were introduced more than a decade before, could serve as viable blueprints for other states. Such states could act as centres of innovation in further reducing the societal stigma around menstruation through targeting corporates, the use of technology, and multiplicity approaches. Innovative strategies launched by the UNICEF and World Bank could be carefully applied to such states, which would serve as pilot studies for other states. The challenges faced in implementing MHM in India and other countries should be carefully considered to avoid ineffective planning and execution. Multiplicity approaches based on behavioural biases and related markets should be adopted to maximize welfare gains using the scarce resources. Coordination and integration between different sectors of the government and society is imperative to avoid duplication of work and wastage of resources. The government should leverage the ideologies and efforts of agencies like UNICEF and the World Bank to eradicate period poverty at a national level. The private sector must be increasingly involved for increasing awareness around such issues. The role of the youth needs to be recognized and better leveraged through appropriate policies.

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THOUGHT ON THE ROUTINES: TREMORS OF THE NORMALITY

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Humanity is in love with art and performance beyond ordinary perception. At the core of each human heart, there is an aesthetic sensibility, which is common to everyone, including the case of deeper emotions and desires. The most common and basic emotion is that of sex which comes with a synthetic structure and working of the human mind. While it is considered common to all living beings, there are certain differences between the animal kingdom and rational humanity. As sex makes way for the sustainability of each animal to carry on its existence with another generation, sex comes with a package of pleasure, together with the responsibility of participating in reproduction and being a part of nature. But when it comes to the sex life of humanity, certain signs are found in society. The talk on sex brings blushing on the cheeks of youngsters and on the other hand social censorship among the commoners. The reasons for these kinds of gestures are to be studied and evaluated to understand social conditioning and their impact on society and the human psyche.

The idea of censorship became popular by the influence of tyrants and monarchs of the past. It became much more popular during the reign of Oliver Cromwell in the 17th century. During this period, when Cromwell took over the government of England in 1642, his government enforced censorship for the art and performances that were publicly presented and made sure that the Puritan order of things was followed. Here the idea of censorship is not simple or logical, but rather, it is a theatrical concept for banishing something that already persisted in society in favour of the present government. It can be perceived as the idea of the government and attempts to manipulate the people based on some particular ideology using morality. And the same ideology is being forced upon society as an attempt to project one's domination in society. And in our day-to-day lives, we make use of these same theatricals and performances. Sometimes, people renounce themselves and others as bad performers and criticise others based on common sense, which is a series of ideas on everything that is drafted by society. Ultimately people recognize that every act is made from one's personal feelings and emotions. And one shall become the prophet of one's thoughts.

Foucault agrees with the thoughts proposed by Frederic Nietzsche. According to the proposition of Nietzsche, the course of ideas can find a certain shift in the understanding of everything one has known, especially the morality and principles that are in practice. Here reality strikes that the so-called 'morality' was formed in such a way that supports the well-being of the society. His proposal of the idea of sheep and wolves theory in which he states that humanity can be divided into the ones who may become prey and the predator, clearly states the working of the society. There are two kinds of people: those who belong to the predator category and those who belong to the sheep category. The predator kind of people are the ones with the potential to make decisions of their own. They belong to the people with the ability to lead and make wonders in society. But as these people make their stand, they drift apart from society and become aloof. On the other hand, the sheep kind of people are always into the idea of the herd and they find solace in the company. As the proverb goes 'Esprit de corps', these sheep people attain power over the society. Hence the control of the society falls on these weak people and they decide and define the realities and moralities of the society. In the end, there is someone to talk about the sheep and make themselves innocent, while the powerful individuals become the antagonists from the perspective of social drama.

Society works in such a way that it always tries to uphold the weak even if they lack the capabilities as the stronghold of the society. When it comes to the idea of sexuality, society doesn't look for the perfect ones who perceive it as a common phenomenon of human life, as animal life. The weak people perceive sexuality as 'unthinkable' because they are intimidated by powerful people. That utterance of the word 'sex' in different circumstances is treated as vulgar words like 'fuck' to express the anger and rude nature of the individual. By employing these kinds of usages, society successfully oppressed the idea of sexuality. Hence the ideology of the weak became powerful and their ideas became the centre of social practices.

According to Derrida, the ideology of sex is being understood variously. Various professions get the opportunity to redefine the concept again and again as their respective profession demands, yet ultimately they all shift from the core idea of sex to other levels and 'lose the name of action'. The idea of sex is more than a physical phenomenon more than a means of reproduction. Reproduction

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happens as an effect of pleasure-seeking yet nature uses this time to use the synthetic organic body of living organisms to make them reproduce another generation. But when it comes to civilised society, society has penetrated the freedom of nature and established culture over nature. The acclaimed writer Rousseau pointed out that man is born free, but everywhere he is in chains. The society manages to make its own space through various institutions like family and education. And this higher learning hides the reality of sex from human perception. As the powerful emerge from the weak according to Nietzsche, they propagate the ideology of the weak and try to embrace the weak perception as the value system to be followed in the society. Hence the true potential of strong people is suppressed and their calibre to attract sexual partners are oppressed by the name of marriage and the institution of the family.

Why is the idea of sex being remodelled? The answer is pretty much clear. It is being weaponized to control society. The art of theatrics helps society to achieve this goal. When we make a close analysis of the language, the fundamentality of language is based on grammaticality, reliability and acceptance. But it is another theatricality that helps the language to function smoothly as society dictates. This social intervention can be found in all aspects of human life. And every moment of human life is modified by the aesthetic experience which has a kind of theatricality in its core. From the beginning of the day, the society prescribes certain cords to each of the living beings to play and the play of the day is in different spheres. The plot of the theatrics is not based on a single-dimension story but rather it is on various dimensions and each dimension takes a different place when compared to the other one. The result is that each conversation is about each aspect with different characters which will be having interior relation to each other, but may not be visible. This invisible relation constitutes the soul of the characters and when avoiding the same, brings the notion that they are the outcast of the conversation.

The aesthetic sensibility always heightens the idea and emotions. Every common emotions and base feelings are so much enriched by these ideas of aestheticism. As humanity is rational, it should have only focused on the bare needs and pleasure. At this juncture, we find out that they go on to another sphere, where art and aesthetic sensibility acquire a better realm. Everything that centres humanity is controlled by its heightened artistic expressions.

The question concerning the base behind all the expressions of life becomes so important or is it a cover-up to something? An attempt to bring out the true reality before a capable mind to see the working of a mind. The mind is always trying to conquer the throne of a living being. Every fantasy enriched by the mind tries to find its space in the real world too. But somehow those projections acquire a kind of theatricality within its function. When it comes to the idea of sex being considered as strictly personal even those personal spaces give importance to theatrics and its performance. The adult film industry is aware of these ideas and makes use of these ideas that are related to sexuality and its relationship with arts in their production. More than the sexual acts the dialogues and gestures give ecstatic experience to the viewers. And this hyperbolic act gives more pleasure than sexual intercourse. Why does the mind still hang over these aesthetic performances? The theatricality does some magic and it works in the mind of a viewer like a catalyst. The same theatrics is employed in the practice of religion and a learned fellow can enjoy its theatrics. The arts and performance is persisting in the mind of the audience even when they lose the balance of id, ego and superego.

The construct of mind is sophisticated enough as it may not always be following the reasons that surround it. But the working of that synthetic structure is more lively than all those reasons and champions the caliber to accept those rational ideas as to suspend them to have a better world. As pointed out by Coleridge, the 'willing suspension of disbelief' helps us to achieve the capacity to imagine at a better level. All those faculty find its root in the synthetic working of the mind itself. The output of all those processes is various emotions and these are being translated into words by the mind. These emotions are supposed to penetrate the minds of the listeners to awaken the sensibility within the listeners. But it is not easy as it needs to break their common sensibility to expand their emotions: to break the coating of rationality. Aesthetics helps the mind to enhance its caliber to accommodate more emotion and feel reality than itself.

Art and performances are two divergent streams and yet have the same source and soul. Art is an aesthetic presentation of various mind properties while the performance is using theatrics and gestures to convey something. The erotic thirst of the human body may not be successful as it always needs the consent of the mind. But the mind is too much indulged in the aesthetic sensibility and even in erotic moments it is seeking an aesthetic experience. Hence language and gesture also play a significant role at this point.

The erotic moments are nurtured by the romantic spirit. It is the same free spirit of the French Revolution, but the same idea smoothens the erotic experience. The gestures prove and certify certain emotions and feelings of an individual. So ultimately, sex is more about mind play rather than that of the body: it is the mind that is to be satisfied through sex than carnal pleasure. Ultimately sexual intercourse turns out to be the sex of the mind, an aesthetic experience.

The idea of sexuality and its means of performance is not new. Even before modernization, ancient scholars were aware of this kind of phenomenon that functions in society, particularly in the human psyche. A work like Kamasutra is an example of the thought of ancient civilization. Even if it consents to sex, the teaching of sex means extending erotic pleasure by making use of aesthetic sensibilities. And those teachings highlight the need to have a performance that is a mere animistic erotic adventure.

In modern-day, sexual studies are acquiring more importance than in the past, but aesthetics or eroticism is yet to be discussed. Social morality has already suppressed the erotic sensibility as we have already discussed. The people who have shown their interest in the erotic drama are in the profession of prostitution and they are being suppressed by society. Here, the protagonist in this scenario is representing the same old radical notions of morality. In the case of prostitutes, the erotic experiments make them acquire knowledge to be better sexual partners and be successful in satisfying their customers. As for them, each customer is an opportunity to research more in erotic drama and try to extend erotic pleasure through artistic performance. Knowingly or unknowingly they become experts in their profession. To conclude the point, some people recognize the importance of performance in their own time and space. It is a way, a method to communicate what the mind truly desires.

Modernity had promised so much when the aesthetic idea of nudity was included in art and literature. Hence the idea of nudity helps in a way to suspend all the moralities that are dictated by society and for the moment, the audience or reader finds the freedom to embrace the aesthetic idea of sexuality and its pleasure in a refined form. But when making a close analysis, it must make a strong affirmation that the becoming of nudity has more importance that the thought of nudity. As in the case of nudity, its pleasure has come to a halt at the vision itself. Adult films and modern films make use of these ideas and give more importance to these projections to talk about one's sexual tone and how much those images convey the passion and feelings of sexual partners. In conclusion, we can see that even in private moments, where we believe that emotions and physique take control, the mind and its aesthetic principles interrupt and refine to check for the aesthetic elements within them. And the mind seeks more when it comes to everything around. Not only in sexual intercourse but in every aspect of life, the performance takes a lead role in defining everything. Our judgement is based on the performance of everyone and likewise, we are also being judged by society based on the performance. The most significant idea that persists in society is this same performance as that of each action in society.

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USAGE OF ONLINE PUBLIC ACCESS CATALOGUE (OPAC) AS A RESOURCE DISCOVERY TOOL: A STUDY IN LNB LIBRARY, DIBRUGARH UNIVERSITY

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ABSTRACT

The main purpose of OPAC is to deliver users with a user-friendly interface for searching and retrieving library resources. OPACs enable users to conduct searches based on various parameters such as author, title, subject, keyword, and other criteria, making it easy for them to find the materials they need. OPACs also provide users with information on the availability and location of the resources they are searching for, enabling them to request or reserve items if necessary. OPACs are also used to gather statistics and data on library usage and resource utilization. Librarians can use OPAC data to analyze the frequency of resource use and identify trends in user behavior. This information can be used to optimize resource allocation, identify gaps in the collection, and improve library services. To analyze the application and satisfaction level of users in OPAC services, the present user study has been conducted in LNB Library, Dibrugarh University to gather feedback from users on their experience with the OPAC. A structured questionnaire was prepared and distributed among the users (Faculty/Research Scholars/UG/PG Students) of Dibrugarh University. A total nos. of 84 filled in questionnaire has been received which is 56 % of the total population of the study. The study reveals that library orientation/Information literacy programs are helpful for enhancing credibility amongst the users (55.99%) in OPAC search.

KEY WORDS: *User Studies, OPAC, Pathfinder tool, LNB Library, Dibrugarh University.*

1. INTRODUCTION

The application of technology in library management and service delivery has been observed since the 1960s, especially at the forefront of computers. The growth and widespread use of Information and Communication Technology (ICT) in library services gradually created a wider scenario of user engagement that we could not imagine. Among the many key areas of library automation, cataloging is an important part. Cataloging went through a long development phase from a card catalogue to a machine-readable prototype and then to an Online Public Access Catalogue (OPAC). Today, the integration of new technologies in the form of Web 2.0 tools into the standard features of OPAC or Web-based OPAC can evolve with the changing information search behavior of users. An OPAC can be a powerful reflective tool in a learning space such as a library, allowing users to think critically and reflect on themselves as they search for and evaluate resources that support learning. For example, after using an OPAC search, students can reflect on the effectiveness of their search terms and consider alternative search strategies they may use in the future. Access to library resources is essential to ensure that all users have equal access to information regardless of their aptitude. In this context, information literacy must play a key role because it expresses a set of skills and competencies that enable users to effectively identify, find, evaluate and use information. This includes accessing and using various sources of information, as well as critically evaluating the information found and using it ethically. Overall, technology has greatly expanded the scope of library services, making them more accessible and convenient for users while enhancing their ability to provide high-quality services and resources.

2. DIBRUGARH UNIVERSITY LIBRARY

Dibrugarh University Central Library is named after the doyen of Assamese literature, *Sahityarathi* Shri Lakhsminath Bezbarua i.e. Lakhsminath Bezbarua Granthagar. The library started functioning in 1967, just two years after the establishment of Dibrugarh University. The circulation of the library began with an initial collection of 997 books at the tea factory of Rajabheta Tea Estate in the western part of Dibrugarh district.

In 1983, the library was moved to its current location (Appendix 1) with the construction of a new building in the tenure of the then Vice Chancellor of Dibrugarh University, Dr. Sailadhar Gogoi.The current state-of-the-art infrastructure was created after renovation in 2016-17. The library's collections consist of more than 2, 25,000 print and non-print resources and provides online

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access to more than 10,000 e-journals and over 7,000 e-books along with many other collections. The Library has been automated with SOUL 2.0.

Figure 1: an OPAC terminal in ground floor Figure 2: OPAC terminals in each floor

3. REVIEW OF RELATED LITERATURE

Uplaonkar (2020) conducted a case study of OPAC services provided by the Library of Agricultural Sciences University, Dharwad, Karnataka. A structured questionnaire was distributed to 80 nos. of faculty members and found that most of the faculty members (79.66%) of Dharwad University of Agricultural Sciences are well acquainted of the use of OPAC and use it regularly to access library resources.

Kumar et al (2018) in their study on OPAC usability in both Indian and foreign university libraries and found that there is an important relationship between OPAC awareness and OPAC usage. User behavior in academic libraries has changed significantly over the past decade, and most libraries now follow Web enabled OPAC rather than a traditional catalogue.

Kumar (2017) in his study tries to determine the awareness and usage of OPAC among English, Mathematics and Commerce students of Kurukshetra University, Haryana. The study reveals that students' knowledge of OPAC is weak, and most students use the OPAC to search for documents from the shelves using the Title search (33.90%) with the assistance of library staff.

Kumar and Singh (2017) conduct a descriptive survey in the Guru Gobind Singh Inderparstha University Library, Delhi and found that 39.1% of the library users used the OPAC daily. 54.4% of the users were fully satisfied with the existing OPAC facility and some of them faced difficulties such as lack of awareness about the OPAC system, unsuitable location of OPAC terminals and lack of library staff near the OPAC terminals.

Shivakumaraswmay and Narendra (2016) conduct a study on OPAC usage and user satisfaction in BGS Institute of Technology Library, Mandy, and Karnataka. The research shows that the main purpose of using OPAC is to find information of documents on the library shelves (27.69%). Lack of information literacy and lack of proper guidance are the biggest problems of the users who participated in the study.

Kumar and Vohra (2011) conducted a study on OPAC usage in Punjab University Library, Chandigarh. The study deals with various aspects of OPAC such as frequency of use, purpose, ease of use, satisfaction of students and staff of Punjab University Library, Chandigarh. The survey reveals that most users are not satisfied with the OPAC system and need familiarization with it.

The studies reveal that although a significant percentage of faculty members and students are acquainted with using OPAC, there is a lack of awareness and knowledge among users. Further research could explore effective methods for raising user awareness and providing adequate training to enhance their understanding and usage of OPAC systems. The studies mention that users often use OPAC to find documents on library shelves. However, it's important to understand the underlying reasons for this behavior. Exploring user information literacy levels and investigating the factors influencing user behavior in utilizing OPAC for accessing both physical and digital resources could be a valuable area of research. Different studies report varying levels of user satisfaction with OPAC systems. Factors such as lack of awareness about the OPAC, usability issues, and physical placement of OPAC terminals contribute to user challenges.

4. OBJECTIVES OF THE STUDY

- To know the usage of OPAC as a guiding tool to inventory.
- To study the purpose and use of OPAC by the library users.
- To analyses satisfaction level of users in OPAC services.

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5. METHODOLOGY OF THE STUDY

The study is conducted using the descriptive survey method. Considering the objectives of the study the researcher prepared a structured questionnaire as the primary data collection tool and physically went to the library to collect data. The total population of the study was 150, and the researcher selected 84 samples using stratified random sampling, which accounts for 56% of the total population.

6. DISCUSSION

6.1 Category of library OPAC users

Mapping the user of the library's OPAC is one of the ways to understand the primary user category (Table 1). In the context of Table 1, it is evident that the majority of the OPAC users are students 46 (54.76%) followed by research scholars (34.52%).This information can help the library staff to focus on the needs of these two primary user categories and design services and resources that cater to their requirements.

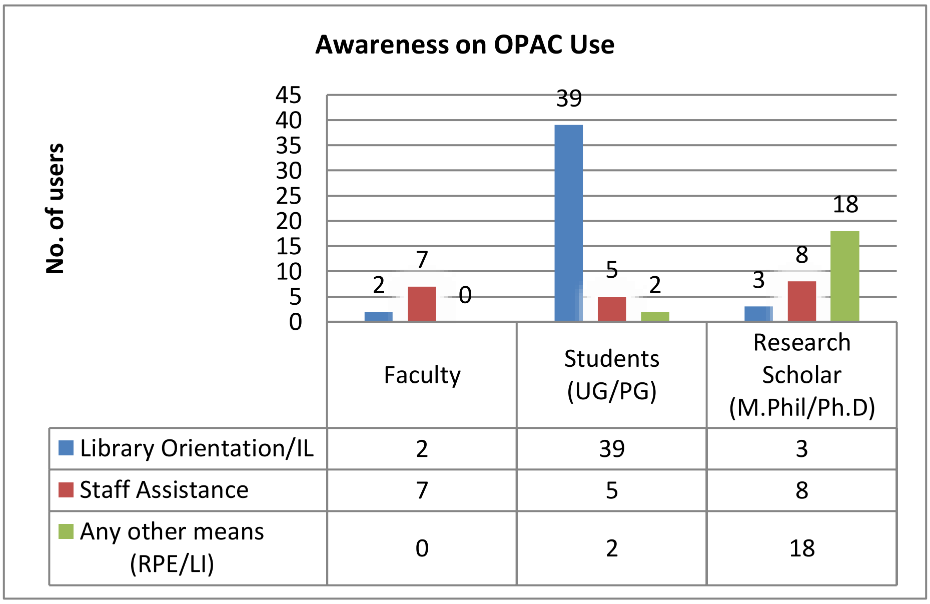
Table 1: Responses received from the category of library OPAC users (N=84)

Sl. No.	Faculty	Students (UG/PG)	Research Scholar
1	09 (10.71%)	46 (54.76%)	29 (34.52%)

6.2 Awareness on OPAC use

It is important to measure the level of awareness on OPAC use in order to recognize the sources of learning factors for OPAC among different categories of users. Figure 3 indicates that for undergraduate and postgraduate students, Library Orientation/Information Literacy (IL) programs are the main source of familiarization with OPAC facilities, with 39 out of 46 students (84.78%) reporting this as their primary source. For research scholars, other means such as Research and Publication Ethics (RPE) classes, library instructions, and other resources were reported as the primary source by 18 out of 29 scholars (62.06%).

Figure 3: Sources of obtaining knowledge on OPAC



6.3 Frequency of OPAC use

It is important for libraries to determine the frequency of use of Online Public Access Catalogue (OPAC) system in order to better understand the usage habits of the users and identify areas for improvement. Table 2 shows that Students (UG/PG) 19 (22.61%) are the largest user group who use OPAC very frequently to search library documents followed by Research Scholar 10 (11.90%). These data indicate that OPAC is particularly important for these user groups and the library should continue to focus on providing quality OPAC services to meet their needs.

Table 2: Frequency of library OPAC use

Frequency of usage	Response		
	Faculty	Students (UG/PG)	Research Scholar
Very frequently	0	19 (22.61%)	10 (11.90%)
Frequently	7 (8.33%)	06 (7.14%)	11 (13.09%)
Occasionally	2 (2.38%)	13 (15.47%)	07 (8.33%)
Rarely	0	08 (9.52%)	01 (1.19%)

6.4 Types of library collections searched in an OPAC search

Table 3 shows use Online Public Access Catalog (OPAC) by library users for searching different types of reading materials. Most of the users, 34(40.47%) of students use OPAC to search for textbooks and reference books that are available on the library shelves. On the other hand, research scholars 21 (25%) seem to be more interested in searching for other types of reading materials such as journals, reports, theses, and dissertations.

Table 3: Types of materials sought for in OPAC search

Type of Collections	Response		
	Faculty	Students (UG/PG)	Research Scholar
Text Books	4(4.76%)	34 (40.47%)	05 (5.95%)
References Books	9 (10.71%)	34 (40.47%)	18 (21.42%)
Any other reading materials (Journals/Reports/Thesis/Disseration etc.)	9 (10.71%)	16 (19.04%)	21 (25%)

(Respondents were allowed to choose multiple options)

6.5 Search options used in OPAC

Table 4: Search options used in OPAC

Search options	Response		
	Faculty	Students (UG/PG)	Research Scholars
Basic search	5(5.95%)	31 (36.90%)	11(13.09%)
Free text search(Title/Author/subject heading)	09 (10.71%)	46 (54.76%)	27 (32.14%)
Boolean Search	0	19(22.61%)	5(5.95%)
Advanced Boolean Search	0	0	0

(Respondents were allowed to choose multiple options)

Table 4 shows that the majority of students, specifically 46 out of 84, use the OPAC free text search option, which allows them to search for materials by title, author, or subject heading. This is followed by researchers, with 27 (32.14%) of them using the same search option. In contrast, the Boolean search option appears to be the least popular choice among students, with only 22.61% of them using it, and even fewer research scholars, with only 5.95% using it.

6.6. Effective retrieval of documents through OPAC

Table 5: Effective retrieval of documents through OPAC

Question: got required information in OPAC as per the input	Response			Total
	Faculty	Students (UG/PG)	Research Scholars	
Yes	09	38	20	67 (79.76%)
No	0	7	4	11(13.09%)
Sometimes	0	0	5	5(5.95%)
Not Always	0	1	0	1(1.19%)

It appears in the Table 5 that success rates of users in obtaining the necessary information through an Online Public Access Catalog (OPAC) search, out of which 67 (79.76 %) of users were able to find the necessary information through their OPAC search terms. 11 (13.09%) of users did not find the desired results with their search terms.

5 (5.95%) of users sometimes found the results they were looking for with their search terms.
1 (1.19%) of users did not always find the required results according to their search terms in the OPAC.

6.7 Importance of Library Orientation Programme /IL programme in OPAC use

Table : 6 Impact of Library orientation /IL programme in OPAC Use

Question: Orientation helps in searching OPAC		**Response**			**Total**
		Faculty	**Students (UG/PG)**	**Research Scholar**	
Options:	Yes	3	39	05	47 (55.95%)
	No	0	05	04	09 (10.71%)
	Neutral	6	02	20	28 (33.33%)

Table 6 shows that the majority of users 47 (55.95%) feel that such a program is important, while 28 users (33.33%) did not express an opinion on the matter and was considered neutral. The results suggest that a significant number of users believe that library orientation and information literacy programs can be beneficial in enhancing their ability to use the OPAC system effectively to find relevant documents in the library.

6.8 User satisfaction on OPAC

Table 7 : User satisfaction on OPAC

Options	**Response**			**Total**
	Faculty	**Students (UG/PG)**	**Research Scholar**	
Yes	09	26	29	64 (76.19%)
No	0	0	0	00
Not prefer to say	0	20	0	20 (23.80%)

(Respondents were allowed to choose one option only)

It appears in the Table 7 that the level of satisfaction of users with the facilities available in the OPAC (Online Public Access Catalog) is that 64 users, representing (76.19%) of the total, were satisfied whereas, 20 users, representing 23.80% of the total, chose not to express their satisfaction level with the OPAC facilities.

7. MAJOR FINDINGS

- It appears that out of the respondents surveyed, 8 out of 46 students (17.39%) and 1 out of 29 research scholars (3.44%) did not use OPAC to search for information in the library. This suggests that there may be a need to increase awareness and promote the use of OPAC among library users to improve their information-seeking behavior. The library management could consider conducting training sessions, workshops, or information literacy programs to educate users about the benefits of using OPAC and how to effectively use it to search for information.
- It is observed that users mostly search for textbooks (40.07%) and reference books (40.07%), although there are more documents in the database, users search for textbooks and reference books more often.
- It appears that users tend to prefer free text search, as it is easier to use and requires less specialized knowledge. The result shows that most users (76.19%) are satisfied with the search results of Online Public Access Catalogue (OPAC), which is a positive finding. However, it is also important that a significant number of users (23.80%) doubt whether they are satisfied with the OPAC, suggesting that there may be areas for improvement.

8.CONCLUSION

It is true that the effectiveness of an OPAC (Online Public Access Catalogue) largely depends on how users understand and use its various features and search techniques. Although OPACs are designed to be user-friendly, users without prior knowledge of OPACs may find it difficult to use them. Therefore, it is important that libraries provide specific guidance and training to enable users to get used to OPACs. Training programs like workshops and orientations can be organized at least two or three times a year to help users understand the actual structure of OPACs and develop their attitudes and behaviors regarding the search facilities available in OPACs. These programs can also help identify and solve various problems that users and staff may encounter, and provide feedback on how OPAC systems can be improved to achieve better results. In conclusion, although OPACs have usable features, users require specific guidance and training to take full advantage of their services.

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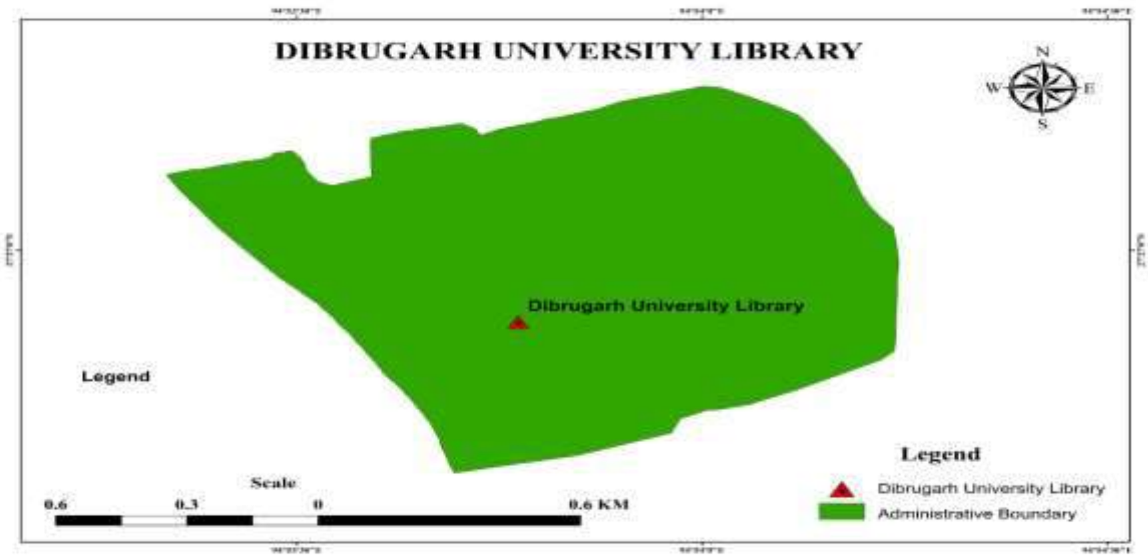
Appendix 1



- **Location of the Library in the University Campus.**

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REFLECTIONS ON US HIGHER EDUCATION IN THE LIGHT OF THE NEW CROWN EPIDEMIC

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ABSTRACT
Amidst global advancements and technological progression, a nation's higher education standard mirrors its cultural influence. The U.S., despite its dominance in higher education, faces challenges, particularly highlighted by the recent pandemic. This paper examines key issues such as financial constraints, rising educational inequalities, and diminishing social responsibility of educational institutions. By focusing on a people-centered approach, fostering educational equity, ensuring quality, and balancing government oversight with market-driven dynamics, the research aims to guide higher education in the post-pandemic world.
KEYWORDS: *Pandemic; U.S. higher education; Challenges; Cultural diplomacy.*

INTRODUCTION

As one of the world's developed countries, the United States has distinctive characteristics of higher education that have brought it advantages in many areas, which in turn have played a vital role in the development of the country's social, economic, scientific and technological, and cultural diplomacy. These characteristics include the diversity of higher education in the US, the openness and autonomy of the school system, and the practicality of the higher education approach, and so on. These characteristics of American higher education have greatly activated the vitality of higher education, enhanced the social service function of higher education, promoted universities to highlight their characteristics by all means, and strengthened the internal construction of universities. These characteristics and advantages of higher education in the United States are worthy of reference for the construction of higher education in other countries around the world. On the flip side, the outbreak of the Newcastle pneumonia epidemic has brought a huge impact on American higher education, and has exposed many shortcomings of American higher education. Despite the fact that the Biden administration has implemented a new policy for American higher education that differs from the anti-intellectualism of the Trump administration, it has still not been able to fundamentally reverse the situation in which American higher education is in deep shock. The review of US higher education in the light of the new epidemic will be of great value in thinking about the future of higher education in other countries around the world.

LITERATURE REVIEW

The COVID-19 pandemic precipitated an unprecedented upheaval in higher education, compelling institutions to adapt rapidly to an unforeseen set of challenges.

Pomerantz and Brooks (2020) provide a foundational understanding of the complexities institutions confronted as they transitioned to remote learning. Their exploration encompasses the experiences of both students and faculty, painting a holistic picture of the emotional, logistical, and pedagogical challenges.

As higher education navigated the murky waters of the pandemic, financial implications took center stage. A report by McKinsey & Company (2020) suggests that institutions, particularly those with pre-existing financial vulnerabilities, grappled with substantial enrollment declines and corresponding revenue losses.

The pandemic didn't just pose logistical challenges; it also spotlighted longstanding inequalities. Grawe (2020) underscores that the brunt of the pandemic's academic disruptions were borne by marginalized students. Barriers ranging from technological access to conducive home learning environments intensified, hampering equitable educational access.

The psychological toll of the pandemic on students emerged as a profound concern. Cao et al. (2020) elucidate this impact, emphasizing the heightened anxiety, depression, and stress levels students faced. Their study highlights the pressing need for institutions to bolster support mechanisms during crises.

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The abrupt shift to online instruction stands out as one of the most defining aspects of higher education's pandemic response. Crawford et al. (2020) provide an extensive review of how institutions across 20 countries, including the US, adapted their pedagogical approaches. Their findings reflect a shared global struggle and an exposed digital divide among students, urging institutions to invest in more resilient and flexible educational infrastructures.

As the dust begins to settle, contemplations on the future landscape of higher education are surfacing. Daniel (2020) offers insights into potential lasting shifts. His predictions encompass the broader adoption of hybrid educational models, a heightened focus on lifelong learning, and initiatives to ensure more equitable access to education.

US higher education's journey through the pandemic, as reflected in scholarly discourse, underscores a complex interplay of challenges and opportunities. While immediate disruptions have been undeniably profound, there is also an emergent sentiment that this crisis might be the catalyst for introspective reforms in higher education.

ANALYSIS AND RESULTS

1.The plight of US higher education in the light of the new crown epidemic

With the great impact of the new crown epidemic, the US higher education system has been thrown into disarray and will face severe tests for a longer period of time. This dilemma is mainly manifested in the crisis facing the finances of higher education institutions, the accentuation of inequity in higher education, and the weakening sence of social responsibility of higher education institutions.

First of all, many higher education institutions have serious funding gaps, and are facing a financial crisis

Funding for higher education in the United States generally comes from three areas: students, donors, and the legislature. Nevertheless, with the new crown epidemic, the sources of funding for higher education have been severely impacted.

The spread of the New Crown epidemic in the United States has undoubtedly had a devastating impact on the country's economic development. The impact has had a domino effect on various sectors. And higher education has inevitably been involved.

The coming of the new crown epidemic has severely affected government public revenues, financial markets, and the labour market at a macro level. At the level of government public revenue, the impact of the epidemic has led to a reduction in economic growth and tax revenue, which in turn has led to a reduction in public revenue. In this case, the government will inevitably cut back on some public services and tighten its spending on higher education funding. In 2020, according to NPR, "The school's financial resources from the government have been reduced by almost half."① At the student loan level, a downturn in the economy can trigger a credit crunch in the financial markets and an increase in loan rates. This makes it more difficult for students to take out loans, which in turn affects their payment of tuition fees and enrolment. At the level of university employment, the economic recession has triggered a lack of consumer investment， and a shrinking demand for labour, with university employment suffering as a result, and this cascading reaction has contributed to a vicious circle in the development of higher education.

At the micro level, the spread of the new crown epidemic will affect household incomes, corporate profits, investment in universities, and then exacerbate the financial crisis of higher education institutions. As unemployment rises, many families' income levels fall, affecting their children's access to education; increased unemployment will also lead to lower levels of consumer purchasing power， lower sales of goods, lower production margins for businesses, loss of profits, financial constraints or even bankruptcy of businesses. As a result, the willingness and ability of donors to give is subsequently diminished.The epidemic continues to spread, and the stock market continues to fall. Many universities have seen their investments shrink. This combination of factors has exacerbated the financial difficulties of higher education institutions. In addition, the epidemic and national policies have led to a Serious loss of international students. As a result, higher education institutions have also lost a significant amount of revenue .According to an April 2020 survey, U.S. higher education could lose nearly $1 billion due to the shortening or elimination of study abroad programs alone.[1]p100

In summary, many higher education institutions in the United States are in great financial crisis as a result of the epidemic, and some have already closed down. According to incomplete statistics, 107 public schools have closed down and 33 colleges and universities have announced their permanent closure in the US, and the number is on the rise.②

①《U.S. education community faces "darkest hour" as epidemic hits》,https://new.qq.com/rain/a/20200816A0HA QZ00,August 16, 2020.
②《U.S. education community faces "darkest hour" as epidemic hits》,https://new.qq.com/rain/a/20200816A0HA QZ00,August 16, 2020.

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Secondly, inequality in higher education has become more pronounced.
While inequity in higher education has long been a problem in the United States, it has been accentuated by the ongoing impact of the new crown epidemic. This is particularly true for African-American, Asian and other minority students.

On the one hand, the epidemic has increased the poverty of many families. Industrial stagnation, unemployment, a sharp drop in income, and being infected by the virus have come and gone, bringing misery to one family after another. According to the US Census Bureau, after five consecutive years of decline, and reaching its lowest level since 1959 in 2019, the US poverty rate rose by 1 percentage point to 11.4 percent in 2020.①At this rate, 37.2 million Americans will be in poverty in 2020, an increase of 3.3 million from 2019. The U.S. Census Bureau also said that in 2020, median household income will fall by 3.2 percent in the Midwest and by 2.3 percent in the South and West. The Northeast (seventy-five thousand two hundred and eleven dollars) and the West (seventy-four thousand nine hundred and fifty-one dollars) have the highest median incomes, followed by the Midwest (sixty-six thousand nine hundred and sixty-eight dollars) and the South (sixty-one thousand two hundred and forty-three dollars). The largest declines in income were seen in households with low levels of education.②Some drop out of school or are unable to attend at all, because their families are too poor to pay for tuition, the internet services and devices ,which are required for online courses. Reduced enrolment is a direct impact of the new crown epidemic on low-income, and minority populations in the US. Students with family incomes under $75,000 are almost twice as likely to cancel classes this fall compared to students with family incomes over $100,000, according to a U.S. Census 2020 data from the end of August.③

On the other hand, the Biden administration attaches great importance to higher education opportunities for low-income groups and minorities, advocating for the reduction of college tuition fees, advocating for loan forgiveness for college students, simplifying the loan and repayment process, advocating for increased funding for institutions in financial crisis, and raising taxes on high-income groups, etc. Through this series of methods to alleviate the inequity of higher education in the United States. However, there is greater doubt as to whether the Biden administration's initiatives will be passed and implemented. Accordingly, it is difficult to solve the problem of inequity in American higher education in a short period of time. The continuation of this phenomenon will cause serious social problems and disturb the stability of society.

Thirdly, the weakened sense of social responsibility of higher education institutions.
The marketisation of higher education in the US has seen a gradual weakening of its public service values. Driven by utilitarianism, some Higher Education Institutions would make the school's self-interest as their highest pursuit, and their sense of social responsibility subsequently diminished. Under the impact of the epidemic, commodified Higher Education Institutions have reduced their operating costs by stopping the recruitment of new staff, firing staff members, cutting tenure-track positions， and recruiting graduate assistants in order to alleviate their financial crisis, which has to some extent led to a loss of quality assurance in higher education. At the same time, these ways diminished the sense of student learning experience. These universities gain their own private benefits at the expense of the public good. There are also schools that admit only the best students or students from wealthy families in order to produce outstanding students as a way of enhancing the school's reputation and bringing in more lucrative benefits, creating social class and racial disparities in access, and resource allocation. This marketisation of higher education has exacerbated the inequities in higher education . And especially during the epidemic, High School not only has it failed to take up its social responsibility, but has thereby exacerbated a series of social conflicts.

In a deeper analysis, the weakening of social responsibility in American higher education institutions is not an accidental phenomenon, but has some historical roots. Historically, there has been a long-standing "contractual" relationship between American higher education and society. The government has taken a variety of measures to fund public universities and colleges and thereby meet the needs of society. However, with the marketisation of higher education in the US, such a traditional “contract”is gradually being undermined.Not only are private universities in fierce competition with each other, but public universities are also facing serious challenges. Various forms of universities or colleges compete for students, corporate sponsorship, public grants, etc. in order to better survive. The result of this dramatic shift in the value proposition of these universities, which focus primarily on self-interest rather than the public good, is that higher education institutions are unmotivated to take on the obligation to serve society. If the highest norm and ethical standard pursued by a university organisation is profit, then it is difficult for the organisation to bring the positive benefits to society that it deserves. For driven by the overriding aim of utilitarianism, excessive materialistic pursuits are

①②《The biggest income slump since the financial crisis! U.S. Families Face Poverty Nightmare Again"》, International Financial Times, https://www.sohu.com/a/490095960_632979, September15, 2021.
③Poor students in the United States are giving up their college dream and trying to be erased by the epidemic in 20 yearshttps://new.qq.com/rain/a/20200917A01FYB00，September 15, 2020.

bound to be carried out, leading some universities to lose their sense of social responsibility without regard for the plight of the people. Under the impact of the epidemic, one of the outstanding disadvantages of the marketisation of higher education in the United States is that universities have suffered a serious loss of both their own and social benefits, and there is an imbalance in the interaction between universities and society. These phenomena are manifested in various aspects of teaching, research and social services.Higher education is supposed to be responsible for promoting the moral development of students, improving the moral quality of society as a whole and nurturing moral and talented people for social development. However, higher education in the United States is currently not as good as it could be. The culture of schooling, influenced by its value proposition, has developed a strong culture of business and output targets.Such a culture permeates the entire education system in various forms ,and has an ongoing negative impact on society.

Insights into the plight of US higher education in the light of the new crown epidemic

The United States is a powerhouse in higher education. The development of higher education in the United States is not only an important subject of concern to the US government, but also a hot topic of interest to other countries around the world in order to prosper their higher education endeavours. In the 21st century, American higher education is still in the leading position, such as Harvard University, Yale University, Stanford University and other top universities in the world have great influence in the international arena. Therefore, we need to study and explore the characteristics and advantages of American higher education, so as to provide effective reference for the reform and development of higher education in China. However, we need to look at the issue from two perspectives. While the US higher education has absolute advantages that are worthy of learning from, it also has its own disadvantages, especially in the light of the new epidemic. This is a wake-up call for countries to learn from the US higher education reform and development.

First of all, adhere to the "people-centered thinking" to guide the development of higher education

Education is one of the fundamental activities of human existence and development, and an important aspect of governance. Clarifying the question of "for whom" education should be run is a prerequisite for educational activities, and determines the ways, means and methods of educational reform and development. There is a common saying that there is a common way to govern a country, but the people are the mainstay. As an important basic project for people's livelihood, education involves thousands of families and benefits all generations, and is therefore of wide concern to people. The people are the creators of history, and it is by developing higher education for the people that the cause of higher education will be sustainable, which in turn will inject vitality and vigour into social development. Especially in the face of the challenges of the epidemic, there is a need to strengthen the value of the "common good" and to make it clear that education is for the general public, not just for the rich. To this end, it is important to actively seek a concept of the "common good", which encompasses the humanism of higher education while transcending the narrowness of private interests and reconciling the public good with private interests and profit with non-profit. Under this concept, the responsibility and mission of higher education institutions should be enhanced, and the value of higher education should be fully demonstrated.

Especially in the 21st century, knowledge is an important force driving economic development. However, knowledge is only created through well-educated people. In the era of knowledge-based economy, higher education is an important place for the country to train talents and has a profound impact on various fields such as economy, politics, society, culture, and national security. If education thrives, then the country thrives. If education is strong, the country is strong. Education is an important form of social production. If education does not flourish, social production will struggle, economic development will be difficult, and a chain reaction of systems will result. The country will enter a vicious circle. So, the proliferation of old and new problems will inevitably leave the government overwhelmed and in a permanent quandary. The development of people-centred higher education is therefore of strategic importance. It is for this reason that, firstly, the importance of developing people-centred higher education should be given high priority, and the concept of people-centred higher education should be implemented in depth in practice, in an effort to form a synergy that will provide a constant stream of high-quality intellectual support for social development. Secondly, to increase awareness of the crisis. Through a keen sense of crisis proactively recognise the problems within the higher education system, identify gaps and weaknesses. On this basis, actively promote the reform and development of higher education. Thirdly, in promoting higher education, there is a need to enhance the government's education governance capacity. Government is the mainstay of national governance and the key to optimising education governance. On the one hand, the government's clear responsibility for coordinating the distribution of the various administrative bodies of education can avoid the problem of "absence" in educational affairs, and ensure the orderly operation of the education system under the impact of an unexpected crisis and the quality of education for the people. On the other hand, it is necessary to build a sustainable education system, enhance the resilience of higher education, and improve its ability to withstand risks and challenges.

Second, promoting equity in education and building high quality higher education

Education is a fundamental right of the citizens of society. Dewey argued that education is not a luxury, but a necessity. If the privatisation of education is overly reinforced, education will inevitably lose its equity. Once education loses its equity, education will become a luxury for the poor, and quality education will only become quality education for the few, which obviously runs counter to the essential requirements of education. Good education is not only reflected in the improvement of the quality of education, but also in the promotion of equity in education. Otherwise, quality education can only be a feast for the exclusive enjoyment of a few, and such educational inequity will contribute to social inequity; or low-quality educational equity can only be averaged and shared at a low level, which is also not the proper meaning of promoting educational equity. Therefore, we should strive to promote educational equity and build high-quality higher education, so that quality education becomes available to the majority, which is the real pursuit of education and the inevitable choice for social development. Through high quality education, the people's own quality will generally be improved, and the state of ignorance and barbarism of people themselves will be improved, and man's own production will become more and more optimised, with a richer social and material production and a rising civilisation of human society.

The issue of equity is particularly salient when considering the plight of American higher education in the context of the epidemic. In terms of the stratification of US higher education institutions, they are broadly divided into top doctoral-granting universities and liberal arts colleges, general doctoral-granting and other highly selective liberal arts colleges, master's-granting institutions, bachelor's-granting institutions, career-training-oriented associate degree-granting institutions , and community colleges.[2]p99The first two types of institutions of higher education are attended mainly by upper-middle class white students, while the latter three are attended mainly by lower-middle class black, Hispanic, Indian and other minority students. Despite the US government's efforts to alleviate the inequities and increase access to a large number of colleges and universities, the situation has not been fundamentally reversed. Old wounds have not yet healed and new ones have been added. The outbreak and continued spread of the new epidemic has affected the US economy, raising the unemployment rate and increasing the number of working people who have lost their jobs and become homeless, further highlighting the plight of the poor. Families suffering from both economic poverty and the epidemic are struggling to survive, leaving little time for education. Therefore, in the post-epidemic era, the reform and development of higher education should place great emphasis on "equity in education" and "quality in education".

Lastly, mastering the scale of marketisation of higher education.
There has been a trend towards a market-based model of university operation in the United States. As the commercialisation of universities accelerates, market values are gradually replacing the values of university education, and universities are drifting away from the public goals of society. Driven by utilitarian objectives, the social responsibility of some universities has been weakened. In the long run, this pattern will not only damage the university's own effectiveness, but will also have a serious impact on the social effect, which in turn will unbalance the interaction between the university and society. In the case of endowments, there is no denying that they are a source of funding for American institutions of higher education. But endowments can lead to the problem that universities can rely on the interests of donors to shape or change educational policy in order to secure as much funding as possible. From an educational standpoint, it would be appropriate to try to secure funding by first developing our educational policies. In fact, however, some universities have had their educational policies shaped by financial happenstance, which can lead to chaos in university education. This is illustrated by the financial crisis, closures, layoffs, and lack of social responsibility at US institutions of higher education during the New Crown epidemic. Therefore, although marketisation of higher education has its merits, it is important to avoid blind and simple transplantation and to deal with the relationship between government regulation and market allocation according to the needs of the country's stage of development.

Although marketisation of higher education has its merits, such as stimulating the vitality of higher education, diversification of models, and flexibility in management, it also brings a series of negative effects, such as the utilitarianisation of education, the interest-based relationship between teachers and students, imbalance in the education market and inequity in education. Therefore, even the United States, as a powerhouse of higher education, cannot resist many of the problems brought about by marketisation. Therefore, when studying and learning from the US higher education reform and development, we should avoid blind and simple transplantation. The relationship between government regulation and market allocation should be well managed according to the needs of the country's stage of development.

CONCLUSION
The United States is already a powerhouse in higher education, and its experience is worthy of study and learning from other countries. However, American higher education also has its own drawbacks, especially the spread of the epidemic, which has accentuated its shortcomings. This inspires us to maintain a two-pronged approach when absorbing the experiences of other countries. In the process of reforming and developing higher education in other countries around the world, we should not only learn from and absorb the advanced experience of foreign higher education, but also base on our own national conditions and explore the potential of our own higher education, so as to avoid the mistakes of fetishism, dogmatism and bookishness. Each country has different national conditions. Systems, institutions and mechanisms can and do vary greatly from country to country. Therefore,

each country should closely link with its social, economic, cultural and educational history, and current situation, follow the laws of education, actively respond to the trend of the times ,and strive to explore the path of higher education development that suits its own reality, strengthen the policy support needed for the development of higher education, develop a concept of higher education with national characteristics, nurture the intrinsic motivation of higher education development.In this way, all favourable conditions are actively used to promote the high quality of higher education.

Contemporary higher education shoulders the multiple tasks of national political, economic, cultural, scientific and technological development, and is a solid backing for the prosperity and strength of a country. While we fully recognise the importance of developing higher education, we need to face up to the problems that exist in the reform and development of higher education. The problems highlighted by higher education in the United States under the epidemic exist to varying degrees in many countries and also deserve attention. Internationally, every country is faced with this important issue of developing higher education. In order to accelerate the pace of higher education development, we need to take the initiative to learn from foreign countries to carry out advanced educational experiences, and make up for the shortcomings. Domestically, each country has its own traditions and strengths, as well as its own weaknesses. This requires the development of higher education in the country from the actual situation in the country. Optimizing the top-level design of higher education is conducive to better promoting the sustainable development of education. To do this, the relationship between government, market, schools and people has to be managed. A range of issues will be involved in the process. Such as the purpose of higher education development, the way higher education is financed, the structure and form of higher education, the speed and scale of higher education development, the universalisation, informatisation, marketisation and internationalisation of higher education. These issues can constrain the development of society, the progress of science and technology, and the well-being of the people. With the change of domestic and international conditions, new issues and situations will continue to present themselves. Therefore, academics and government officials need to pay great attention to and think deeply about the development of higher education, make concerted efforts to promote its high-quality development, build a solid foundation for enhancing the country's cultural soft power, and better play its important function in cultural diplomacy.

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A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING PRIMARY PREVENTION OF CEREBRO-VASCULAR ACCIDENTS AMONG NURSING STUDENTS OF THE SELECTED NURSING COLLEGE AT JAIPUR.

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ABSTRACT

INTRODUCTION: *Blood pressure is the force of blood pushing against the walls of the arteries as the heart pumps blood. If this pressure rises and stays high over time, known as Hypertension. High blood pressure (hypertension) can quietly damage your body for years before symptoms develop. There is a natural tendency for blood pressure to rise with age due to the reduced elasticity of the arterial system. Age is therefore one of the factors that needs to be taken into account in deciding whether a person blood pressure is too high.*
AIM OF THE STUDY: *assess the effectiveness of structured teaching programme on knowledge regarding primary prevention of the cerebro-vascular accidents among nursing students of the selected nursing colleges at Jaipur.*
MATERIAL AND METHOD*: A pre-experimental one group pre-test post-test study was used in order to evaluate effectiveness of structured teaching programme (the Independent variable) on knowledge regarding primary prevention of the cerebro-vascular accidents (the dependent variable) among nursing students of selected by non-probability purposive sampling technique in nursing colleges at Jaipur. Each participant was informed about the study and that they could withdraw at any time and a written consent was also obtained.*
RESULT: *The finding study showed that the analysis and interpretation of data collected from 60 nursing students of the selected nursing colleges at Jaipur to assess the knowledge regarding primary prevention of the cerebro-vascular accidents. Descriptive and inferential statistics were used for analysis. It was found that pre- test knowledge level of the nursing students was adequate with mean knowledge score 7.83 ± 2.31. It was found that mean post-test knowledge score was significantly higher than mean pre-test knowledge score with mean difference of 9.78 ± 1.75. Showed highly significant difference suggesting that the structured teaching was effective in increasing the knowledge of nursing student's parents regarding primary prevention of the cerebro-vascular accidents.*
CONCLUSION: *It can be concluded that nursing students had adequate knowledge regarding primary prevention of the cerebro-vascular accidents as per current research recommendations. Structured teaching programme was effective in improving the knowledge of nursing students regarding primary prevention of the cerebro-vascular accidents and Regular classes can be conducted for nursing college to refresh their knowledge regarding primary prevention of the cerebro-vascular accidents and encourage them to impart knowledge to nursing students of the selected nursing colleges at Jaipur.*
KEY WORDS: *Knowledge, STP, Nursing Students, Cerebro-vascular accidents.*

INTRODUCTION & BACKGROUND OF THE STUDY

Cerebrovascular accident (CVA), or stroke is a condition where the brain is seriously dam aged by the interrupted or greatly reduced brain blood supply that causes the brain to lack of oxygen and not having enough nutrition to feed the cells. There is not enough blood supply, within minute's brain cells will begin to die. One can completely recover from stroke, or it can lead to dead if it is not treated immediately. The National Institute of Neurological Disorders and Stroke states that stroke is also brain attack – a sudden stoppable blood supply to part of brain. A stroke happens when the clot obstructing the flow of blood to brain or blood vessels rupturing and preventing blood flow to brain. It is a medical emergency when "time is brain", the longer waiting, the more brain cells will die.

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Stroke or cerebrovascular accident (CVA) is a disease which affects the brain function. The brain is vital to our existence. In controls our voluntary movements and it regulates involuntary activities such as breathing and heartbeat. The brain serves as the seat of human consciousness. It stores our memories, enables us to feel emotions, and gives us our personalities. In short, the brain dictates the behaviors that allow us to survive and makes us who we are.

According to the World Health Organization, the epidemic of tobacco is one of the severe public health problems worldwide, it leads to 8 million deaths per years all throughout the planet. Direct tobacco use is killing over than 7 million people and second-hand smoke is the consequences of more than 1.2 million deaths of non-smokers. Smoking significantly raise the risk of coronary heart disease, stroke, lung cancer, diabetes, etc. To be more precise, risk of coronary heart disease and stroke increase by 2 to 4 times because of smoking. It is strongly advised to stop smoking which is a crucial positive change for health. Not only reduce risk factor of cerebrovascular diseases, cancer and other smoking-related diseases, smoking cessation also bring huge benefit for health, maintain, and improve life's quality.

Indian Council of Medical Research (2015) says that Stroke is a major cause for loss of life, limbs and speech in India, estimating there were 9.3 lakh cases of stroke and 6.4 lakhs deaths due to stroke in India, most of the people being less than 45 years old. Experts say that if deaths as well as disability are counted together, then India lost 63 lakhs of disability-adjusted life years in 2004. In India will report 1.6 million cases of stroke annually, at least one-third of whom will be disabled.

Healthcare professionals, especially nurses are in the key role to help patients understand what a cerebrovascular accident (stroke) is, develop an awareness of the risk factors for stroke, provide essential knowledge as well as lifestyle advice, support people to reduce smoking, promote healthy eating and regular exercise to prevent the appearance of this disease through education. Preventing risk factors and stroke occurrences are the most effective method to alleviate the consequences of health and economy of patients.

In order to improve quality healthcare for the population, health professionals provide crucial services that promote health and prevent diseases. As such, nurse is primarily an educator who provides information and guidance to populations so as to promote healthy lifestyles. (WHO 2021.) Patient education is one of the most essential roles of nurse in primary prevention of illness. So, in cases of cerebrovascular accidents, the nurse's responsibility is to encourage patients to adopt a healthy lifestyle by engaging in physical activities and balanced diet as well as reducing tobacco and alcohol consumption. Besides, nurses also motivate high-risk people to take preventive medication, for example, antihypertensive, anticoagulant, lipid-lowering drugs, etc. Furthermore, by planning and delivering health promotion intervention, nurse raises awareness of risk factors to reduce stroke occur in the future. Nurses are not only educators but are also researchers in primary prevention of stroke. They evaluate current preventive services and research development to enhance stroke prevention services better. In addition, nurses serve as clinical leader and manager in stroke prevention. Thus researcher decided to do a interventional study to educate nurses regarding prevention of the stroke as nurses are the first person who used to be contacted by community people.

OBJECTIVES OF THE STUDY

- To assess the existing knowledge level regarding primary prevention of the cerebro-vascular accidents among nursing students of the selected nursing colleges at Jaipur.
- To evaluate the effectiveness of the structured teaching program on knowledge regarding primary prevention of the cerebro-vascular accidents among nursing students of the selected nursing colleges at Jaipur.
- To find association between baseline knowledge level regarding primary prevention of the cerebro-vascular accidents and selected demographic variables of nursing students of the selected nursing colleges at Jaipur.

HYPOTHESIS OF THE STUDY

- H1. There will be a significant increase in knowledge level regarding primary prevention of the cerebro-vascular accidents after structured teaching program among nursing students of the selected nursing colleges at significance level <0.05.
- H2. There will be a significant association between baseline knowledge level regarding primary prevention of the cerebro-vascular accidents among nursing students of the selected nursing colleges and selected demographic variables at significance level <0.05.

OPERATIONAL DEFINITION

- **ASSESS:** It refers to examine the knowledge level regarding primary prevention of the cerebro vascular accidents among nursing students.
- **KNOWLEDGE:** In this study it refers to the information regarding primary prevention of the cerebro vascular accidents acquired from nursing students through a structured knowledge questionnaire. It will be assessed through structured

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knowledge questionnaire. Score above 75% indicates adequate knowledge.

- **EFFECTIVENESS:** It refers to the change in the knowledge level after administration of the structured teaching program on primary prevention of the cerebro-vascular accidents measured through structured knowledge questionnaire.
- **PREVENTION:** - In this study it refers to the measures need to be taken to reduce the risk of stroke like, dietary modification, physical workout, yoga, meditation, regular health check-up, controlling hypertension and diabetes.
- **STROKE: -** It refers to the rapid loss of brain function duo to disturbance in the blood supply the brain. This can be due to ischemia (lack of blood flow) caused by blockage (thrombosis, arterial embolism), or a haemorrhage.
- **NURSING STUDENTS: -** In this study nursing students refers to undergraduates, BSc Nursing students, and GNM.

ASSUMPTION

- Nurses may have average knowledge regarding primary prevention of the cerebrovascular accidents.
- The knowledge regarding primary prevention of the cerebrovascular accidents may vary with the selected demographic variables of nursing students of the selected nursing colleges at Jaipur.
- The STP on primary prevention of the cerebrovascular accidents may improve the knowledge of nursing students of the selected nursing colleges at Jaipur.

DELIMITATION

- The study is delimited to undergraduates nursing students of selected nursing colleges.

RESEARCH METHODOLOGY

- **RESEARCH APPROACH**
- A Quantitative research was used in the study to effectiveness of structured teaching programme on knowledge regarding primary prevention of the cerebrovascular accidents among nursing students of the selected nursing colleges at Jaipur.
- **RESEARCH DESIGN**
  A pre-experimental design, one group pre-test post-test design was adopted for the study.

RESEARCH VARIABLE

- **Independent variable**: Structured teaching programme regarding primary prevention of the cerebrovascular accidents.
- **Dependent variable**: Knowledge regarding primary prevention of the cerebrovascular accidents among nursing students of the selected nursing colleges at Jaipur.
- **Demographic variables:** Demographic profile of parents such as age, gender, course of nursing student, religion and previously attended seminar or any educational program on Cerebro-vascular accident-vascular accident.

POPULATION

- In this study target population was nursing students of the selected nursing colleges at Jaipur.

SAMPLING SIZE

In this study, the sample consist 60 nursing students.

SAMPLING TECHNIQUE

- The sampling technique used in this study was purposive sampling technique. This entails the use of the most readily available persons in a study. Sample who meet the criteria for sample selection were selected.

RELIABLITY OF THE TOOL

- The tool was tested for reliability for using split half method and Spearman brown coefficient formula. Correlation coefficient r =0.94.

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MAJOR FINDING OF THE STUDY

Table 1
Frequency and percentage distribution of demographic variables among nursing students.
(N=60)

S. No	Socio-demographic variable		Frequency	Percentage
1	Age	20-21 years 22-23 years >23 years	7 39 14	11.07 % 65.00 % 23.03 %
2	Gender	Male Female	26 34	43.03 % 56.07 %
3	Residence	Urban Rural	44 16	73.03 % 26.07 %
4	Course	B.Sc. Nursing GNM	34 26	56.07 % 43.03 %
5	Previous Workshop/ seminar attended for prevention of CVA	Yes No	40 20	66.06 % 33.04 %

Table 1 Depicted that the nursing students participated in the study, Relation with Age (in years) 22-23 (39, 65%), Gender Female (34, 56.07%), Residence Urban (44, 73.03%), Course B.Sc. Nursing (34, 56.07%), Previous attend seminar & workshop Yes (40, 66.06%).

Table No. 2: Frequency and percentage distribution of the samples pre-test level of knowledge regarding primary prevention of the cerebrovascular accidents. (N=60)

KNOWLEDGE LEVEL	PRE TEST		POST TEST	
	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE
adequate	40	66.7 %	52	86.7 %
Moderate adequate	16	26.07 %	08	13.3 %
Poor	04	6.7 %	00	00 %
Mean	7.83		9.78	
SD	2.31		1.75	

Table No. 2 depicted that the pre-test knowledge regarding primary prevention of the cerebrovascular accidents among nursing students. The major finding are 86.7% of nursing students had adequate knowledge. The overall pre-test mean percentage knowledge score is 66.7% with the mean of 7.83 ± 2.31 Based on the findings we can conclude that the overall and as well as its different aspects pre-test adequate. In posttest majority (86.7%) the sample had adequate knowledge, followed by 13.3% with the mean of 9.78 ± 1.75 had moderately adequate knowledge and no one had the poor knowledge regarding prevention of the Cerebrovascular accidents. Based on the findings we can conclude that the overall and as well as its majority aspects post-test knowledge score of samples regarding prevention of the Cerebrovascular accidents.

Table No. 3: Mean difference of the pre-test and post-test knowledge score of nursing students regarding prevention of the Cerebrovascular accidents
(N=60)

Test	Mean difference	t test	df	P value
Pre-test Knowledge Score	7.16±4.95	8.07	59	<0.001*
Introductory	1.16±1.40	6.43	59	<0.001*
Sign & Symptoms	0.10±0.57	1.35	59	0.1
Management	0.81 0.70	8.21	59	<0.001*
Awareness	1.13±1.87	4.68	59	<0.001*
Prevention	1.95±2.55	5.91	59	<0.001*

Table No. 3 shows that, the depicts association of knowledge level regarding prevention of the Cerebrovascular accidents among Nursing students with their socio demographic characteristics. The association is calculated using chi square. A statistical significant association is found between knowledge level regarding prevention of the cerebrovascular accident and age and previous workshop/seminar attended for prevention of CVA. In the light of above findings table.3 statistical significant association between knowledge level regarding prevention of the cerebrovascular accident and age and previous workshop/seminar attended for

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prevention of CVA at <0.05 level of significance. Hence H02 there will not be a significant association between knowledge level regarding primary prevention of the cerebro-vascular accidents among nursing students of the selected nursing colleges and selected demographic variables at significance level <0.05 is rejected and H2 is accepted.

DISCUSSION

The hypothesis made in the study is there is significant difference in pretest and post test scores on aspects of knowledge regarding prevention of the cerebrovascular accident among nursing students with selected socio- demographic variables at the level of $P < 0.05$. There is significant association between pre-test knowledge score on prevention of the cerebrovascular accident and selected socio demographic variables of nursing students at the level of $p \leq 0.05$.

- The three assumptions were made in this study. The first one was the finding of the study reveals that after introducing the STP, the nursing students may have average knowledge regarding primary prevention of the cerebrovascular accidents. Similar studies were also done in different parts of the country and same results were found that all the nursing students were having excellent knowledge regarding primary prevention of the cerebrovascular accidents.
- The second assumption was the finding of the study reveals that the knowledge regarding primary prevention of the cerebrovascular accidents may vary with the selected demographic variables of nursing students of the selected nursing colleges at Jaipur.
- The third assumption was The STP on primary prevention of the cerebrovascular accidents may improve the knowledge of parents having nursing students of the selected nursing colleges at Jaipur.

CONCLUSION

The present study assessed the effectiveness of structured teaching program. The study findings revealed that there was a significant improvement in the level of knowledge after providing structured teaching program. Based on the statistical findings, it was evident that provision of such kind of structured teaching program would motivate the students and help them to acquire knowledge regarding care of the patient with Cerebero Vascular Accident. Therefore structured teaching program was very important to provide quality-nursing care which helps to meet the needs of the patients for their well-being.

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THERMAL ANALYSIS OF THE CRYOGENIC PROPELLANT TANK IN LAUNCH VEHICLES

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ABSTRACT
Cryogenic propellants that have been sub-cooled are placed into cryogenic tanks utilized for space applications. A heated layer of liquid forms close to the liquid-vapor interface during the protracted periods of time before launch when heat from outside sources escapes into the tank. Thermal stratification is the term for this process.

A transient, two-phase, thermodynamic model of thermal stratification in a cryogenic tank was constructed in this work. The model considers the flow of the propellant boundary layer caused by nearby natural convection. MATLAB was used to solve equations relating to continuity, momentum, energy, and mass transfer.

Studies were then conducted to ascertain the impact of stratified mass liquid temperature and liquid Pressure profile on liquid sub-cooling in the propellant tank. According to the study, sub-cooling the cryogenic tank results in a higher stratified mass.

The findings of this study can be applied to enhance cryogenic tanks' operation and design for space applications.

Specific Objective-

- *To establish the variation of temperature and pressure with the heat radiant on the outside wall of the tank.*
- *To identify any factors affecting the relationship between temperature, pressure, and radiant heat.*

KEYWORDS- *Cryogenic Tank, Insulation, Thermal Stratification, Liquid Hydrogen.*

1. NOMENCLATURE

A -Surface area (m2)
Cp -Specific heat (J/Kg-K)
D -Tank diameter (m)
d -Port diameter (m)
g -Gravity (m/s2)
H -Enthalpy (J/kg)
h -Heat transfer coefficient (W/m2 -K)
h_fg -Latent heat of vaporization (J/K)
k -Thermal conductivity (W/m-K)
m -Resident mass (Kg)
Nu -Nusselt number
Pr -Prandtl number
Gr -Grashof number
P -Pressure (Pa)
Q -Heat (J)
Ra -Rayleigh number
Re -Reynolds number
T -Temperature (K)
t -Time (s)
U -Boundary flow velocity (m/s)
x -Tank height (m)

Subscripts

a -Ambient conv Convection
int -Liquid-vapor interface
l -Liquid
s -Tank outer surface

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u -Ullage
v -Vapor
w -Inner wall

2. INTRODUCTION

Many technical applications, including the storage of rocket propellant, liquefied fuel, and air separation systems, typically employ cryogenic fluids such as liquid nitrogen (LN2), liquid hydrogen (LH2), liquid oxygen (LOX), and liquefied natural gas (LNG) in tanks. When there are thermal demands from the environment, the temperature of these storage containers rises. the tank used to store petrol. Before the combustion chamber is opened in cryogenic launch rockets, fluid travels through the propellant tank through a turbo pump. when the fluid used in the pump's intake warms up the potential for pump cavitation to exceed the "limiting temperature" or cavitation limit. As a result, the liquid inside the tank that is warmer than the limitation threshold cannot be utilized for burning, rendering the stratified mass of propellant useless. Stratified propellant mass is considered when calculating the launch vehicle's payload penalty but, in this paper, we won't consider the stratified mass. Highly effective insulation is employed to lessen the stratified mass and decrease heat leakage into the tank. A crucial factor in the design of the propellant tank and the effectiveness of the launch vehicle systems is the temperature of the liquid. To build the cryogenic fluid system utilized in launch vehicles, it is crucial to accurately estimate how temperature and pressure will change over time in the propellant tank. engine with unstable cryogenic combustion.

Although there are many books on stratification, relatively few of them investigate the stratification process for various liquid sub-cooling conditions. The estimation of temperature under various sub-cooling levels is crucial because cryogenic launch vehicle systems demand sub-cooled propellant at the intake of its turbo-pump. LH2 is used as the working fluid in the current study to evaluate the temperature stratification phenomena. The development of a two-phase thermal stratification model considers the liquid's inherent convection currents caused by heat leaks. The experimental data published in the literature [1] are used to validate the numerical model, and the data are also used to compare the rate of increase in liquid temperature over time.

3. MODEL DESCRIPTION

A typical liquid hydrogen tank, having a diameter of 4m, length of 7m, wall thickness of 4mm, and various foam-insulation thicknesses of 10mm, 20mm, 30mm, and 40mm, consider the whole wall thickness as a summation of insulation thickness and tank wall to ease the calculation and liquid level filled up to 80% of the total height.

In an axis-symmetric tank, thermal stratification is brought on by a complicated two-dimensional boundary layer phenomenon that occurs near the tank wall. To predict the development of pressure and bulk fluid temperatures when various thermodynamic transients in the tank occur. It is presumed that the temperature differential between the interface and the bulk liquid is not large enough, thus making it simpler to predict how the temperature of the bulk fluid will change over time.

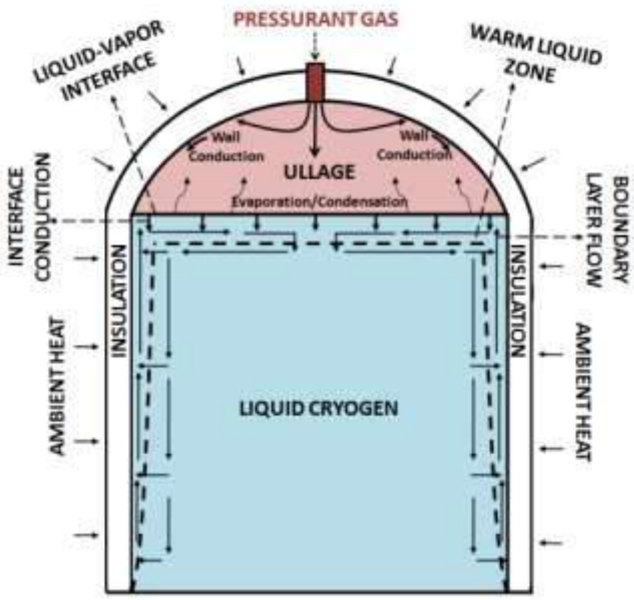

Figure 1: Actual model of cryogenic propellant tank

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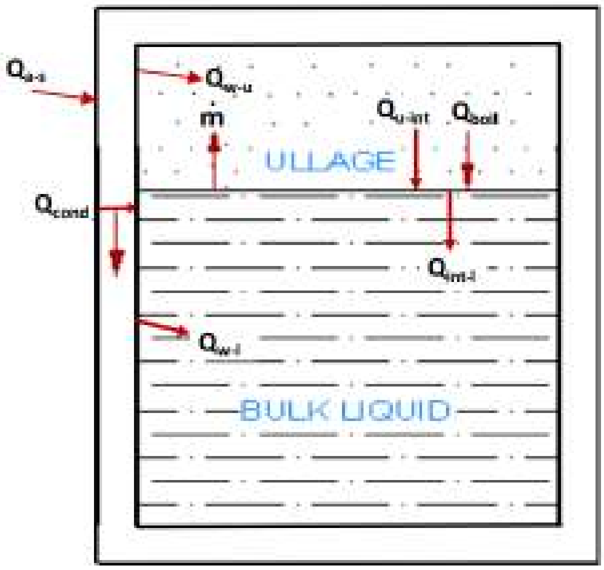

Figure 2: An approximated model of a cryogenic propellant tank

4. SOLUTION METHODOLOGY

Since utilizing the nodal approach to solve the problem, divide the tank capacity into two sections and treated the liquid portion as the first node while treating the ullage portion as a second node. And consider wall thickness as another node to find the temperature variation at the inside wall's surface with different heat radiant at the outside. Now apply the Continuity, momentum, energy, mass transfer equations, and equation of state to solve the problem. At the wall thickness, use the Transient heat conduction equation to evaluate the variation of temperature.
Mathematical equations used for the calculation of the parameter of tank capacity-

4.1 Conservation of Mass

The rate of change of mass in the control volume is equivalent to the net mass flow from a fluid node, as shown below.

$$\dot{m}_{up} - \dot{m}_{down} = \frac{dm}{dt}$$

4.2 Conservation of Momentum

A more complicated version of Newton's second law serves as the governing equation for flow connections. The following is how to write the momentum conservation equation for a fluid connector.

$$\frac{dm}{dt} = \frac{A_c}{L} \cdot \left[\left(P_{up} - P_{down}\right) - f \cdot \frac{1}{2\rho A_c^{\,2}} \cdot \left(\frac{dm}{dt}\right)^2 \right]$$

The Churchill formulation is used to compute the viscous coefficient 'f'. Momentum conservation is imposed on the fluid connectors that join the fluid nodes.

4.3 Conservation of Energy

The first law of thermodynamics serves as the foundation for the expression of the energy conservation equation. The difference between the rate of energy transport into the control volume and the rate of energy transport out of the control volume equals the rate of increase of internal energy in the control volume. Thus, the enthalpy-based energy conservation equation may be expressed as follows:

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$$\frac{dU}{dt} = \left(H_{up}\dot{m}_{up} - H_{down}\dot{m}_{down}\right) + \frac{dQ}{dt}$$

Where:

$$\frac{dQ}{dt} = hA(T_w - T_{l,u})$$

where Q, shown below, represents heat in-leak from ambient at boundary fluid nodes with heat transfer coefficient (h).

4.4 Equation of State

Thermodynamic variables at a particular fluid lump are calculated using a real fluid state equation with compressibility factor, Z, being input from the NIST database.

$$P = Z.\frac{m}{V}.\frac{R}{M}.T$$

Now, discuss each part of the tank capacity one by one

5. COMPONENTS OF NODES

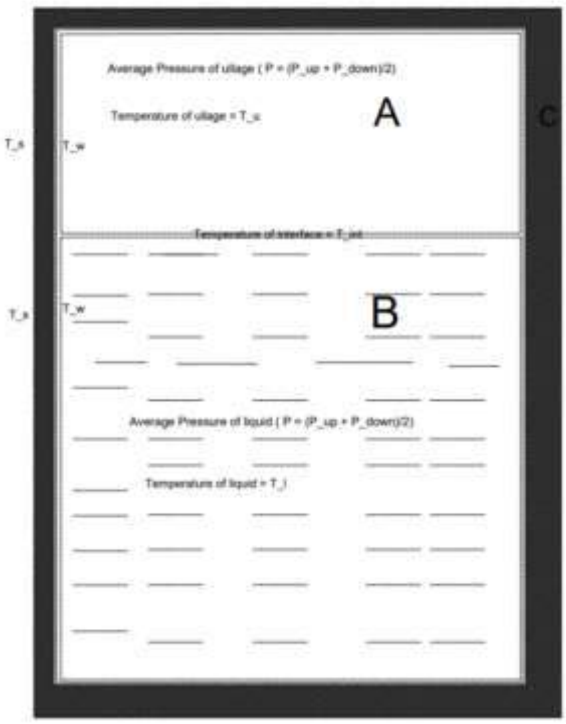

Figure 3: Distribution of nodes within the capacity of the tank and on the wall

Where A is the first node for the ULLAGE part, B is the second node for the Liquid part, and C is the node for the tank metal with insulation. Now analyze each node separately:

5.1 For the tank walls and insulation

Consider the whole tank and insulation as a single node as shown in Figure 3, and apply a transient heat conduction equation on the tank thickness to estimate the variation of inside wall temperature(T_w). the steady-state temperature of the inner wall is determined by the heat flux and the thermal conductivity of the wall material.

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$$\rho c_p \frac{\partial T}{\partial t} = k \frac{\partial^2 T}{\partial x^2} - q$$

Where the 'q' is the constant heat flux applied on the outer surface of the tank. And atmospheric temperature is maintained at 298.15 K. Equations that will be used for the Tank wall and fluid parts are decoupled. assume that:

- q= 2600 W/m^2
- k/rho*Cp) = 4.96 * 10^-7 m^2/s
- L = 3.3cm
- K= 0.02 W/mk
- Initial temp. = 20K

then the result of the variation of inside wall temperature will look like:

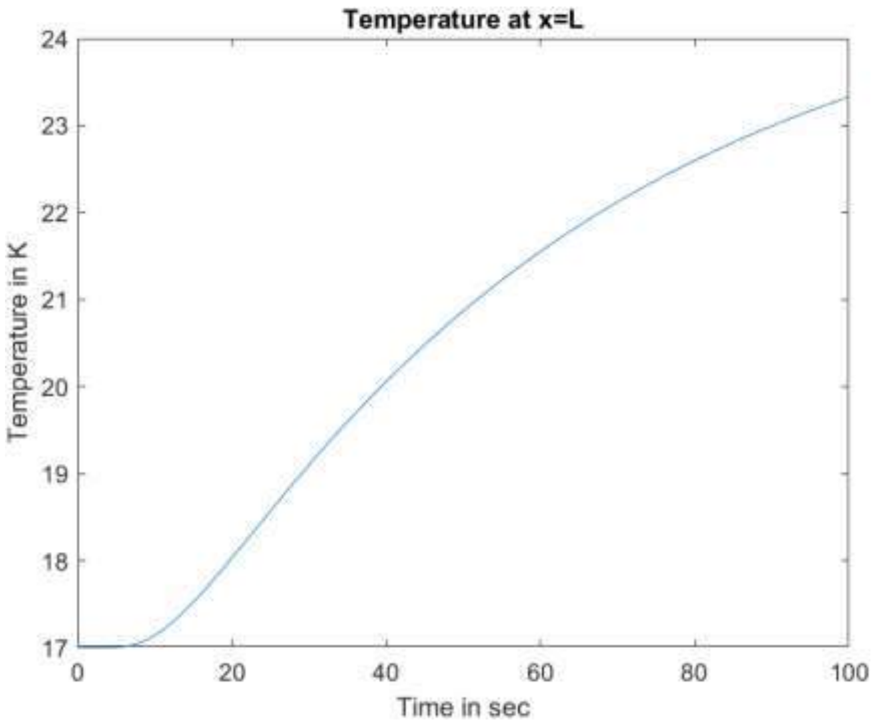

Figure 3: Variation of inner wall temperature with the time

The graph shows that the temperature of the inner wall initially increases rapidly as the heat flux is applied. This is because the heat flux is transferred to the inner wall through conduction, which is a relatively slow process. However, the temperature eventually reaches a steady state after very long time, where the rate of heat transfer through the wall is equal to the rate of heat loss from the wall to the cryogenic fluid. The steady-state temperature of the inner wall is determined by the heat flux and the thermal conductivity of the wall material. The higher the heat flux, the higher the steady-state temperature. The higher the thermal conductivity of the wall material, the lower the steady-state temperature.

5.2 For the liquid part

In a similar way for the liquid part, consider a single node to the whole liquid volume and apply the conservation equations and equation of state to find the variables. Where we need to estimate the variation of "Pressure (P_up and P_down)" and "Temperature(T_u)" of liquid.

So, assume the following properties of liquid hydrogen:

- Specific heat(Cp_l)= 16.403+0.878*(T_l-17)
- Heat transfer coefficent= 0.11 * ((9.8*17*10^(-3)*(T_wT_l)*L_l^3)/((v_l)^2))^(0.25)*(k_l/L)
- dm/dt = volume flow rate * density
- Enthalpy = Cp_l*(T_l-17)

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- Density= 234.91/(1+(17*10^(-3)*(T_l-17)))
- Height of liquid (L_l)= 0.8*L (this approx. relation came from a previous experiment performed)
- Friction factor= 0.0075
- Molecular mass=2
- A_l=3.14*D*L_l • Ac=3.14*(D/2)*(D/2)
- Mass flow rate downstream (m_down_l)= 0

Note: all the above-assumed values came from the NIST datasheet

Then the variation of temperature and pressure will look like:

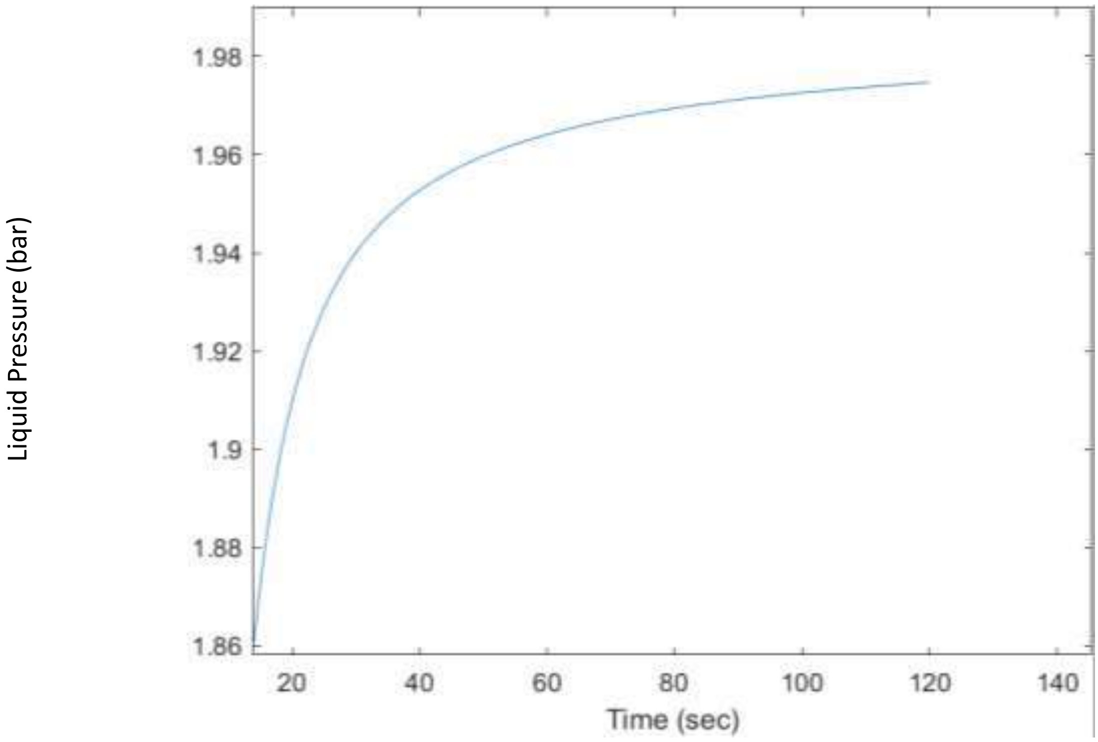

Figure 5: Liquid bulk Pressure Vs time of LH2

The graph shows the liquid pressure inside a cryogenic tank of liquid hydrogen as a function of time. The x-axis of the graph shows the time in seconds, and the y-axis shows the liquid pressure in the bar. The initial liquid pressure in the tank is about 1.5 bar. After 20 seconds, the liquid pressure increased to about 1.9 bar. After 40 seconds, the liquid pressure increased to about 1.94 MPa.

The liquid pressure continues to increase relatively steadily until about 120 seconds when it starts to level off. This is because the rate of evaporation of the liquid hydrogen slows down as the temperature of the liquid hydrogen decreases. the maximum liquid pressure in the tank is about 1.98 bar.

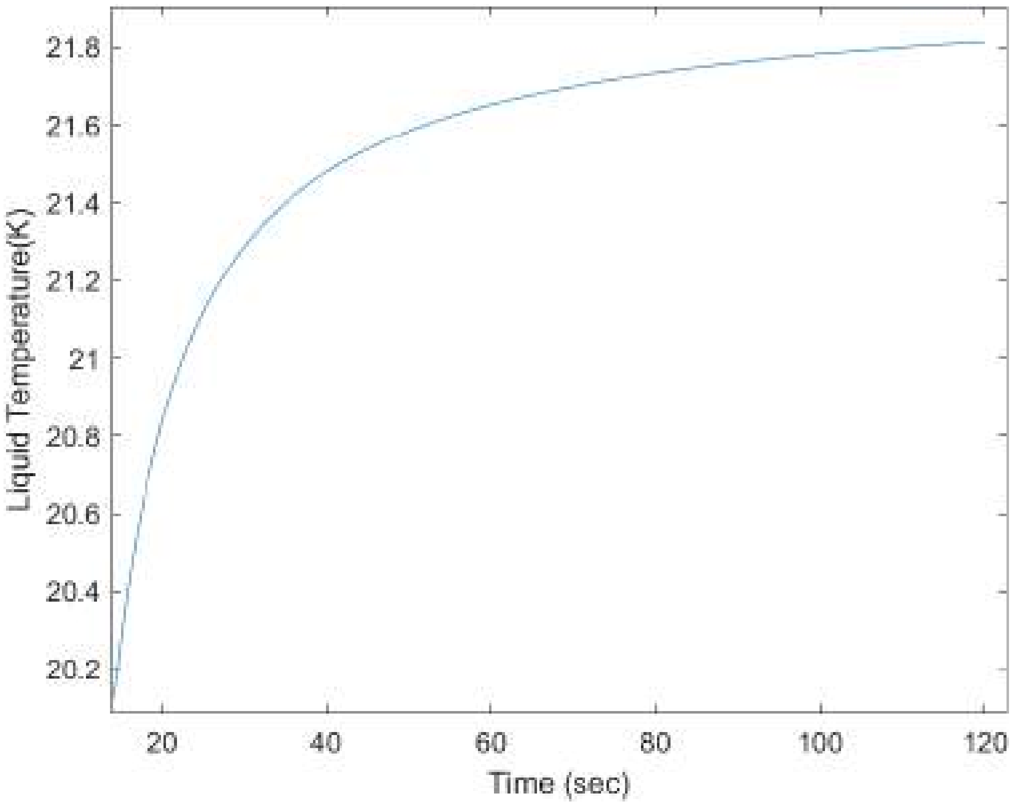

Figure 6: Liquid Bulk Temperature Vs time of LH2

The temperature starts at around 20 K and gradually increases to around 22 K(B.P.). The graph also shows that the rate of temperature increase is not constant. The graph you sent me shows the liquid temperature of a substance as a function of time. The x-axis of the graph shows the time in seconds, and the y-axis shows the liquid temperature in Kelvin (K). The data points on the graph show that the liquid temperature decreases as time goes on. This is because the liquid is being heated, and the heat is causing the liquid to vaporize.

The initial liquid temperature in the tank is about 20 K, After 20 seconds, the liquid temperature increased to about 20.4 K, After 40 seconds, the liquid temperature increased to about 21.4 K and after 120 sec. the temperature will steady at 21.8 K because the liquid hydrogen boiling point is at 22 K.

5.3 For the Ullage part

Similarly, consider another node for the whole ullage part to estimate the variation of temperature and pressure of hydrogen gas. Assume that:

- Height of ullage=0.2*L
- Friction factor= 0.015
- Molecular mass=2
- A_u=3.14*D*L_u
- Ac=3.14*(D/2)*(D/2)
- m_up_u= 0
- Density= 234.91/(1+(17*10^(-3)*(T_u-17)))
- Enthalpy= Cp_u*(T_u-17) = Hdown
- Specific heat(Cp_u)= 25.313+1.1*(T_u-17)
- Heat transfer coefficent= 0.024*T_u^(0.5)*P_u^(-0.5)
- dm/dt = volume flow rate * density

Note: All the above-assumed values came from the NIST datasheet

The variation of pressure and temperature of gas will look like:

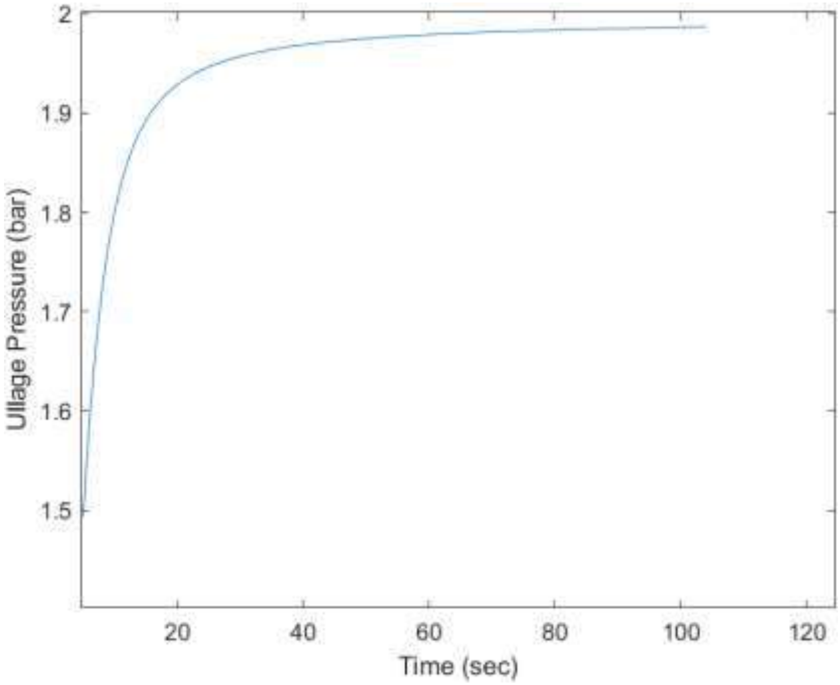

Figure 7: Ullage Pressure Vs time of LH2

The graph shows the ullage pressure vs. time of a cryogenic propellant tank. The ullage pressure is the vapor pressure above the liquid hydrogen in the tank. The graph shows that the ullage pressure increases over time as the liquid propellant is consumed. The initial ullage pressure is about 1.5 bar. The ullage pressure then increases rapidly to about 1.9 bar in the first 20 seconds. The ullage pressure then increases gradually to about 2 bar over the next 100 seconds. This is because the liquid propellant temperature is near to its steady value so the rate of evaporation will slow down.

The variation of ullage temperature with respect to time shown below

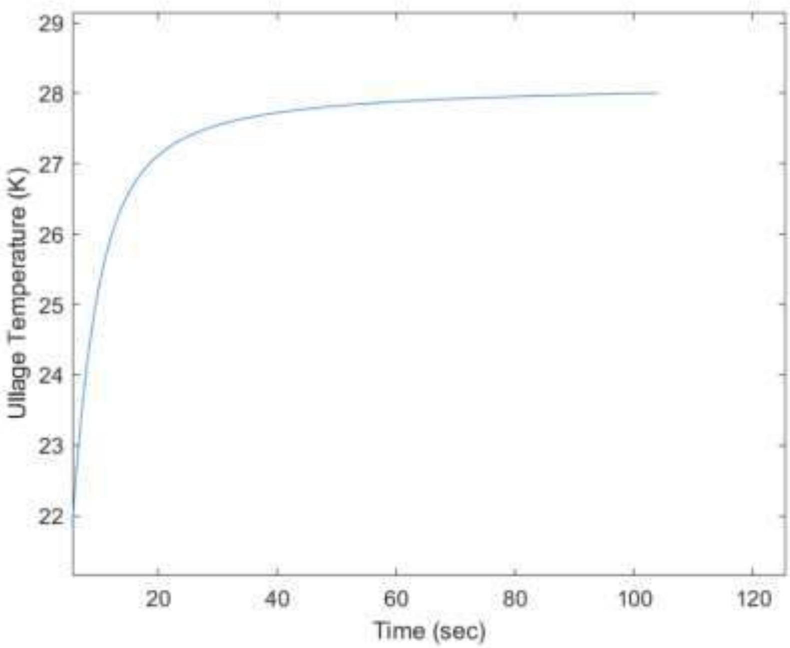

Figure 8: Liquid Temperature Vs time of LH2

The graph shows the ullage temperature vs. time of a cryogenic propellant tank. The ullage temperature is the vapor temperature above the liquid hydrogen in the tank. The graph shows that the ullage temperature increases over time as the liquid propellant is consumed. The initial ullage pressure is about 22 K. The ullage temperature then increases rapidly to about 25K in the first 20 seconds. The ullage temperature then increases gradually to about 28K over the next 100 seconds. This is because the liquid propellant temperature is near to its steady value so the rate of evaporation will slow down.

6.CONCLUSION AND RESULT

To understand how insulation thickness affects the development of the tank's pressure and temperature, a transient, two-phase thermodynamic model of a liquid hydrogen cryogenic propellant tank utilized in a typical launch mission is built. As time passes temperature and pressure of the cryogenic tank increase till their steady value but not exceeding 2 degrees Celsius except for the ullage temperature profile.
Following are the salient conclusions drawn from the analyses:

- Lower insulation thickness above cryogenic tanks causes a larger heat infiltration into ullage gas, which considerably raises tank pressure.
- The development of the stratified mass is significantly influenced by tank pressure, which affects interface temperature. A higher tank pressure results in a greater mass of liquid stratified.
- Propeller tanks used in launch vehicles suffer a payload penalty because of the increased temperature because of higher liquid heat infiltration from the environment when tank insulation is thinner.
- Due to a larger ullage heat in-leak, thinner tank insulation reduces the amount of pressuring mass needed to pressurize the tank. After pressurization, a larger ullage mass must thus be released in order to maintain consistent tank pressure.
- The solar flux and ambient temperature have an impact on the tank's outer surface temperature, which in turn impacts the heat in-leak and ultimately the tank pressure.

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A CORPORATE STUDY ON CASH FLOW STATEMENT OF PRIVATE ANDPUBLIC SECTOR BANKS

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ABSTRACT
This study examines the cash flow statements of private and public sector banks. Through a comparative analysis, it delves into the financial dynamics and liquidity management strategies of both sectors. By scrutinizing cash flows from operating, investing, and financing activities, the study uncovers distinctive patterns in each sector's cash flow structure. Factors influencing cash flow performance are explored, including regulatory frameworks and market conditions. The study's insights offer valuable understanding for stakeholders, highlighting key drivers of cash flow variations between private and public sector banks. Ultimately, this research sheds light on the financial resilience and adaptability of these institutions, contributing to a broader comprehension of banking sector dynamics and performance.
KEYWORDS: *banking products, comparative analysis, features, benefits, performance, interest rates, fees, customer service, rewards, user experience.*

INTRODUCTION
Banking area has a significant spot in our Indian economy. It encouraging people to save, mobilizing the savings for the investment purpose in various sectors of the economy, promotebalanced regional development by providing financial infrastructure and funds for backward regions, promotes primary sector by providing agriculture loans, helps governmentto fulfil objectives for economic development, help the process of capital formation. Banks have principal role of converting liquid deposits into illiquid assets like loans, which makes them constitutionally weak to liquidity risk (Hantal, 2015). The liquidity management showshow efficiently a bank manages its short-term requirements and invests the funds to raise theprofitability of the Bank.

Besides, the illiquidity will lead to insolvency and bankruptcy therefore lack of cash orliquidityis an indicator of crises in the banking sector therefore liquidity management is an important objective of any bank (Srinivason and Britto, 2017). Management of liquidity or cash helps inanalysis of financial performance.

REVIEW OF LITERATURE
- **Das (2017)** 40 compared one public sector i.e., State Bank of India and one private sector banki.e., ICICI Bank by evaluating their cash flow statement for five financial years from 2009-10to 2013-14. According to this study, level of performance of ICICIis superior to SBI. Also, cash balance of a firm is too easily influenced by post pointingcash receipts and cash paymentsand as the selected two banks maintain books of Accounts under accrual basis, so cash flow analysis fails to predict the actual result ofthe organization.
- **Sri (2017)**41analyzed the cash flow statement with special reference to JET Airways.The study, it was found that the company has no effect on the foreign exchange fluctuations, cash and cash equivalents of subsidiaries under liquidations and the company use more cash and cash equivalents more than the power and fuel cost compared to workers salary.

STATEMENT OF THE PROBLEM
This study evaluated public and private sector bank on basis of cash flow from operating activities, financing activities and investing activities. It is useful for stakeholders who want toinvest in the banks to know about liquidity position of the bank and heavily the interest in the banks. This study also helps in analyze the trends of various activities of selectedbanks.

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OBJECTIVES OF THE STUDY

- To study the trends of various activities such as operating, investing andfinancing ofselected banks.
- To analyze the variations amongst three activities i.e., operating,investing andfinancing of selected banks.
- To compare various activities such as operating, investing andfinancing of selectedbanks.

METHODOLOGY OF THE STUDY

In this study, Descriptive and analytical research design have been used. For this purpose, cashflow statement of both public and private sector selected banks collected and analyzed by using comparative bar charts and various suitable statistical tools then interpretation drawn accordingly.

Source of data

In this study, secondary data collected. Secondary data obtained from the sources i.e., publishedannual reports of the various banks for the financial years- 2009-2010 to 2017- 2018, directoryof Mumbai Stock Exchange, websites of selected Banks i.e., SBI, BOB, PNB, Canara bank, HDFC bank, ICICI bank, Kotak Mahindra, Axis bank, trends and progress report of RBI andIBAs' report of various banks.

Sampling

For the purpose of the study top five public sector banks and five private sector banks have been selected according to the market capitalization i.e., SBI, BOB, PNB, Canara Bank, HDFCBank, ICICI Bank, Kotak Mahindra, Axis Bank.

Period of the study

The study conducted for a period of eight financial years i.e., from 1-4-2010 to 31-3-2018.

Statistical tools

All tabulated data are analyses with the help of statistical tools for proving and disproving thehypothesis. The study used Standard Deviation (SD), Co-efficient of variation (COV) etc. forthe analysis of the collected data for the selected banks.

ANALYSIS AND INTERPRETATION

TABLE 01
Cash Flow from Operating Activities of all selected Banks

(Rs. in Crore)

Year	SBI	BOB	PNB	CANARA	HDFC	ICICI	KOTAK MAHINDRA	AXIS
2011	34282.27	11778.8	8045.67	8527.35	-375.83	-6908.92	-1474.47	11425.07
2012	28468.58	14406.5	-811.22	-832.22	-11355.61	9683.82	-3922.92	-9826.93
2013	21661.23	22793.1	-1886.71	8542.65	-1868.78	11102.01	-1405.46	2719.04
2014	14107.42	41016.3	17729.1	9535.20	8363.60	4668.60	9001.63	16702.56
2015	27621.03	18021.0	5618.67	4547.09	-15862.27	-4824.49	5121.93	-12922.02
2016	11195.55	-9841.66	17615.3	6078.45	-3224.67	22428.47	6133.72	-15971.85
2017	11060.32	17193.8	12497.0	2316.15	23585.4	39222.81	14411.92	34192.28
2018	-85425.2	-61087.8	1011.69	-11503.83	26074.07	13303.65	-10274.92	-46693.30

INTERPRETATION

From table 4.1.1, it is observed that SBI has the highest cash flow in 2011 and negative cash flow in 2018 which shows bank has more cash outflow in operations in 2018. In case of BOB,the highest cash flow is in 2014 and negative cash flow in 2016 and 2018 which indicates bankhas more cash outflow than inflow in operations in 2016 and 2018. In case of PNB, the highestcash flow is in 2014 and negative cash flow in 2013 which indicates more cash outflow and 2014 onwards cash flow of PNB is positive and satisfactory which represent good liquidity position of PNB. In case of Canara Bank, the highest cash flow is in 2014 and lowest cash flow in 2018.

From table 4.1 it is also observed that HDFC has the highest cash flow in 2018 and negative cash flow in 2015 which indicates bank has more cash outflow in operations in 2018. In caseof ICICI, the highest cash flow is in 2017 and lowest cash flow in 2009 which indicates bankhas more cash outflow than inflow in operations in 2011. In case of Kotak Mahindra, the highest cash flow is in 2017 and negative cash flow in 2018 which indicates week liquidity position. In case of Axis, the highest cash flow is also in 2017 and negative cash flow in 2018.

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TABLE 02
Cash Flow from Investing Activities of all Selected Banks

(Rs. in Crore)

Year	SBI	BOB	PNB	CANARA	HDFC	ICICI	KOTAK MAHINDRA	AXIS
2011	34282.27	11778.8	8045.67	8527.35	-375.83	-6908.92	-1474.47	11425.07
2012	28468.58	14406.5	-811.22	-832.22	-11355.61	9683.82	-3922.92	-9826.93
2013	21661.23	22793.1	-1886.71	8542.65	-1868.78	11102.01	-1405.46	2719.04
2014	14107.42	41016.3	17729.1	9535.20	8363.60	4668.60	9001.63	16702.56
2015	27621.03	18021.0	5618.67	4547.09	-15862.27	-4824.49	5121.93	-12922.02
2016	11195.55	-9841.66	17615.3	6078.45	-3224.67	22428.47	6133.72	-15971.85
2017	11060.32	17193.8	12497.0	2316.15	23585.4	39222.81	14411.92	34192.28
2018	-85425.2	-61087.8	1011.69	-11503.83	26074.07	13303.65	-10274.92	-46693.30

INTERPRETATION
From table 4.1.2, it is observed the SBI invest more in 2011 and 2018 and get less cash return from investing in those years but get back cash flow from investing activities more in 2011. BOB invest more in 2016, 2017 and 2018 and get less return from investment but it has highestcash flow from investment in 2014. PNB invest more in 2012 and 2013 and have highest cash flow from investment in 2014. Canara Bank invests more in 2009, 2012 and 2018 and highest cash flow from investment in 2014.

From table 4.1.2, it is also observed that HDFC Bank invests more in 2011, 2012 and 2013 butget highest return more than investment in 2018. ICICI Bank invests more but get less returnin 2011 and 2015 but get highest cash flow from investing activities in 2018. Kotak MahindraBank invests more in 2009, 2011, 2012, 2013 and 2018 and have highest cash flow from investing activities in 2017. Axis Bank invests more in 2012, 2015, 2016 and 2018 but have highest cash flow from investing activities in 2017.

TABLE 03
Cash Flow from Financing Activities of all selected Banks

(Rs. in Crore)

Year	SBI	BOB	PNB	CANARA	HDFC	ICICI	KOTAK MAHINDRA	AXIS
2011	2057.11	3177.96	-744.36	2600.78	1227.99	3105.97	1724.19	8769.69
2012	2147.66	165.35	633.84	-1554.93	3286.19	3829.95	4928.44	7272.37
2013	-3259.72	-790.27	873.11	-1744.57	9065.84	2989.72	3938.23	14774.60
2014	3811.17	5151.34	988.35	1079.44	5562.98	6838.37	-6161.84	5490.15
2015	-2289.12	-6.44	5954.72	140.19	14543.44	15005.67	-726.93	28846
2016	4505.88	-615.73	856.29	2331.36	6588.57	-585.07	-1463.91	18671.58
2017	-1780.27	-198.26	738.69	124.11	-11567.63	-30378.79	256.52	-4628.87
2018	4290.92	4078.65	7406.67	2864.86	48411.43	34118.30	9837.22	50400.78

INTERPRETATION
Table 4.1.3 demonstrates the cash flow from financing activities of selected public and privatesector banks. It is observed the SBI acquire more finance in 2011 but cash flow from financingactivities in 2011, 2013, 2015 and 2017 are negative which indicates they create more reservefunds in those years. BOB acquire more finance in 2014 but create more reserves in 2013, 2015and 2016. In case of IDBI more reserve funds are created in 2011, 2012 and 2015 but acquiremore finance in 2016.

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TABLE 04
Variations of Cash Flow from Operating Activities of allSelected Banks

(Rs. in Crore)

Year	SBI	BOB	PNB	CANARA	HDFC	ICICI	KOTAK MAHINDRA	AXIS
2011	34282.27	11778.8	8045.67	8527.35	-375.83	-6908.92	-1474.47	11425.07
2012	28468.58	14406.5	-811.22	-832.22	-11355.61	9683.82	-3922.92	-9826.93
2013	21661.23	22793.1	-1886.71	8542.65	-1868.78	11102.01	-1405.46	2719.04
2014	14107.42	41016.3	17729.1	9535.20	8363.60	4668.60	9001.63	16702.56
2015	27621.03	18021.0	5618.67	4547.09	-15862.27	-4824.49	5121.93	-12922.02
2016	11195.55	-9841.66	17615.3	6078.45	-3224.67	22428.47	6133.72	-15971.85
2017	11060.32	17193.8	12497.0	2316.15	23585.4	39222.81	14411.92	34192.28
2018	-85425.2	-61087.8	1011.69	-11503.83	26074.07	13303.65	-10274.92	-46693.30
S.D	41307.54	31547.67	18647.37	10310.23	15762.05	25383.68	55130.78	22077.31
Rank	**7**	**6**	**3**	**1**	**2**	**5**	**8**	**4**
COV	455.70	473.27	292.45	333.68	477.77	332.435	300.71	-2254.02
Rank	**6**	**7**	**2**	**5**	**8**	**4**	**3**	**1**

Comparison of average of standard deviation and coefficientof variance ofcash flow from operating activities of selected public and private sector banks

Public Sector banks	S.D	COV	Private Sector banks	S.D	COV
SBI	41307.54	455.70	**HDFC**	15762.05	477.77
BOB	31547.67	473.27	**ICICI**	25383.68	332.435
CANARA	10310.23	333.68	**KOTAK**	55130.78	300.71
PNB	18647.37	292.45	**AXIS**	22077.31	-2254.02
AVERAGE	21589.06	371.306	**AVERAGE**	25516.41	-327.429

INTERPRETATION

From the table 4.2.1, it is observed that the standard deviation of Canara is lower thanall otherselected public and private sector banks in operating activities. It means that cash flowfrom operations of Canara is more stable. It indicates the strong solvency position of Canara.

It is also observed that the coefficient of variance of Axis Bank is lower than all other selectedprivate and public sector banks in operating activities. It means that Axis Bank has more consistency in operating activities than all other banks.

It indicates the sound liquidity position in operations of bank. From table 4.2.2, it is also observed that the Average of standard deviation of selected public banks is lower than privatebanks in operating activities. It means that cash flow from operations of public sector bank ismore stable than private sector banks. It indicates the strong solvency position of public sectorbanks. Table 4.6 also observed that the average of coefficient of variance of selected private sector banks is lower than public sector banks in operating activities. It means that private sector banks have more consistency in operating activities than public sector banks. It indicatesthe sound liquidity position in operations of private sector banks.

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TABLE 05
Cash Flow from Financing Activities of all Selected Banks

(Rs. in Crore)

Year	SBI	BOB	PNB	CANARA	HDFC	ICICI	KOTAK MAHINDRA	AXIS
2011	2057.11	3177.96	-744.36	2600.78	1227.99	3105.97	1724.19	8769.69
2012	2147.66	165.35	633.84	-1554.93	3286.19	3829.95	4928.44	7272.37
2013	-3259.72	-790.27	873.11	-1744.57	9065.84	2989.72	3938.23	14774.60
2014	3811.17	5151.34	988.35	1079.44	5562.98	6838.37	-6161.84	5490.15
2015	-2289.12	-6.44	5954.72	140.19	14543.44	15005.67	-726.93	28846
2016	4505.88	-615.73	856.29	2331.36	6588.57	-585.07	-1463.91	18671.58
2017	-1780.27	-198.26	738.69	124.11	-11567.63	-30378.79	256.52	-4628.87
2018	4290.92	4078.65	7406.67	2864.86	48411.43	34118.30	9837.22	50400.78
S.D	3428.607	2112.757	2642.09	1748.142	15561.02	15822.38	4520.098	15936.86
Rank	**4**	**2**	**3**	**1**	**6**	**7**	**5**	**8**
COV	305.5435	171.401	146.843	404.8152	185.9534	417.1238	367.603	116.6743
Rank	**5**	**3**	**2**	**7**	**4**	**8**	**6**	**1**

Comparison of average of standard deviation and coefficientof variance offinancing activities of selected public and private sector banks

Public Sector banks	S.D	COV	Private Sector banks	S.D	COV
SBI	3428.607	305.5435	**HDFC**	15561.02	185.9534
BOB	2112.757	171.401	**ICICI**	15822.38	417.1238
CANARA	1748.142	404.8152	**KOTAK**	4520.098	367.603
PNB	2642.09	146.843	**AXIS**	15936.86	116.6743
AVERAGE	2771.231	241.138	**AVERAGE**	11388.33	249.9782

INTERPRETATION

From table 4.2.5, it is observed that standard deviation of Canara bank is lower than all other public and private sector banks in financing activities. It means that cash flow from financing activities of Canara bank is more stable. It indicates the strong solvency position of Canara bank. It is also observed that the coefficient of variance of Axis Bank is lower than all other selected private and public sector banks in financing activities. It means that Axis Bank has more consistency in financing activities than all other banks. It indicates the sound liquidity position in financing activities of bank.

From table 4.2.6, it is observed that the Average of standard deviation of selected public banksis lower than private banks in financing activities. It means that cash flow from financing activities of public sector bank is more stable than private sector banks. It indicates the strongsolvency position of public sector banks. From the table 4.12 it is also observed that the averageof coefficient of variance of selected public sector banks is lower than private sector banks in financing activities. It means that public sector banks have more consistency in financing activities than private sector banks.

FINDINGS, SUGGESTIONS.CONCLUSIONS

FINDINGS

- SBI give more loans than its deposits in 2018 which can be seen by negative balance incash flow from operating activities in 2018.
- BOB have more cash outflows in operations than its inflows in 2016 and 2018.
- Kotak Mahindra, Axis Bank and all has more cash outflows in operation than its inflowsin 2018.
- SBI and BOB invest more in 2018.
- Kotak Mahindra and Axis has more cash outflows in investment activities in 2018.
- Axis Bank has more consistency in operating activities than all other banks. It indicatesthe sound liquidity position in operations of bank.
- Cash flow from operations of public sector bank is more stable than private sectorbanks. It indicates the strong solvency position of public sector banks.
- Public sector banks have more consistency in operating activities than private sectorbanks. It indicates the sound liquidity position in operations of public sector banks.
- ICICI Bank has more consistency in investing activities than all other banks.

- Cash flow from investing activities of public sector bank is more stable than private sector banks.
- Public sector banks have more consistency in investing activities than private sector banks.
- Cash flow from financing activities of Canara bank is more stable. It indicates the strongsolvency position of Canara bank.
- Axis Bank has more consistency in cash flow from financing activities than all other banks.
- Cash flow from financing activities of public sector bank is more stable than private sector banks. It indicates the strong solvency position of public sector banks.
- Public sector banks have more consistency in financing activities than private sector banks.
- Cash flow from operating activities of Kotak Mahindra Bank is better than all other selected banks. It indicates the level of cash flow from operations of Kotak Mahindrabank is higher than all other Banks.
- Cash flow from operating activities of public sector banks is better than private sectorbanks. It indicates the level of cash flow from operations of public sector banks is higherthan selected private sector Banks.
- Cash flow from investing activities of public sector banks is better than private sectorbanks. It indicates the level of cash flow from investments of public sector banks is higher than selected private sector Banks.
- Cash flow from financing activities of Axis Bank is better than all other selected banks.

It indicates the level of cash flow from financing activities of Axis bank is higher thanall other Banks.

- Cash flow from financing activities of private sector banks is better than public sectorbanks. It indicates the level of cash flow from financing activities of private sector banks is higher than selected public sector Banks.

SUGGESTIONS

Based on the findings of the study here are some possible suggestions:

- For banks with negative cash flow from operating activities, such as SBI, the bank mayneed tore-evaluate its lending policies and loan portfolio to ensure that it can generatesufficient cash inflows from its operations.
- Banks that have more cash outflows than inflows in operations, such as BOB, may needto improve their operational efficiency to reduce costs and increase revenues.
- Private sector banks, such as Kotak Mahindra and Axis, may need to focus on improving theircash flow from operations and investing activities to ensure their long-term solvency position and financial stability.
- Public sector banks, such as SBI and Canara Bank, can leverage their consistent flow from operations and financing activities to support their lending activities and strengthen their liquidity position.
- Banks that have better consistency in their cash flows, such as Axis Bank, and ICICI Bank, canuse their strong financial position to pursue growth opportunities and expandtheir market share.
- Banks that have higher levels of cash flow from operations and investing activities, such as Kotak Mahindra Bank and public sector banks, may be better positioned to weather economicdownturns and market volatility

Overall, banks should carefully analyze their cash flow statements and identify areas for improvement in their lending, operational efficiency, and investment strategies to maintaintheir financial stability and long-term viability.

CONCLUSION

The findings of this study provide valuable insights into the financial performance ofselectedbanks in terms of their cash flow activities. The negative balance in cash flow from operating activities for SBI indicates a potential issue with their lending policies and loan portfolio. Similarly, BOB needs to improve its operational efficiency to reduce costs and increase revenues. Private sector banks, such as Kotak Mahindra and Axis, should focus on improvingtheir cash flow from operations and investing activities, while public sector banks,such as SBIand Canara Bank, can leverage their consistent flow from operations and financing activities to support their lending activities.

The study also highlights the importance of strong financial position and consistency in cash flows. Banks such as Axis Bank and ICICI Bank have shown consistency in their cashflows and can use their financial position to pursue growth opportunities and expand their market share. Banks with higher levels of cash flow from operations and investing activities,such as Kotak Mahindra Bank and public sector banks, may be better positioned to weather economicdownturns and market volatility.

In conclusion, banks need to carefully analyze their cash flow statements and identifyareas forimprovement in their lending, operational efficiency, and investment strategies to maintain their financial stability and long-term viability. The suggestions provided based on the study findings can serve as a starting point for banks to improve their financial performance and position themselves for future success.

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HEALTHY LIFESTYLE, ITS ESSENCE, CONTENT AND STRUCTURE

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ABSTRACT
This paper clarifies the concept of healthy lifestyle, its essence, content and structure. Furthermore, the factors that influences the healthy lifestyle, such as morning exercise, proper nutrition, abandoning bad habits are explained.
KEY WORDS: *lifestyle, protection, alcoholism, bad habits, shopaholicism*

A healthy lifestyle is a person's choice of living conditions in accordance with his health, that is, a high hygienic culture of individual social groups and society as a whole. Rules against habits that harm the body, correct hygienic conditions play an important role in increasing the body's protective ability.

It is known from the results of foreign research that a number of factors affect a person's healthy lifestyle, according to G.Hervas, physical activity and nutrition, alcohol, drugs, sleep mode [1], K According to Almutairi, it also depends on social environment and national, cultural conditions, religious status [2]. M. Campos commented on the influence of sociological and economic factors on healthy lifestyle [3], A. Virs on geographic location, sleeping and eating [4], and M. Schmidt on sexual activity [5]. Summarizing the opinions of scientists, we can conclude that a healthy lifestyle includes increasing the body's protective ability and immunity, engaging in various activities, rational nutrition, regular physical activity, exercise, maintaining personal hygiene, maintaining one's own health.

A healthy life is not compatible with unhealthy habits, that is, alcohol and other intoxicating substances, as well as smoking, prevent the formation of a healthy lifestyle. Harmful habits are a dangerous factor that causes many diseases and negatively affects the health of young people. The correct organization of physical activity is the main condition for the formation of a healthy lifestyle, it improves the functioning of body organs and organ systems, actively supports the growth and development of the body, increases the body's working capacity, resistance to various diseases. increases. As a result of inactivity, negative changes develop in the body.

A healthy lifestyle is a philosophical concept that deeply expresses the scope of material and aesthetic diversity of the real life activities of society, social groups, and individuals, and leads a person to a prosperous life. A healthy lifestyle is a form of life activity determined by individual characteristics and socio-cultural factors. A healthy lifestyle is a state of harmony with all levels, i.e. physical, mental, spiritual, as well as with the external environment, being [6].

A healthy lifestyle is a vital concept aimed at improving and maintaining health by following proper nutrition, regular physical education, following moral rules and giving up bad habits. The issue of what components a healthy lifestyle, which is considered an integral part of everyday life, includes has caused many discussions among world scientists. Some consider it abstinence from alcohol, tobacco, and drugs, while others emphasize the importance of physical activity.

In particular, according to L.Hadad, R.Maitah, S.Cameron, M.Armstrong, the improvement of physical activity, proper nutrition, spiritual growth, interpersonal relationships and stress resistance are responsible for health [7]. At this point, it should be noted that the uncontrolled consumption of alcohol, the expansion of sales and advertising of alcoholic products, social, economic and psychological tensions in society, lack of alternative organization of free time and rest time have affected the population, including , causing young people to go out of their way to drink. "Risk factors" are associated with disease and death, so its study and assessment are important for both psychology and medicine [8]. However, based on the results of many studies, it should be recognized that today the representatives of the medical field cannot solve the health problem on their own without turning to pedagogues and psychologists. The health problems of the medical workers themselves are increasing year by year [9].

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Alcoholism, as the antipode of a healthy lifestyle, is a huge social evil that causes premature death, “destroys” a person from the inside, and causes great harm to society. Many scientists and society of the country consider the abuse of alcohol as a “national disaster”, “collective suicide of the nation”, “the road leading to the catastrophe of humanity”. German scientist Y.Reim explains the emergence of infectious diseases, cancer, diabetes, neuropsychiatric diseases, conscious or unconscious self-harm as a result of alcoholism [10]. The beginning of systemic intoxication in alcoholism is a lack of courage, strength and will, which occurs during the period of mental dependence on alcohol.

Another of the most common harmful habits is smoking, and there is no organ or system in the human body that is not affected by cigarette smoke.

The central nervous system of a smoker is under constant stress due to the stimulating effect of nicotine. But at the same time, blood flows to it less (due to the spasm of cerebral vessels) and the amount of oxygen necessary for the active functioning of the brain decreases. It is difficult for the brain cells to process the oxygen given to the brain, so the mental capacity of the smoker decreases, the memory weakens and the will power decreases. In addition, a smoker is often restless, has trouble sleeping, and suffers from headaches.

Drug addiction is manifested in the process of using various means to achieve an intoxicating effect, compared to alcoholism and smoking, the following features are noticeable:

- young people often fall into the trap of drug addiction, so medical and social consequences, especially life expectancy, are reduced;
- addiction develops very quickly;
- the risk of diseases such as HIV infection, viral hepatitis B and C increases dramatically;
- the degradation of the person develops in a short time;
- the impact on health is more serious and irreversible;
- it is more difficult to give up.

Taking into account the above, it is appropriate to analyze the component structure of this concept in addition to abstaining from drugs, smoking and alcoholism in order to develop a healthy lifestyle. In particular, the following should be mentioned as components of a healthy lifestyle:

1. **Morning exercise** helps the body wake up from sleep, improves metabolism and strengthens the immune system. A person can adequately respond to external physical and mental stimuli, as a result of which stress is reduced, vision improves, and thinking becomes clearer. Sports exercises have a positive effect on the body and improve health. Regular sports training provides muscle strength, increases endurance, energy and mobility, as well as helps to increase immunity and harmonious functioning of the musculoskeletal and cardiovascular systems, and also reduces the risk of obesity due to sports. Playing sports makes a person disciplined, increases responsibility and contributes to an active lifestyle.
2. **Proper nutrition**. A balanced diet strengthens the immune system, normalizes metabolism, improves memory and appearance. Many people start eating right to achieve certain results, but unfortunately, they do not turn this process into a lifestyle. According to the experience of D. Park, K. Choi, K. Han [11], the formation of bad eating habits among students is a factor that has a serious negative impact on their health. Such unhealthy eating habits lead to two different outcomes, the first is the risk of malnutrition (anemia) and the second is the risk of obesity.
3. **Exercise**. Exercise strengthens the nervous system, normalizes blood pressure, metabolism, has a good effect on heart activity and blood vessels. Its main preventive value is that it does not cure the disease, but prevents its occurrence. In addition, it is suitable for any healthy person, regardless of age and level of physical development.
4. **Healthy sleep.** Healthy sleep is one of the most effective ways to maintain health, strengthen the immune system and prevent many diseases. 7-8 hours of sleep a day increases productivity, but not everyone sleeps enough. Lack of sleep causes stress throughout the body with serious consequences. It affects heart rate increase, blood pressure increase, loss of appetite, indigestion, decrease in the ability to rationally and correctly respond to events. As a result of constant lack of sleep, the protective functions of the body are weakened. As a result, the ability to react to external factors slows down, productivity decreases, susceptibility to colds and viruses increases. People who sleep little or poorly often suffer from gastritis, stomach ulcers and hypertension.
5. **Giving up bad habits**. Bad habits: smoking, alcoholism, gambling addiction, drug addiction, overeating, shopping mania (shopaholicism), Internet addiction; TV addiction; nail biting; the habit of gnawing on things while writing; technomania; use of vulgar, rude words; such as negative thinking. By abandoning them, we can significantly improve our lives, change our outlook and thinking.

These simple rules are the basis of a healthy lifestyle. If a person is healthy and full of energy, travels, does extreme sports, tries new things, the door to a full and happy life is open for him.

Taking into account that a healthy lifestyle is closely related to proper nutrition, the daily diet of students should fully satisfy the needs of their growing organism for necessary nutrients and energy and fully compensate for the energy expended during the day. should be restored. In this regard, it is very important for students to know about basic healthy eating habits. Healthy nutrition means paying attention to providing all the body's needs for proteins, fats, carbohydrates, vitamins and many other nutrients, taking into account the useful properties of these products.

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ANALYZING CUSTOMERS' PERCEPTION ON GI TEXTILE PRODUCTS OF INDIA: PROTECTING THE ECONOMY FROM ITS SPACE

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ABSTRACT
Geographical Identification (GI) refers to the product origin of the particular place. It indicates the quality and feature of the place of production. It also involves the specific standard which helps to maintain the same standard of the product. This study analyzed the awareness and satisfaction factors of GI products mainly on the textile GI tagged products. The simple random sampling techniques have been adopted for the study. Both primary and secondary data have been used in this study. For the purpose of primary data 25 respondents were selected and well-framed questionnaire were distributed and collected from the respondents under survey method. Such collected data analyzed using SPSS software by doing the percentage analysis, ANOVA and mean ranking test. By doing the analysis, the study concluded that more awareness has to be created among people about the availability of different brands and the price can be little bit reduced where the sarees and fabrics will be reaced all the class of people.
KEYWORDS: *Geographical Identification (GI), Small-scale producers, Textile, Awareness and Satisfaction.*

INTRODUCTION
Geographical Identification (GI) is the key aspect which develops the specific economy with its benefit of products. It represents the origin and good qualities of the economy. The GI representation is on different factors such as agriculture, handicrafts, machinery, sweets and more. It eliminates the unauthorized channel and also helps the holder of the products to gain profit by using simple techniques without much investment. This shows the standards of such GI products which denote its own specificity of the place. The tags will be offered for the products called GI tags which registered under Register and protection Act 1999. This registration act will come under Industry promotion and international trade. Such registration prevents the third-parties involvement by the way of providing the indication for the product and also help to apply standards by maintaining its quality without any deviation.

Due to the development of small scale producers, it araises the need of making a study on knowing the awareness, satisfaction and problems faced by the customers on using the GI tagged products.

STATEMENT OF THE PROBLEM
In India, small scale producers and traders benefitted by these GI products in the case of improving the sales and profit. Such GI tagged products are having high demand because of its specialty on the basis of different variables such as quality, taste, features and others. As small scale manufacturers and producers are trying to indulged on gaining good profit circulating the awareness among the common public is a crucial one to be maintained. Since the GI tag has been offered to all variety of products, the development can be attained in all facts such as agriculture, handicrafts which might help many families to survive in the economy.

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SCOPE OF THE STUDY

This study mainly focuses on the distribution and awareness on GI products which are avail in overall India. While studying the such awareness and preferences, the growth of manufacturers and traders will be suggested to improve their own business. In addition, the registration and Protection Act 1999 of GI products will help to exhibit the strength of the country. It also help to have further study on analyzing the growth of agriculture and textile in a particular economy.

OBJECTIVES OF THE STUDY

1. To analyse the awareness level of GI Textile products among the people of Coimbatore City
2. The know the satisfaction on the usages of the GI Textile products.

RESEARCH METHODOLOGY

Sampling Design

The study has adopted the **descriptive sampling design.**

Sampling Area

The structured questionnaire has been framed and collected among the respondents of **Coimbatore city of Tamil Nadu** since the survey method has been adopted,**.**

Sampling Technique

In this study **Simple random sampling** has been adopted by collecting the questionnaire from the different respondents in Coimbatore city.

Sampling Size

This study constituted 25 respondents for the purpose of primary data collection. Since the Simple random sampling has been adopted, the questionnaires have been collected from different respondents of Coimbatore city.

Sampling Research Tools

The tools chosen for this analysis are

1. Percentage Analysis
2. Anova
3. Mean Ranking

REVIEW OF LITERATURE

Tregear, Torok and Gorton (2016), made an attempt on knowing the extent to which geographical indication in improving the position of small-scale producers. It is a secondary data study which examines numerous case studies which upgrading potentials of GIs for all agricultural producers. This study analyzed the higher margins of existing products, collective action and diversification of new agri-products. Finally, this study concluded that using current value chains and also the alternative chains help to find the relationship of best options to have an effective production and distribution of GI agri products.

Vecchio et al (2020) made a case study which aimed at boosting the agri-food local supply chain and rural economic development. This case study has been carried out to clarify the GI setting by focusing on various dimensions and circle. The context level of analysis made on the basis of both quantitative and qualitative data. Questionnaires and Interviews were administered in the study area to get the virtuous circle. This analysis confirmed the potentialities of the shea butter of GI which is a crucial one on the development of local rural communities.

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ANALYSIS AND INTERPRETATION

Level of Awareness on GI Products

GI Textile Products	Very High Awareness	High Awareness	Moderate Awareness	Low Awareness	Very Low Awareness	Total
Paithani Saree & Fabrics	4 (16%)	6 (24%)	12 (48%)	1 (4%)	2 (8%)	**25 (100%)**
Chanderi sarees	1 (4%)	10 (40%)	9 (36%)	2 (8%)	3 (12%)	**25 (100%)**
Muga Silks	1 (4%)	4 (16%)	6 (24%)	13 (52%)	1 (4%)	**25 (100%)**
Mysore Silk	9 (36%)	7 (28%)	5 (20%)	2 (8%)	2 (8%)	**25 (100%)**
Likal Sarees	2 (8%)	2 (8%)	4 (16%)	12 (48%)	5 (20%)	**25 (100%)**
Udupi Saree	4 (16%)	10 (40%)	5 (20%)	4 (16%)	2 (8%)	**25 (100%)**
Arani Silk	5 (20%)	10 (40%)	4 (16%)	3 (12%)	3 (12%)	**25 (100%)**
Kancheepuram Silk	16 (64%)	4 (16%)	2 (8%)	1 (4%)	2 (8%)	**25 (100%)**
Banaras Brocades and Sarees	12 (48%)	9 (36%)	2 (8%)	1 (4%)	1 (4%)	**25 (100%)**
Gadwal Sarees	2 (8%)	2 (8%)	1 (4%)	12 (48%)	8 (38%)	**25 (100%)**
Bomkai Saree & Fabrics	1 (4%)	1 (4%)	6 (24%)	8 (32%)	9 (36%)	**25 (100%)**

The above table shows that 64% of the respondents are very highly aware about the Kancheepuram silk, 40% of the respondents are highly aware of Chandeeri, Udupi and Arani silk sarees, 48% of respondents are moderately aware on Paithani sarees & fabrics, Likal and Gadwal sarees are having low awareness level of 48% and Gaswal sarres is having very low awareness of 38%.

Satisfaction Level towards GI Products

Factors	Highly Satisfied	Satisfied	Neutral	Dis- Satisfied	Highly Dis-Satisfied	TOTAL
Price	1 (4%)	6 (24%)	13 (52%)	2 (8%)	3 (12%)	**25 (100%)**
Availability	12 (48%)	10 (40%)	1 (4%)	1 (4%)	1 (4%)	**25 (100%)**
Quality	11 (44%)	7 (28%)	5 (20%)	1 (4%)	1 (4%)	**25 (100%)**
Designs	7 (28%)	9 (36%)	5 (20%)	2 (8%)	2 (8%)	**25 (100%)**
Aesthetic	13 (52%)	3 (12%)	6 (24%)	3 (12%)	1 (4%)	**25 (100%)**
Comfortability	13 (52%)	4 (16%)	3 (12%)	2 (8%)	2 (8%)	**25 (100%)**
Durability	7 (28%)	12 (48%)	1 (4%)	2 (8%)	3 (12%)	**25 (100%)**

The above table gave a clear view that 52% of respondents are highly satisfied with the features like Aesthetic and comfortability, 48% of respondents are satisfied due to the factor Durability, 52% of respondents felt that the price are neutral, 12% of respondents are not satisfied due to the aesthetics sense of GI products, price and durability of products are not at all satisfied on GI products.

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Satisfaction Factors of GI Products and Age

ANOVA						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Price	Between Groups	3.600	3	1.200	1.235	.322
	Within Groups	20.400	21	.971		
	Total	24.000	24			
Availability	Between Groups	.960	3	.320	.285	.836
	Within Groups	23.600	21	1.124		
	Total	24.560	24			
Quality	Between Groups	.240	3	.080	.069	.976
	Within Groups	24.400	21	1.162		
	Total	24.640	24			
Designs	Between Groups	1.707	3	.569	.354	.787
	Within Groups	33.733	21	1.606		
	Total	35.440	24			
Aesthetic	Between Groups	2.800	3	.933	1.021	.403
	Within Groups	19.200	21	.914		
	Total	22.000	24			
Comfortability	Between Groups	5.040	3	1.680	.865	.475
	Within Groups	40.800	21	1.943		
	Total	45.840	24			
Durability	Between Groups	16.640	3	5.547	4.774	.011
	Within Groups	24.400	21	1.162		
	Total	41.040	24			

The above table One way ANOVA results shows that the p-value is 0.322 (Price), 0.836 (Availability), 0.976 (Quality), 0.787 (Designs), 0.403 (Aesthetics) and 0.475 (Comfortability) are higher than the significant level 0.05. Therefore, it is inferred that there is no significant difference between satisfactional factors of GI Products and age, hence the hypothesis is accepted.

It is also found that the 0.011 (Durability) is less than the significant level 0.05.Therefore, there exists a significant difference between satisfactional factors of GI Products and age, hence the hypothesis is rejected.

Mean Ranking on Satisfaction factors

S.No	Reasons	Mean Rank	Actual Rank
1.	Price	4.36	I
2.	Availability	5.07	IV
3.	Quality	4.98	III
4.	Design	5.25	VI
5.	Aesthetic	4.92	II
6.	Comfortability	5.28	VII
7.	Durability	5.15	V

The above table inferred that from the above satisfaction factors Price ranked I with the mean rank of 4.36.

SUGGESTIONS

- More and more awareness should be created with the speciality of products.
- Marketing and sales promotion related to the usages and benefits can be made to increase the awareness of different brands.
- Aesthetic sense related to tradition and culture can be focussed.
- Cost of the products can be reduced to some extent.

- Designs of sarees can be improved to focus on quality.

CONCLUSION

Since GI products are the indications of the economy. It is very important to focus on its rapid growth and development. Since GI tags have been offered on different products, especially textile plays a key role on specifying the specialty of the saree and fabric materials. While taking the textile into consideration all small weavers re getting benefitted just by getting into the registration and protection Act. This helps the small producers and investors for best survival by eliminating intermediaries which might lead to losing of money. In addition, the GI products under tagging help to maintain tradition of the particular place.

"Be Aesthetic by Upgrading the Trend"

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EFFECTIVENESS OF MANGOSTEEN PEEL METHANOL EXTRACT AS ANALGESIC AND ANTIPYRETIC IN WISTAR RATS

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ABSTRACT
Inappropriate use of analgesics, because these drugs are over-the-counter drugs, can negatively impact the body. A plant that has potential as an antipyretic analgesic compound is mangosteen fruit. Many studies have explored the multiple benefits of natural ingredients, including mangosteen peel. The study aims to test the analgesic and antipyretic effectiveness of mangosteen skin methanol extract in Wistar rats. This study is an experimental research, with a post-test-only Only Control Group Design design that aims to explore mangosteen peel's antipyretic and analgesic effects in March 2023. Analyzed with IBM SPSS 25 software, data normality test using Shapiro-Wilk. If the data is usually distributed, parametric statistical analysis is carried out in one-way ANOVA, while if the data is not normally distributed, data transformation is carried out. However, if the data is still abnormally distributed, an alternative test is carried out with non-parametric statistical analysis in the form of Kruskal-Wallis. The mangosteen peel methanol extract results contain various phytochemicals, namely Alkaloids, Saponins, Flavonoids, Tannins, and Steroids and Terpenoids. Conclusion Methanol extract from mangosteen skin has a significant antipyretic effect (P value = 0.014) after 5 hours of administration with an optimal dose of 600 mg/kg body weight. Mangosteen skin methanol extract has a significant analgesic effect (P value = 0.042) on nociceptive pain with an optimal dose of 600 mg/kg body weight.
KEYWORDS: *analgesic, antipyretic, mangosteen peel*

INTRODUCTION

Medicine today requires an industry that produces pharmaceutical drugs, most of which are based on plant-active principles. Most areas of the world continue to use traditional medicine based on the direct use of medicinal plants due to its low cost (1). Analgesic-antipyretic is a compound used by humans of all ages to reduce pain and fever for various reasons. Analgetics are compounds that can reduce or eliminate pain without removing consciousness. At the same time, antipyretics can reduce fever (high body temperature). Plants that can have potential antipyretic analgetic compounds are mangosteen fruit (Garcinia mangostana L) (2).

Many studies have explored the various benefits of natural ingredients, including mangosteen peel. Methanol extract of mangosteen (Garcinia mangostana L.) peel contains saponins, alkaloids, flavonoids, triterpenoids, tannins, and polyphenols (3). Therefore, mangosteen peels have various pharmacological effects such as anti-inflammatory, antioxidant, antidiabetic, and antibacterial (4-7). Flavonoids in mangosteen peel can inhibit prostaglandins and thus have antipyretic effects (8).

Inappropriate use of analgesics because this over-the-counter drug can lead to various adverse effects on the body. Its misuse is common in professional circles for recreational sports use, to reduce pain due to athletic activity, or as a precaution before training (9). The wide use of paracetamol is due to the analgesic-antipyretic effect of this compound is entirely rational with a lower potential risk of interaction with other compounds at standard doses (10); (11). Dorji et al. (2018) reported that out of 441 outpatients, 72.1% of patients at Phuentsholing General Hospital used paracetamol in the past year (12). Surya et al. (2018) said that out of 50 parents of students at Laksana Kumara Kindergarten as a sample, it was found that 34 people (68%) tended to choose paracetamol as a choice of medicine for fever (13).

Paracetamol has adverse effects, including metabolites of paracetamol that are toxic. Paracetamol-induced liver failure has recently been reported as the second most common cause of liver transplantation in the United States (14). One of the natural ingredients that has the potential to serve as an alternative substitute is mangosteen rind. The utilization of mangosteen rind for medicine in Indonesia is still not much, especially as an antipyretic analgesic. The study aims to test the analgesic and antipyretic effectiveness of mangosteen peel methanol extract in Wistar rats.

RESEARCH METHODS

This study is an experimental study with a post-test-only Only Control Group Design research design to explore mangosteen peel's antipyretic and analgesic effects in March 2023. Tools are EDTA tube, five cc syringe, three cc syringe, one cc syringe, digital thermometer, 100 ml volumetric flask, 10 ml volumetric flask, filter paper, meaning paper, analytical balance, blender, macerator vessel, rotary evaporator, test tube, improved Neubauer counting chamber, and thermometer. Materials are methanol, Brewer yeast, Normal Saline, chloroform, NA-CMC, Paracetamol, Mangosteen Peel, Glacial acetic acid, distilled water, $FeCl3$, HCl, amyl alcohol, Sulfuric acid, magnesium powder, zinc powder, ammonia.

The acetic acid writhing test evaluated the analgesic activity of mangosteen peel extract. This method requires a 0.7% acetic acid solution made using 0.7 ml of 100% glacial acetic acid dissolved in 100 ml of distilled water using a 100 ml volumetric flask. The preparation of this solution is done by first entering 20 ml of aquadest, followed by 0.7 ml of 100% glacial acetic acid solution into a 100 ml volumetric flask, after which aquadest is added to the limit mark in a 100 ml volumetric flask.

Evaluation of the analgesic activity of this study was carried out using 25 rats grouped into five different groups:

a. Control: Rats in this group were given 1 ml of 0.5% Na-CMC and, after 15 minutes, were injected 10 ml/kgBB of 0.7% acetic acid solution. After 5 minutes of injection, the number of writhing was counted in rats for 20 minutes.
b. Standard (150 mg/kg body weight): Rats in this group were given an oral suspension of paracetamol 10 ml / kgBB. After 15 minutes, we were given an injection of 10 ml / kgBB of 0.7% acetic acid solution. After 5 minutes of injection, the number of writhing was counted in rats for 20 minutes.
c. Mangosteen Peel Extract-1 (200 mg/kg body weight): Rats in this group were given an oral suspension of mangosteen peel at a dose of 2.5 ml/kgBB and, after 15 minutes, were injected with 10 ml/kgBB of 0.7% acetic acid solution. After 5 minutes of injection, the number of writhing was counted in rats for 20 minutes.
d. Mangosteen Peel Extract-2 (400 mg/kg body weight): Rats in this group were given an oral suspension of mangosteen peel at a dose of 5 ml/kgBB and, after 15 minutes, were given an injection of 10 ml/kgBB of 0.7% acetic acid solution. After 5 minutes of injection, the number of writhing was counted in rats for 20 minutes.
e. Mangosteen Peel Extract-3 (600 mg/kg body weight): Rats in this group were given an oral suspension of mangosteen peel at a dose of 7.5 ml/kgBB and, after 15 minutes, were given an injection of 10 ml/kgBB of 0.7% acetic acid solution. After 5 minutes of injection, the number of writhing was counted in rats for 20 minutes.

The parameter measured to assess the analgesic activity of the sample is the number of writhing after 5 minutes of injection of 0.7% acetic acid solution for 20 minutes. In addition, the average inhibition of abdominal writhing can also be calculated by dividing the difference between the average number of writhing in the control group and the tested sample group by the average number of writhing in the control group multiplied by 100% (15).

Antipyretic activity testing in this study was carried out by the Yeast-Induced method. Brewer's Yeast solution was made from a 15% brewer yeast suspension form. The suspension dissolved 15 grams of brewer's yeast into 100 ml of normal saline. Then, 20 grams of the rest was dissolved with 100 ml of distilled water to make a 20% brewer's yeast solution. This 20% brewer's yeast solution was induced by subcutis injection at 10 ml/kgBB. Before and 24 hours after induction, the rats' body temperature was measured rectally with a digital thermometer (15-17).

Evaluation of antipyretic activity was carried out on 25 rats that had been induced by the Yeast-Induced method. The rats were then grouped into five groups, namely:

a. Control: Test animals were given 1 ml of 0.5% Na CMC suspension after 24 hours of induction. Food and drink were provided ad libitum.
b. Standard (150 mg/kg body weight): Test animals were given an oral suspension of paracetamol 10 ml/ kgBB after 24 hours of induction. Food and drink were provided ad libitum.
c. Mangosteen Peel Extract-1 (200 mg/kg body weight): Test animals were given 2.5 ml/ kgBB of mangosteen peel extract after 24 hours of induction. Food and drink were provided ad libitum.
d. Mangosteen Peel Extract-2 (400 mg/kg body weight): Test animals were given a 5 ml/ kgBB of mangosteen peel extract after 24 hours of induction. Food and drink were provided ad libitum.
e. Mangosteen Peel Extract-3 (600 mg/kg body weight): Test animals were given 7.5 ml/ kgBB of mangosteen peel extract after 24 hours of induction. Food and drink were provided ad libitum.

The parameter measured in this study is the body temperature of rats measured by rectal body temperature measurement. The average percentage of decrease in body temperature of rats can be calculated by dividing the difference between the average body temperature of rats 24 hours after induction and the average body temperature at a specific time after administration of the tested

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sample to the average body temperature of rats 24 hours after installation and multiplied by 100%. Analyzed with IBM SPSS 25 software, data normality test using Shapiro-Wilk. If the data were normally distributed, parametric statistical analysis was carried out in one-way ANOVA, while if the data were not normally distributed, data transformation was carried out. However, if the data is still not normally distributed, an alternative test is carried out with non-parametric statistical analysis in the form of Kruskal-Wallis.

RESEARCH RESULTS AND DISCUSSION

Table 1. Phytochemical Screening Results of Methanolic Extract of Mangosteen Peels

Phytochemical	Reagent	Result
Alkaloids	Bouchardart	+
	Mayer	+
	Dragondroff	-
	Wagner	+
Saponins	Aquadest + Alcohol 96%	-
Flavonoids	FeCl3 5%	+
	$Mg_{(s)} + HCl_{(p)}$	-
	NaOH 10%	-
	$H_2SO_{4\ (p)}$	-
Tanins	$FeCl_3$ 1%	+
Steroids and Terpenoids	Salkowsky	-
	Liberman Bouchard	+

From the data table above, it can be seen that mangosteen peel methanol extract contains several phytochemical compounds including Alkaloids, Saponins, Flavonoids, Tannins, and Steroids and Terpenoids.

Table 2. Comparison of Initial Body Weight of Mice in All Treatment Groups

Treatment Group	Body Weight (grams)	P-value
Control	176.13 ± 22.18	
Standard	172.23 ± 24.22	
Mangosteen Peel Methanol Extract -I	174.23 ± 23.62	0.738
Mangosteen Peel Methanol Extract -II	171.18 ± 20.13	
Methanol Extract of Mangosteen Peel -III	175.42 ± 20.34	

From the data table above, it can be seen that the P value> 0.05 (P value = 0.738) means that there is no significant difference in the initial body weight of the rats used in this study. The range of body weight of rats used in this study ranged from 145-192 grams which were evenly distributed in each treatment group.

Table 3. Comparison of Body Temperature in All Treatment Groups

Kelompok Perlakuan	Body Temperature (ºC)						
	Before Induction*	After Induction**	1 Hour**	2 Hour*	3 Hour*	4 Hour*	5 Hour*
Control	36.30 ± 0.37	38.11 (0.40)	37.75 (1.40)	37.72 ± 0.61	37.62 ± 0.46	37.36 ± 0.63	37.05 ± 0.45[a]
Standard	36.32 ± 0.27	38.00 (0.50)	37.60 (1.40)	37.46 ± 0.49	37.20 ± 0.26	37.02 ± 0.46	36.72 ± 0.22[ab]
Mangosteen Peel Methanol Extract -I	36.18 ± 0.31	38.40 (0.50)	38.30 (0.90)	37.64 ± 0.42	37.34 ± 0.38	37.24 ± 0.30	36.90 ± 0.32[a]
Mangosteen Peel Methanol Extract -II	36.34 ± 0.21	37.80 (0.40)	37.60 (0.80)	37.48 ± 0.61	37.00 ± 0.28	36.84 ± 0.23	36.60 ± 0.24[ab]
Methanol Extract of Mangosteen Peel -III	36.20 ± 0.19	38.00 (1.20)	38.10 (1.20)	37.58 ± 0.36	37.36 ± 0.46	36.86 ± 0.36	36.05± 0.14[b]
P-value	**0.886**	**0.623**	**0.281**	**0.917**	**0.104**	**0.167**	**0.014**

The data table above shows that the body temperature of all rats at the time before induction is uniform; this is reflected in the P value> 0.05 (P value = 0.886). After 24 hours of installation, the rats' body temperature also remained uniform; this can be seen

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from the P value> 0.05 (P value = 0.623). However, rats' body temperature after induction tends to increase compared to before. Before installation, rats' body temperature was 36.24-36.34oC and rose to 37.60-38.40oC after 24 hours of building.

After 24 hours of induction, all groups of rats were given treatment according to their treatment groups. The body temperature of rats 1-4 hours after treatment did not show significant differences between treatment groups. This can be seen from the P value of the rat's body temperature every hour, which is more critical than 0.05. However, at the end of the observation, namely, 5 hours after treatment, the rats' body temperature experienced significant changes; this was reflected in the P value <0.05 (P value = 0.014). , The mangosteen skin methanol extract group III showed the lowest body temperature 5 hours after treatment, which was 36.05 ± 0.14oC, and the mangosteen skin methanol extract group -III also showed a significant difference to the control group, which showed the highest body temperature, which was 37.75 ± 0.46oC.

In addition to the analgesic and antipyretic parameters previously described. This study also evaluated hematological parameters to support the antipyretic and analgesic parameters of mangosteen peel. The hematological parameters evaluated in this study include: Hemoglobin, erythrocyte count, leukocytes, and platelets. Before further analysis of the hematological parameters, data normality analysis with shapiro-wilk was conducted and the results of the analysis can be seen in the table 5.

Table 4. Comparison of the Number of Writhing in All Treatment Groups

Treatment Group	Number of Wriggles	P-value
Control	10.24 ± 2.31^{a}	
Standard	8.82 ± 3.26^{ab}	
Mangosteen Peel Methanol Extract -I	9.25 ± 2.42^{a}	0.008
Mangosteen Peel Methanol Extract -II	8.83 ± 3.36^{ab}	
Methanol Extract of Mangosteen Peel -III	4.16 ± 1.24^{b}	

Table 5. Comparison of Hematology Parameters in All Treatment Groups

Treatment Group	Hematologic			
	Hb* (gr/dL)	RBC** (x 10^6/µL)	WBC* (x 10^3/µL)	PLT* (x 10^3/µL)
Control	14.65 ± 4.12	7.69 (6.35)	7.71 ± 1.23^{a}	867.60 ± 214.14
Standard	14.01 ± 1.78	7.67 (2.95)	3.14 ± 1.01^{b}	650.62 ± 366.56
Mangosteen Peel Methanol Extract -I	12.44 ± 1.56	7.25 (2.60)	6.45 ± 0.56^{a}	800.61 ± 97.55
Mangosteen Peel Methanol Extract -II	14.08 ± 3.10	7.23 (5.20)	$5.09 \pm 0.1\,7^{c}$	867.40 ± 423.06
Methanol Extract of Mangosteen Peel -III	12.45 ± 0.65	7.15 (0.98)	3.21 ± 1.02^{b}	624.65 ± 242.11
P-value	**0.624**	**0.476**	**0.042**	**0.523**

The data table above shows that neither hemoglobin levels, erythrocyte counts, nor platelet counts showed significant differences between treatment groups. The range of hemoglobin, erythrocyte, and platelet counts in all groups of rats were 12.44-14.08 gr/dL, 7.15-7.69 x 106/µL, and 624.65-867.40 x 103/µL, respectively. Only the number of leukocytes showed a significant difference between treatment groups; the value of P < 0.05 reflected this. The standard group (3.14 ± 1.01 x 106/µL) and mangosteen peel methanol extract-III (3.21 ± 1.02 x 106/µL) showed significant differences with other treatment groups. The group with the highest leukocyte count was the control group, followed by the mangosteen peel methanol extract-I, II, III, and Standard groups. However, in the mangosteen peel methanol extract-I group (6.45 ± 0.56 x 106/µL) and the control group (7.71 ± 1.23 x 106/µL), there was no significant difference in the number of leukocytes.

The results of this study indicate that mangosteen peel has potential antipyretic and analgesic effects. It is shown that mangosteen peel in the form of methanol extract obtained by maceration has an antipyretic effect after 5 hours of extract administration. The antipyretic effect was mainly observed at the two highest doses of 400 mg/kg body weight and 600 mg/kg body weight. However, the analgesic effect of mangosteen peel was found at the highest dose of 600 mg/kg body weight. Meanwhile, the results of the hematologic examination showed a significant decrease in line with the increase in the amount of methanol extract of mangosteen peel given. The hot plate method was performed to evaluate the analgesic effect of neurogenic pain, while intraperitoneal injection of acetic acid was performed to assess the analgesic effect of peripheral pain. (18,19)(20)

Fever is an increase in body temperature exhibited by various living things in response to the invasion of an infectious agent. Brewer yeast is a lipopolysaccharide (exogenous pyrogen), a component of gram-negative bacteria's cell wall. When pyrogens such as lipopolysaccharide (LPS) or brewer yeast enter the body, they damage the natural barrier. The brewer yeast then binds to an immunological protein called Lipopolysaccharide Binding Protein (LBP). This binding promotes the synthesis and release of various endogenous cytokines such as IL-1, IL-6, and TNFα. These endogenous cytokines easily cross the blood-brainblood-brain barrier and act on the preoptic/ anterior hypothalamus, thus activating the arachidonic acid pathway and synthesizing and releasing prostaglandin E2. PGE2 produced from the cyclooxygenase-2 path causes an increase in body temperature (21,22).

The antipyretic and analgesic effects of mangosteen peel are related to the phenol and flavonoid content present in mangosteen peel. Various studies have reported analgesic effects possessed by alkaloid, phenol, and flavonoid compounds. Flavonoids can inhibit the biosynthesis of prostaglandins involved in immunological responses and are end products of the cyclooxygenase and lipooxygenase pathways. In addition, flavonoids also affect protein kinase, one of the regulatory enzymes that can inhibit the inflammatory process. (21) Besides flavonoids, Gaichu et al. (2017) also reported that alkaloid compounds as phytochemical compounds inhibit the synthesis of prostaglandins, a poduct of the cyclooxygenase pathway. (23) It can be concluded that the analgesic and antipyretic effects of mangosteen peel are due to alkaloids, phenols, and flavonoids. These phytochemical compounds will inhibit prostaglandins' biosynthesis, thereby preventing the cascade of inflammation and ultimately producing analgesic and antipyretic effects.

Research by Ponggele (2013) conducted a study on the analgesic test of mangosteen peel, stating that mangosteen peel extract has an analgesic effect that begins to appear at minute 30 to minute 120, with the maximum effect seen at minute 90, with a concentration of 10% in Swiss mice (24). Puspitaningrum (2014) stated that the results of ethanol extract of mangosteen peel (Garcinia mangostana L) proved to have an antipyretic analgesic effect with an effective dose of 50 mg/kg body weight of rats (2).

CONCLUSION

The conclusions that can be drawn from this study are that the methanol extract of mangosteen skin contains various phytochemicals, namely Alkaloids, Saponins, Flavonoids, Tannins, Steroids, and Terpenoids. Methanol extract from mangosteen skin has a significant antipyretic effect (P value = 0.014) after 5 hours of administration with an optimal dose of 600 mg/kg body weight. Mangosteen skin methanol extract has a significant analgesic effect (P value = 0.042) on nociceptive pain with an optimal dose of 600 mg/kg body weight.

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EFFECTIVENESS TEST OF SECOND DEGREE BURN WOUND HEALING FROM ETHANOL EXTRACT OINTMENT OF ZANTHOXYLUM ACANTHOPODIUM DC. IN WISTAR RATS

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ABSTRACT
Terpenoid content in Zanthoxylum acanthopodium DC. Fruit has antioxidant and antimicrobial activities that are repellent and insect killer. Antioxidant and immunostimulant activities of Zanthoxylum acanthopodium DC. Fruit can increase the number of lymphocyte cells. This study aims to analyze the effectiveness of second-degree burn healing ointment of Zanthoxylum acanthopodium DC—fruit on Wistar rats.This research is an experimental pre-test control group design conducted in March 2023. The research samples were Zanthoxylum acanthopodium DC plants, and the experimental animal samples were 20 male white rats of the Wistar strain (Rattus norvegicus) divided into four treatment groups, each consisting of five rats. Statistical analysis was a One-Way ANOVA test followed by a post-hoc test. BeforeA, a descriptive analysis of wound contraction and epithelialization period was performed before further testing. If the data in this study is not normally distributed, then data transformation will be carried out so that the data is usually spread. The results of the burn wound healing effect possessed by Zanthoxylum acaOintmentum DC. both 20% and 30% ointment and nebacetin ointment as standard showed significant references. The wound contraction rate of 30% ointment was better than nebacetin ointment as the standard. In conclusion, both Zanthoxylum acanthopodium DC. Both 20% and 30% ointments and nebacetin ointment, as the bar, did not show significant differences in epithelial period parameters.
KEYWORDS: *Zanthoxylum acanthopodium DC, Burns, Wound Healing*

BACKGROUND

The Ministry of Health's 2013 Basic Health Research data noted that burns rank sixth cause of unintentional injury after falls, motorcycles, sharp/blunt objects, other land transportation, and falls with a prevalence rate of 0.7 percent of the Indonesian population. It also emphasized that children ages 1-4 are the most vulnerable age group to burns with a prevalence rate of up to 1.5 percent (1). Combustion is an injury (injury) as a result of direct contact or exposure to sources of heat (thermal), electricity, chemicals, or radiation (2). Wound healing that must be treated and healed immediately, several healing phases such as the inflammatory phase, proliferative phase, and maturation phase. The inflammatory phase is characterized by hemostasis, chemotaxis, and increased permeability of blood vessels that limit further damage, close wounds, remove cellular debris and bacteria and encourage cellular migration (3). Zanthoxylum acanthopodium DC. fruit extract is reported to have active physiological activity as a potential antioxidant and antimicrobial so the components that play a role in these unique properties need to be identified (4).

Some studies prove that the terpenoid content of Zanthoxylum acanthopodium DC. has antioxidant and antimicrobial activities that are repellent and insect killer (5). Antioxidant and immunostimulant activities of Zanthoxylum acanthopodium DC. fruit can increase the number of lymphocyte cells. They can reduce free radicals, but until now, there is still not much information related to the biological activity of Zanthoxylum acanthopodium DC. nano herbs, especially in increasing antioxidant and immunostimulant activities associated with preventing or accelerating the healing of burns on the skin. This study aims to analyze the effectiveness of second-degree burn wound healing ointment Zanthoxylum acanthopodium DC. in Wistar rats.

RESEARCH METHODS

This research is an experimental pre-test control group design. March 2023. The research sample was the Zanthoxylum acanthopodium DC plant, and the animal samples were 20 male Wistar rats (Rattus norvegicus) divided into four treatment groups, each comprising five rats. Independent variables include the administration of several topical formulations (base ointment, nebacetin® ointment, Zanthoxylum acanthopodium DC ointment. 20% and Zanthoxylum acanthopodium DC. 30% ointment), and the independent variables which include wound contraction and epithelialization period (7); (8). The statistics analysis used in the study was Anova's One-Way test, followed by a post-hoc test. Before another test is done descriptive analysis of wound contraction and epithelial period. If the data in this study is distributed abnormally, then there will be a transformation of the data so that the data is distributed normally.

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RESULTS AND DISCUSSIONS

Table 1.Wound Contraction Analysis Results (%) Data on Burn Healing Parameters.

	Wound Contraction (%)				
Observation Time	**Control**	**Standard**	**Saleb Zanthoxylum acanthopodium DC. 20%**	**Saleb Zanthoxylum acanthopodiu m DC. 30%**	**Nilai**
Day 3	4.78 (8.33)	0.01 (8.70)	14.54 (25.91)	10.62 (15.91)	0.002**
Day 6	9.43 ± 5.21	18.24 ± 10.54	32.16 ± 7.88	45.67 ± 7.58	0.002*
Day 9	7.51 ± 7.92	35.12 ± 8.05	45.45 ± 6.55	52.42 ± 8.92	0.002*
Day 12	9.51 (29.17)	53.56 (20.71)	64.64 (21.75)	56.67 (8.96)	0.005**
Day 14	23.2 (37.50)	86.71 (42.46)	76.27 (13.64)	89.29 (3.64)	0.002**

In addition to wound contraction, another parameter that is also evaluated in assessing burn healing is the epithelial period, the results of different tests from the epithelialization period of each treatment group can be seen in the table below.

Table 2.Results of Epithelial Period Comparison in Each Treatment Group

Treatment Group	Period Epitelialisasi*	Value P
Control	22 (2)[a]	
Standard Ointment Zanthoxylum DC. 20%	17 (2)[b]	0.014
Ointment Zanthoxylum DC. 30%	20 (2)[b] 20 (2)[b]	

* Data is presented in Median (Range). Different lowercase letters in the same column shows a significant difference in the value of $P < 0.05$

From the table data above it can be seen that there are significant differences in the epithelial period of the standard group, 20% and 30% in the control group. However, in the Zanthoxylum acanthopodium DC. ointment group and the standard group there was no difference in epithelial period. This is evident from the value $P < 0.05$ (Value $P = 0.014$). Based on the results of the above study, it can be seen that there are significant differences in the wound contraction parameters and epithelialization periods of each treatment group. The healing activity of the burn owned by the Zanthoxylum acanthopodium DC. fruit is related to the antioxidant, anti-inflammatory, and antimicrobial activity of this Zanthoxylum acanthopodium DC. fruit, because through the antioxidant and antimicrobial activity owned by this fruit it will create a good environment (Microenvironment) for wound healing.

Zanthoxylum acanthopodium DC. is a Rutaceae family that is widely found in North Sumatra, and the fruit is widely used as a traditional cooking spice by the Batak tribe (9). Some studies prove that the content of Zanthoxylum acanthopodium DC. terpenoids has antioxidant and antimicrobial activity, also has immunostimulating effects (9). Most plants that contain bioactive compounds such as glycosides, alkaloids, terpenoids, and flavonoids have antioxidant and antidiabetic activity (10). Burns can usually be prevented, and different treatments are applied based on the severity of the burn. Sometimes, ointments, creams, biological and nonbiological dressings, and antibiotics are recommended levels 2, 3, and 4 burns, while misuse of these drugs increases the risk of antibiotic resistance and fungal infections, even slowing wound healing and increasing the depth of burns (11). Alternative treatments for burns other than with pharmacology are honey, aloe vera, oatmeal, eggs, mud, leaves, or cow dung, which have been used for the treatment of burns (12); (13). The skin is part of the integument system and is considered the largest organ of the human body. There are three main layers of skin: epidermis, dermis, and hypodermis (subcutaneous fat). Skin appendages such as sweat glands, hair follicles, and sebaceous glands are in-depth reviewed elsewhere (14). This is supported by the results of research conducted by Winarti *et al.* (2018) who reported that ethyl acetate extract from Zanthoxylum acanthopodium DC. fruit has high antioxidant activity with ic50 value of 66.91 BPJ, antioxidant activity in ethyl acetate extract is due to the presence of compound 2-methoxy-4-vinylfenol (6).

CONCLUSION

The conclusions that can be drawn from this study are as follows, the healing effects of burns possessed by Zanthoxylum acanthopodium DC. ointments are both 20% and 30% and nebacetin ointment as standard shows significant differences. Where the wound contraction rate of your ointment is 30% better than nebacetin ointment as standard. But in both Zanthoxylum acanthopodium DC. ointments, both 20% and 30% and nebacetin ointment as standard showed no significant difference in the parameters of the epithelial period.

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IMPACT OF HOME BAKERIES ON SOCIAL MEDIA USERS – AN EMPIRICAL STUDY IN COIMBATORE CITY

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ABSTRACT
The bakery is one of the largest segments in India in the processed food category. The industry offers a lot of growth and business opportunities. The changing customer habits and lifestyle are making the traditional bakeries obsolete and given enormous growth to the home bakers. The demand for customized bakeries, healthy ingredients, choice of flavours makes the home bakers much more popular than any traditional bakery. In course of time baking started getting commercial, which used automated machines to produce for extensive distribution. Eventually to increase the shelf life of the product, the commercial bakers started adding food additives and preservatives to the baked goods. This is where the home baked products came into market. Establishing a home bakery needs only a minimal amount of investment and human resource which makes it easy for home bakers. As like any other business, home baking also needs proper strategy and marketing techniques to be on trend. Baked products play a vital role in our Indian food industry. Bakery products like cakes and breads are made easily available for consumers, even though they do not fall under the list of necessities. This bakery industry was already a crowded place before the pandemic period itself. Here, social media plays a vital role for home bakers to launch their products and market them.
KEY WORDS: *Bakery, social media, home bakery.*

INTRODUCTION
The consumption of bakery items is high in every household. Just look at the number of times you consume bread, biscuits, cookies, etc. in your day-to-day life. But as much as we like to consume these baked goodies, we also actively look for healthy alternatives of the same. And that's when the consumer turn towards a home baker. One of the key advantages of home baking is that it allows for a high degree of customization and personalization. Home bakers can cater to specific dietary requirements, such as gluten-free or vegan diet, and can also offer unique and creative flavour combinations that are not commonly found in traditional bakeries. In addition, home bakers often use high-quality, locally sourced ingredients, which can result in superior taste and texture.

OBJECTIVES OF STUDY
- To study the shift of consumer's demand from traditional bakeries to home bakeries.
- To find out the impact that homebakeries have created among social media users.
- To identify the experience of social media users by homebakeries.
- To analyze the consumer behavior of social media users.
- To assess the importance of home bakeries and the role of social media in its growth.

SCOPE OF THE STUDY
The popularity of home baking has been increased and this study confines that the home bakers upgrade their skills and knowledge often to adapt them to market trend. This study helps in observing the perception of social media users towards home bakeries. The study gives an insight about how home bakeries focus on various factors like price, quality and availability of products. This study focused on the performance of home bakeries in various social media platforms.

RESEARCH METHODOLOGY
The study undertaken was descriptive in nature as it provides description of the state of affairs, as it exists at present "Impact of home bakeries on social media users.

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SOURCES OF DATA

The information relevant for the study was drawn from secondary data, which alone was not sufficient. Primary data was collected through survey method using questionnaire to conduct the study successfully. A questionnaire was designed for this purpose.

TOOLS FOR ANALYSIS

- Simple percentage analysis
- Rank analysis
- Weighted average analysis
- Chi square test

REVIEW OF LITERATURE

A literature review is survey of scholary sources (such as books, journal articles, and theses) related to a specific topic or research question.

Lee o. upton, Emma j.broming and Dr.Rebecca l.upton(2012)[30] made a study on ,"Research on customers relationship entrepreneurs social networks". Entrepreneurs must leverage valuable resources, in order to increase the success throughout the entrepreneurial process. Popular usage and understanding of social networks have broadened in the past few years and many are familiar with the terms given rise of useful technologies.

ANALYSIS AND INTERPRETATION

SIMPLE PERCENTAGE ANALYSIS

Gender

Gender of the respondents

S. No.	Gender	Frequency	Percent
1	Male	75	44.1
2	Female	95	55.9
	Total	170	100.0

Sources: Primary data

Interpretation

The table shows the frequency and percentage distribution of the respondents by gender. Out of the total sample size of 170, 75 respondents (44.1%) were male, and 95 respondents (55.9%) were female. This indicates that the majority of the respondents were female.

Inference

It is concluded that majority (55.9%) of the respondents are female.

Monthly Income

Monthly income of the respondents

S. No.	Monthly income	Frequency	Percent
1	Less than 20000	45	26.5
2	Rs.20, 001-35,000.	71	41.8
3	Rs.35,001 - 50,000	19	11.2
4	Rs.50, 000 and above.	35	20.6
	Total	170	100.0

Source: Primary Data

Interpretation

There were a total of 170 individuals surveyed. 41.8% of the respondents earn between Rs.20, 001-35,000. The next largest group 26.5% earn less than Rs.20,000 per month. 20.6% of the respondents earn Rs.50,000 while only 11.2% of the respondents earn between Rs.35,001-50,000 per month.

Inference

It is concluded that majority (41.8%) of the respondents earn Rs. 20,001-35000 as monthly income.

Consumer preferences for baked goods shifted from traditional bakeries to home bakeries after the pandemic:

Shift of consumer preference

S. No.	Level of agreement	Frequency	Percent
1	Strongly agree	30	17.6
2	Agree	46	27.1
3	Neutral	54	31.8
4	Disagree	40	23.5
	Total	170	100.0

Source: Primary Data

Interpretation

Among 170 responses collected, 17.6% of the respondents agreed and 27.1% strongly agreed that consumer preferences for baked goods had shifted from traditional bakeries to home bakeries after the pandemic. In contrast, 23.5% of the respondents disagreed with the statement, and the majority, 31.8%, remained neutral.

Inference

Majority 31.8% of the respondents are neutral about shift of consumer preference for baked goods.

WEIGHTED AVERAGE ANALYSIS

Aspects of home bakeries that attracts consumers the most:

Factors about home bakeries

FACTORS	1	2	3	4	5	TOTAL	RANKS
Hygiene and Sanitation	**105 (525)**	**36 (144)**	**15 (45)**	**7 (14)**	**7 (7)**	**170 (735)**	**I**
Customization services	**18 (90)**	**98 (392)**	**35 (105)**	**10 (20)**	**9 (9)**	**170 (616)**	**IV**
Provides high end quality Products	**43 (215)**	**90 (360)**	**22 (66)**	**7 (14)**	**8 (8)**	**170 (663)**	**III**
Adapting to market trends	**20 (100)**	**45 (180)**	**72 (216)**	**15 (30)**	**18 (18)**	**170 (544)**	**V**
Attractive packaging	**88 (440)**	**31 (124)**	**36 (108)**	**5 (10)**	**10 (10)**	**170 (683)**	**II**

Source: Primary Data

Interpretation

- As ranked by 170 respondents, the aspect Hygiene and Sanitation is placed as First rank.
- As ranked by 170 respondents, attractive packaging done by home bakeries is ranked second.
- As ranked by 170 respondents, home bakery providing high end quality products is ranked third.
- As ranked by 170 respondents, customization services are ranked fourth.
- As ranked by 170 respondents, home bakers adapting to market trends have been ranked fifth.

Inference

Majority of the respondents prefer home bakeries, as they provide products with good hygiene.

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WEIGHTED AVERAGE ANALYSIS

Level of agreement on factors of home bakeries

FACTORS	SA	A	N	D	SD	TOTAL	MEAN SCORE
Home bakeries are open and honest about the ingredients they use.	**99 (495)**	**24 (96)**	**33 (99)**	**8 (16)**	**6 (6)**	**170 (712)**	**4.19**
The delivery of the baked goods will be on time and safe.	**34 (170)**	**73 (292)**	**41 (123)**	**14 (28)**	**10 (10)**	**170 (623)**	**3.66**
Home bakers respond to the queries of customers quickly.	**23 (115)**	**42 (168)**	**15 (45)**	**66 (132)**	**24 (24)**	**170 (484)**	**2.85**
Home bakers adapt to market trends and update their skills.	**54 (270)**	**22 (88)**	**64 (192)**	**13 (26)**	**17 (17)**	**170 (593)**	**3.49**
Home baked goods are free from preservatives.	**87 (435)**	**48 (192)**	**7 (21)**	**12 (24)**	**15 (15)**	**170 (687)**	**4.04**

Source: Primary Data

Inference

The above table shows agreeance level of respondents towards certain factors of home bakeries. The highest mean score is 4.19 from the factor "Home bakeries are open about the ingredients they use."

CHI-SQUARE ANALYSIS

Gender and Consumer preferences for baked goods have shifted from traditional bakeries to home bakeries after the pandemic

HO1: There is no realtionship between Gender and Consumer preferences for baked goods have shifted from traditional bakeries to home bakeries after the pandemic

Cross tabulation						
Count						
		Consumer preferences for baked goods have shifted from traditional bakeries to home bakeries after the pandemic				Total
		Strongly agree	Agree	Neutral	Disagree	
Gender	Male	8	14	21	11	54
	Female	22	32	33	29	116
Total		30	46	54	40	170

Chi-Square Tests			
	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.997[a]	3	.003

The chi-square test of independence was conducted to examine the relationship between gender and consumer preferences for baked goods after the pandemic. The observed frequencies were compared to the expected frequencies, assuming that there was no relationship between the two variables.

The results of the test revealed that the chi-square value was 1.997 with 3 degrees of freedom and a p-value of .003. Since the p-value is less than the conventional level of .05, we can reject the null hypothesis (HO1) that there is no relationship between gender and consumer preferences for baked goods after the pandemic.

Therefore, we can conclude that there is a significant relationship between gender and consumer preferences for baked goods after the pandemic.

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CONCLUSION

The conclusion of the study is that the survey results provide valuable insights into the demographics and preferences of customers who purchase baked goods from home bakeries. The majority of respondents are female, aged between 26 to 35 years, and have completed SSLC. They value preservative-free baked goods, attractive packaging, and quick and responsive customer service. To successfully target this customer segment, home bakers should focus on marketing efforts through social media platforms like Facebook, ensuring eye-catching advertising and staying updated with market trends. They should also prioritize offering high-quality baked goods with functional packaging and responding quickly to customer inquiries.

While the survey indicates that home bakers are generally trusted and believed to be open and honest about their ingredients, there is room to further identify and cater to specific customer needs. Overall, home bakers who prioritize customer satisfaction, product quality, and trend awareness can expect to see increased success and customer loyalty.

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A SURVEY ON IMPACT OF WORK-LIFE BALANCE ON WORK PERFORMANCE OF EMPLOYEES AT WILDCRAFT INDIA LTD, BENGALURU

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ABSTRACT
The research study is mainly on the employee's work-life balance and analysing its impact on work performance. The title of the study is "Impact of Work-Life Balance on Work Performance of Employees. The study is being conducted to determine the influence of critical factors on work-life balance. The survey was based on collecting data from 165 employees of the managerial cadre at the Wildcraft manufacturing unit using a structured questionnaire. The findings of the research survey depict that there is an influence of work-life balance with work performance and there is a relationship between job position and level of stress on employees. Critical factors such as job security, compensation, organization culture, safety measures, and current working hours have a major influence on balancing career and personal life. The research concludes that both management and people have a role in work-life balance.
KEYWORDS: *Work-Life Balance, Work Performance, Health and well-being, Work Load*

I. INTRODUCTION

Work-life balance gains importance as a field of study, while occupations in the workplace begin to change due to economic uncertainty, leading to a struggle for existence in organizations. Work-life balance involves how much a person manages between work time versus non-work time. Over the years, reliance on information technology has led to an information crisis for employees. Employees must work overtime and be willing to work weekends. Employees are still expected to be on the phone always, respond to emails, and make quick calls outside of business hours. This causes stress in the workplace. Our complex society requires ongoing discussion about work, non-work time, and places.

The study's main aim is to comprehend and evaluate how work-life balance influences the employees at Wildcraft. Wildcraft India Limited is in the Footwear/Apparel/Travel Bags and Accessories Manufacturing industry and is based in Bengaluru, Karnataka, India. A global network of 175+ exclusive stores and 4000 multi-branded locations carry the company's products, and 20-30 new stores open each year. The company moved its focus to producing backpacks and other outdoor goods, as well as multi-terrain footwear and outdoor clothing. The study ensures whether employees experience a positive work-life balance or not. It has been an organizational challenge to encourage and motivate an employee for career growth and job satisfaction. This also leads to better management of physical health and implementing accurate decisions and working creatively in the working space in turn defines adequate time management for each task efficiently. Hence, the study is very much concentrating on the balance of the personal and professional life of each individual working in the organization.

II. OBJECTIVE OF THE STUDY

1. To examine how work-life balance has an impact on the work performance of employees.
2. To recognize the effects of key factors on the work-life balance of the participants.
3. To establish an association between the stress levels of Wildcraft employees and their job positions.

III. LITERATURE SURVEY

1. **Krishna Kishore S V (2022),** in the paper titled "Investigating Factors in Quality of Work-life in Indian Garment Industry at Bangalore," the author asserts that the organization's production was negatively impacted due to substandard practices and procedures. The survey focused on employees working in garment factories in Bengaluru, specifically those who hailed from rural areas. The author employed multiple regression and exploratory factor analysis to analyze the gathered data. Notably, the

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study strongly suggested that the level of safety in the workplace significantly influenced an employee's ability to balance their professional and personal life. [1]

2. **Asma Begum, (2022),** in the research article titled "Impact of Job Insecurity on Work-Life Balance during COVID-19 in India," the study strongly suggests a direct correlation between job insecurity and Work-Life Balance (WLB). The study involved 413 employees from diverse industrial sectors and explored five key hypotheses. The findings revealed that job instability significantly affected employees' health and was mediated by factors such as job demands, working hours, family obligations, and family demands. Additionally, job insecurity was found to be linked to conflicts between employment and family responsibilities. [2]
3. **Kumari Rashmi (2021),** in the research titled "Work-life balance: a systematic literature review and bibliometric analysis," the author conducted a comprehensive examination of 945 research papers on the topic of work-life balance, utilizing the Scopus database. The study focused on analyzing articles related to flexible work arrangements, gender differences in work-life balance, and the impact of policies and programs on WLB. These three key aspects emerged as the primary findings of the research. [3]
4. **Dr. Indu Gautam (2018),** in their study, "A Study of Work-Life Balance: Challenges and Solutions, gives information about how work-life balance is affected by psychological discomfort, work satisfaction, and family satisfaction. A distributed questionnaire was used in the study, which involved 190 people, both males and females, with or without children. aided by quantitative research techniques as well The addition of family-friendly programs like flexitime, time off in lieu, reduced working hours, and elder and child care support was also acknowledged as something businesses might implement and enhance. [4]
5. **Heejung Chung (2018),** In the paper titled "Flexible Working, Work-Life Balance, and Gender Equality: Introduction," the author conducts research by gathering data from diverse respondents in Europe. The study delves into the interactions between gender and class, while also analyzing the impact of different flexible working arrangements. Furthermore, the article specifically addresses various concerns related to family, organizational, and national policies concerning work-life balance and gender equality.[5]

IV. METHODOLOGY

The present study is empirical in nature. The data was collected from employees of Wildcraft India Ltd. Primary data is based on a survey through a structured questionnaire Google Forms created and circulated among the respondents for the responses and an interview method for a few respondents. Research papers, books, and online search engines like Google have all been used to gather secondary data.

The study involved 165 managerial personnel from various departments of the Wildcraft manufacturing unit. The study involves Managers of departmental units, the Human Resource Team, the In-charge, Executives, Industrial Engineers, the Quality Analyst Team, and Supervisors. The current study uses a stratified random sample technique that is based on probability sampling. The statistical software application SPSS (Statistical Application for Social Science) was utilized for testing hypotheses., Microsoft Excel, and Google Forms Chart. The statistical techniques include Chi-square, Correlation Analysis, and ANOVA Test.

V. HYPOTHESIS OF THE STUDY

H_{10}: There is no impact of work-life balance on the work performance of the employees.
H_{1a}: There is an impact of work-life balance on the work performance of the employees.

H_{20}: There is no significant relationship between job position and the stress level of respondents.
H_{2a}: There is a significant relationship between job position and the stress level of respondents.

H_{30}: There is no influence of critical factors on work-life balance.
H_{3a}: There is the influence of critical factors on work-life balance.

VI. RESULTS AND DISCUSSION

From the data analysis, and testing on the hypothesis it is seen that,

HYPOTHESIS 1:

H_{10}: There is no impact of work-life balance on the work performance of the employees at Wildcraft.
H_{1a}: There is an impact of work-life balance on the work performance of the employees at Wildcraft.

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Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.089[a]	4	.043
Likelihood Ratio	2.984	4	.160
Linear-by-Linear Association	1.268	1	.060
N of Valid Cases	165		

P value: 0.043
Level of Significance: 0.05
(LOS = 0.05 > P value 0.043)
According to the above output of SPSS, it is observed that X^2 calculated value is 11.089a which is greater than X^2 i.e., 9.488 at 5% “level of significance” (LOS) at 4 degrees of freedom. As a result, the alternative hypothesis, which depicts that there is impact of work-life balance on the work performance of the employees at Wildcraft, is accepted and the null hypothesis is rejected. In the current scenario, it is seen that there are work performance is dependent on work-life balance.

HYPOTHESIS 2:
H_{20}: There is no significant relationship between job position and the stress level of respondents.
H_{2a}: There is a significant relationship between job position and the stress level of respondents.

ANOVA
Factor: Job position
Dependent: Stress level of respondents

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	28.391	8	3.549	2.070	.042
Within Groups	267.403	156	1.714		
Total	295.794	164			

INTERPRETATION
P value is 0.042
Level of Significance is 0.05 (5%)
In alignment with the aforementioned findings of the SPSS, the level of significance is 0.05 and the p-value is lesser than 0.05. Therefore, the alternative hypothesis, which emphasizes there is a significant relationship between job position and the stress level of respondents, is therefore accepted, while the null hypothesis is rejected.

HYPOTHESIS 3:
H_{30}: There is no influence of critical factors on work-life balance.
H_{3a}: There is the influence of critical factors on work-life balance.

Critical Factor	Correlation Coefficient	Sig. (2-Tailed)
1. Job Security	**0.266****	**0.010**
2. Working hours	**-0.160***	**0.040**
3. Co-worker Relationship	**-0.490**	**0.528**
4. Compensation Structure	**0.163***	**0.036**
5. Organizational Culture and Safety Measures	**0.157***	**0.044**

The study illustrates the outcomes of respondents' work-life balance and job security. It is seen that job security has an effect on work-life balance.

The study shows a connection between the effect of working hours on respondents' work-life balance. Working hours have an impact on work-life balance, and it is inversely correlated.
The study shows how co-worker interactions affect respondents' ability to combine their both professional and private lives. It is depicted that, there isn't a substantial association between coworker relationships and Work-Life Balance.
The study shows how the respondents' work-life balance and the organization's compensation structure are related. It is seen that there is a considerable influence on the organization's compensation structure and Work-life Balance.
The study shows a link between safety measures and the overall culture of the organization's impact on respondents' work-life balance. From the above correlation analysis it is seen that, work-life balance has had an enormous effect on the organization's overall culture and safety measures.

VII. FINDINGS

- From the test of hypothesis, it is seen that it is seen that there are work performance is dependent on work-life balance.
- The respondents' stress levels have a strong connection with their job status. The organization has to define the job description and provide the extent of the tasks that are performed in the particular role and provide job clarity.
- Job security is directly related to work-life balance because it increases trust in the organization and feels secure and increases confidence.
- Work-life balance and present working hours are inversely proportional to with one another. To ensure the welfare and health of the workforce, governments should base the setting of working hours on industrial legislation. The company must review the working hours and overtime hours.
- In order to fully participate in the work and decision-making, it is vital to enjoy good working relationships with coworkers and managers. A strong team dynamic would assist the individuals and aid in the management of tasks and deadlines.
- It's vital for the organization to set organizational policies and safety measures that are apt to the workplace and work performance. Stringent policies would lead to attrition of employees due to an increase in stress and prepare to find an organization that has a better organizational culture.

VIII. CONCLUSION

The study was helpful in knowing the theoretical and practical aspects of the work-life balance in companies like Wildcraft. According to the study, it is seen that the organization must work on setting working hours appropriately as some employees suggest that they are missing out on their time with family commitments and personal events. The workload should be streamlined based on the demand and supply cycle that improves the efficiency of the work. The organization must focus on maintaining the gender ratio as the percentage of males is comparatively more than the female employees in the managerial cadre.
The organization should consider employees' commuting time as a decrease in the time in traveling will enable them to spend more time on their personal chores and family commitments and time for themselves. If these factors are in equilibrium, the employees will perform their work more efficiently and increase the productivity of the organization. Today's employees and organizations are increasingly concerned with finding a good work-life balance. There is growing research that links a work-life imbalance to decreased assistance and wellness for people and families. Therefore, it is not unexpected that more employees are becoming interested in implementing work-life norms. In the study, it is observed that employees face stress during their work and employees are satisfied with a balanced work-life. The research concludes that both management and people have a role in work-life balance.

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IMPACT OF POLITICAL, SOCIAL APPROACHES ON INDIAN EDUCATION SYSTEM

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ABSTRACT
Education is the process of transfer of knowledge, information directly or indirectly in active of Passive form from one person to another. It is rightly coined by our first Prime minister Shri Jawaharlal Nehru that education socialises the young children and makes them responsible, good citizens of the country by teaching them about various ethics and principles, morals. Education helps people to increase their income inborne, improve standard of living, and ultimately contribute to the country's gross domestic product. The young age of children is meant to study and not work. This problem child labour by identified by our visionary leaders at a very early stage and law was passed that completely abolished child labor. India is known as country of problems. In this heap of problems and gender discrimination is a problem we have always tried to eliminate. Education is a basic human right, so our constitution was framed with giving the status with basic human right by our visionary leaders. Lack of Education is the major cause that India is still in the long line of developing countries and not in the developed countries.

KEY WORDS-*Development, strategy, approaches, planning, constitution etc*

INTRODUCTION

Education has many forms and hence Education system clearly defines who which forms of education are acceptable and which and forms are not acceptable. Since Independence, the necessity for a dedicated education policy was felt by our nation builders. First Major educational policy was implemented in 1968 and it was followed by its successor in the year 1986. Now India is implementing its third major education Policy, coined as National Education Policy, 2020. The Implementation of the National Education Policy, 2020 was started in the year 2021. It focused on the 5+3+3+4 system instead of the previous 10+2 system. Due to this policy, there options for a degree, the are many exit options for a degree, the number of attempts to board exam is increased, the stress and anxiety of the board exam is reduced.

Due to this, the whole year of the student won't be wasted and student can get the benefits of giving two attempts of board exam in a single year. It also rectifies the faults of the previous. policies, it is more objective based, practical, includes the concepts that are need of the hour.
The effect of this policy can be soon seen with the increase in the gross domestic product, increased standard of living of the citizens.

STRUCTURE OF INDIAN EDUCATION

Structure of Indian education is a complex system that consists of various structures. India has a world largest population. So, Indian education is much diverse, dense all over the Speeded country. Structure of Indian education consists of three main stages-
1.Primary Education
2.Secondary Education
3.Higher Education

- Primary Indian education system is the first state of education A student from class categorized in this group having age group 6 to teachers 14 years old. In this level teachers focus on developing qualities like Leadership, sportsmanship, good human being. Various subjects such as science, history, geography, math etc. The main focus is to learn from Indian history and not to repeat the same mistakes which were done by previous leaders.
- Secondary education-This is the second stage of Indian education system. Students from class 9-12 are categorized having mainly age group of 14-18 years, this emphasized on developing physical and practical skills, to become a leader, and more than that a good human in a society. They are taught about their Constitution about history of their country, some science and advance math. This mainly focus on to diverge a student mind culture & humanity me might path of culture and humanity.

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- Higher Education: All universities and institution come under higher education system. Student take their official degree of various fields like B. Tech, M. Tech, PhD, BA, MA ,etc. Practical knowledge is being preferred. India has vast educational universities where our moral and culture are taught. Every religious festival is being celebrated; equality is followed.
- Right to education is the right of every student in India. The policy of fundamental rights is that everyone should be literate. For people below poverty level, the government schools and colleges are there where poor students can take their education. Many scholarship programs like Homi Bhabha Scholarship. National Scholarship are being run by the government to pursue to every skilled individual. mid-day meal policy is available in every primary government school of rural as well urban to give proper nutrition.

ADVANTAGES

India has a vast network of educational institutions that provide education to people of every background. Government actions to improve quality of education, resulted in increasing enrolment rates. Secondly, India has rich heritage of knowledge and tradition and educational system incorporates Arts, Commerce and Science. Moreover Indian education emphasizes theoretical as well as practical learning. All higher educational institutions like IITs, NITs, AIIMS have highly skilled professors. Critical thinking problem solving skills help students to tackle every situation. Sports facilities are there in every institution. Overall Indian education is vast and diverse and government is trying best to give right to education.

PROBLEMS IN THE INDIAN EDUCATION SYSTEM

Education plays vital role in development of human Crucial being's society, city. Education plays a crucial role in shaping the future of city, state, country and finally country. On the basis of literacy, a country can become developed. School and colleges are temples of Modern India. There are few problems in our educational system.

1)Access of Education Poverty

In our country some people are unable to take education due to their conditions. Poverty, naxalism are few problems which cause this. Due to this the students lags behind in education as well as the flow of technology. Especially girls are not allowed in many villages to receive education due to traditional mentality we have to overcome these problems.

2)Infrastructure and Quality

The quality of education in some villages of India is below average, so the technology, quality is very difficult to reach these villages due to their location. Infrastructure is also one of major part in Indian education system because some villages even don't have their own school building. So, it's very bad for us we have to reduce this problem as soon as possible.

3)Lack of Vocational Education

Vocational education is also important and students' life but our education system only focuses on academics not on vocational education in today's MNCs want skills like coding communication skills extra so vocational education is important for future of student

4) Lack of Good Teachers

Teacher is very important to students' life but in some areas of India one teacher control hundred or 120 students so in that case it is very difficult to concentrate on each and every student quality and qualification of teacher should also be checked by improving the interview process.

5)Lack of Technology in India

More schools don't have e-learning sound system TV computers etc so the students don't know about technology so the students lag in technical education then cities students so it is also a big problem 6) Indian education system is focus on academics only not focused on extracurricular activities like sports dance singing extra so the students who are good at these activities are unable to score well marks so it lags in the subject.

7) Outdated Examination System

Examination system is not updated so the information regarding new research is unable to reach the students.

8) Lack of Research Facility

Indian education system research is always under rated most of the schools are focus on only theory not on practical's so shouldn't don't know about practical knowledge so it is important to add practical knowledge in Indian education system

9)Lack of Communication Skills training

Most of the students of India is very well in theory and in academics but they have lack of confidence while taking to talking to someone in English language so it is important that all schools should teach English so that job and so they can be well in life.

SUGGESTIONS

Focus on teacher training: Providing adequate training and professional development opportunities for teachers to enhance their teacher methodologies and pedagogical skills.

Curriculum Reform: Practical based learning should be implemented instead of focus on rote learning so that appropriate skills can be developed.

Integration with Technology: Internets and computers should be introduced in regular classrooms so that students and teachers can have access to world class material.

Infrastructure: Infrastructure should be developed in order to bridge the gap between rural and urban educational institutions.
Inclusive Education: Inclusive education policy should be, promoted so that everyone irrespective of their economic and social background can have access to education

Scholarship and Financial Assistance: Scholarships and financial assistance should be provided to students from backward economic communities so that money can't be a hindrance to their education.

Development of Infrastructure: Infrastructure should be appropriately developed as to provide basic amenities like clean drinking water, proper sanitation facilities so that students can remain in school for whole day.

Mid-day Meal Program: This program should be implemented so that students from poorer communities can get a nutritional diet.
Technology: Mobile and internet should be provided, so that education can be accessed in remote regions as well as via online textbooks and classes.

Teacher Training and Recruitment: Robust teacher training and recruitment program should be implemented so that talented people are attracted to this job. Continuous training of recruited teachers should be done over the years so that they can update their knowledge and teaching methodologies.

Incentives: Teachers should be provided with incentives, higher salaries, career growth opportunities so that they can have access to world class teaching resources.

Curriculum Reform: Curriculum should be changed and vocational training should be introduced so that students can learn appropriate skills required for industries instead of just focusing on rote learning.

Industry-Institution Collaboration: Industries and institution should collaborate so that students can be trained according to industry standards and be given internships.

Recognition of Vocational Qualification: Ensure that vocational qualifications are recognized and valued by employers and society, promoting the importance of vocational education as viable career option.

CONCLUSION

The Indian Education system faces various challenges that impact its quantity, inclusivity and effectiveness. However, by addressing these and implementing the proposed solutions, it is possible to create more inclusive, quality driven holistic education system in India. It requires concerted efforts from policy makers, educators, parents and society as a whole to prioritize education, invest in infrastructure, improve teacher quality, promote technology, integration and ensure equal access to education for all.

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THE GLOBAL CONTRIBUTION OF THE SHANGHAI COOPERATION ORGANIZATION IN THE CONTEXT OF THE COMMUNITY OF HUMAN DESTINY

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ABSTRACT
Assessing the Shanghai Cooperation Organization's (SCO) impact within the framework of a shared human future is crucial not only for the SCO's own success but also for advancing the "Shanghai spirit" to address pressing global issues. The SCO has consistently evolved and its influence on the global stage has progressively expanded. Viewed through the lens of a shared human destiny, the SCO's significance lies in its ability to offer innovative frameworks for reshaping international relations, forging new pathways towards collective growth and prosperity, creating platforms for intercultural dialogue and appreciation, and consolidating key resources to enhance global governance.
KEYWORDS: *Community of Human Destiny, Shanghai Cooperation Organization, The Global Contribution*
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INTRODUCTION

In today's interconnected world, international organizations play a pivotal role in shaping the socio-political and economic landscapes. One such organization that has gained considerable attention over the past few years is the Shanghai Cooperation Organization (SCO). Founded in 2001 by China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan, the SCO's main objectives are regional security, economic cooperation, and cultural exchange among its member countries. However, its role has broadened to encompass wider global challenges.

The concept of a 'Community of Human Destiny' serves as a prism through which the global contribution of the SCO can be understood in a comprehensive manner. Rooted in the idea of collective well-being and shared future, this concept opens the door to broader discussions around global governance, international relations, economic prosperity, and cultural understanding. In this article, we aim to unpack the multifaceted role of the SCO in light of its contributions to building a Community of Human Destiny.

LITERATURE REVIEW

The body of academic literature on the Shanghai Cooperation Organization (SCO) has been extensive, yet its exploration within the context of a Community of Human Destiny remains an underexplored area of research. Here, we categorize the literature into four main streams to provide a comprehensive understanding of the SCO's role and its relevance to the global community.

Early research on the SCO primarily centered around its role in maintaining regional security in Central Asia. Fredholm, M. (2005) in "The Shanghai Cooperation Organization and Eurasian Geopolitics," analyses the SCO's geopolitical strategies aimed at counterbalancing Western influence. His work serves as a fundamental foundation for understanding the SCO's original mandate of maintaining security and political stability in the Eurasian region. However, Fredholm does not touch upon the SCO's broader influence in the realm of global security, an aspect that later research has attempted to cover.

An important strand of literature focuses on China's influence within the SCO. Breslin, S. (2007), in "China's New Diplomacy," delves into China's role as a geopolitical player utilizing the SCO as a soft power platform. He argues that China's leading role within the organization has served its interests in projecting a benign form of hegemony, particularly within the Asia-Pacific region. While this provides a detailed understanding of China's objectives and strategies, it leaves room for exploration of the SCO's broader global objectives and their alignment with the concept of a Community of Human Destiny.

The economic aspect of SCO has gained attention in more recent years. In "The Economics of the Shanghai Cooperation Organization" by Chen, X. (2012), the focus is on the organization's efforts to establish a free trade zone and its broader impact on global economic cooperation. Chen's work emphasizes the economic benefits accrued to member states but stops short of exploring how the SCO's economic initiatives might contribute to a shared prosperity that is fundamental to a Community of Human Destiny.

A less explored but increasingly important line of inquiry focuses on the SCO's role in fostering cultural exchange and civilizational dialogue. Yang, L. (2019) in "Cultural Diplomacy and the Shanghai Cooperation Organization," argues that the SCO has made significant strides in promoting mutual cultural appreciation through organized events and diplomatic initiatives. Yang touches on the humanistic aspect of the SCO but does not elaborate on how it ties into the grander narrative of a Community of Human Destiny.

ANALYSIS AND RESULTS

The growth of the Shanghai Cooperation Organization

The world is now in the midst of the greatest change of the century. On the one hand, the accelerated evolution of this great change has led to a deepening of the interconnectedness and interdependence of all countries in the world, a more balanced balance of international power, a general trend towards peaceful development, and a community of human destiny in which all countries are part of each other. On the other hand, the world is facing outstanding instability and uncertainty, with weak momentum in world economic development, the rise of regional hotspot issues, and the continued spread of non-traditional security threats such as environmental pollution, terrorism, cyber security and major infectious diseases. In the face of a complex and ever-changing world, where does humanity go from here? Cooperation or confrontation, mutual benefit or beggar-thy-neighbour……Against this backdrop of world history, it is of great value to examine the development and growth of the Shanghai Cooperation Organisation and the concept of a community of human destiny it embodies.

The SCO has gone through a process of conception, creation and development. On 26 April 1996, the leaders of five countries - China, Russia, Kazakhstan, Kyrgyzstan and Tajikistan - met in Shanghai and signed "the Agreement on Strengthening Confidence in the Military Field in the Border Areas", aimed at resolving historical border issues and strengthening military mutual trust at the border. [1]With the expansion of the five countries' regional cooperation areas and the enhancement of their influence, the five countries' regional cooperation organisation has been upgraded to a higher level, not only with the expansion of regional cooperation members, but also with the improvement of its mechanism and the further expansion of its cooperation areas. On 14 June 2001, Uzbekistan joined the five-nation regional cooperation. On 15 June of the same year, the Heads of State of the six countries signed "The Declaration on the Establishment of the SCO", and the SCO was formally established in Shanghai. Two new member states, India and Pakistan were added to the SCO in 2017, increasing the number of member states from six to eight, and to increase to 9 member countries in 2022. In 2017, "Promoting the building of a community of human destiny"was included in the Astana Declaration of the Heads of State of the SCO. In 2018, the "common idea of building a community of human destiny" was included in the Qingdao Declaration of the Council of Heads of State of the SCO. In 2021, China proposed at the Qingdao Summit that the future development of the SCO should be based on the concepts of innovation, coordination, green, openness and sharing, further enriching the connotation of the "Shanghai Spirit", which has had a profound impact on promoting the building of a community of human destiny. In 2022, at the 22nd Shanghai Cooperation Summit in Marhan, Uzbekistan, a consensus was once again reached on building a SCO community of destiny, which has injected positive energy into promoting the building of a community of human destiny. At present, the SCO has become the world's most extensive and populous comprehensive regional organization, and with its continuous development and expansion, it has also increasingly demonstrated its strong cohesive and appealing power, providing an important platform for practicing the concept of the community of human destiny and injecting strong impetus into the international community's practice of building a new type of international relations with win-win cooperation at its core.

Analysis of the global contribution of the SCO in the context of the Community of Human Destiny

First, it provides a new concept for building a new type of international relations. Since its inception, the SCO has always upheld the "Shanghai spirit" of "mutual trust, mutual benefit, equality and consultation, respect for diverse civilizations and the pursuit of common development", resolutely opposed the Cold War mentality, power politics and hegemony, promoted the democratization of international relations and multipolarity, and promoted the establishment of a new type of international relations with win-win cooperation at its core. With the changes of the times, the SCO, keeping pace with the times, has continuously enriched the connotation of the "Shanghai spirit". For example, Chinese leaders have repeatedly stressed the need to build a common destiny for mankind, especially advocating the abandonment of zero-sum games and bloc politics and the joint adherence to genuine multilateralism. In 2022, on the eve of the 22nd summit of the SCO, the Uzbek leader sent a message to show the world the results of the SCO's development over the past year, summarising in particular the SCO's contribution to the transformation of the modern system of international and regional relations, and emphasising the "Samarkand spirit", which symbolises "cooperation, mutual understanding and friendship" , and is intended to organically complement the "Shanghai spirit", among other things. The concept of "Shanghai Spirit" is in line with the trend of the times , and has therefore been highly recognized by other member states, and is

[1]Yongbiao-Zhu ,Yueyan-Wei.Analysis of the stages of development and prospects of the Shanghai Cooperation Organization[J].Contemporary Asia Pacific,2017(3):P42.

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gaining more and more influence in the world. Guided by this philosophy, the SCO has, after 21 years of perseverance and practice, become a model for building a new type of international relations.

Second, it explores new paths for common development and common prosperity. The important successful experience of the SCO is its “adherence to mutual political trust” and “adherence to mutually beneficial cooperation”. At the 22nd Summit of the SCO, General Secretary Xi Jinping said, “Increasing mutual support”and “a better life for the peoples of the region is a common goal that we are determined to achieve”. Over the years, the SCO rganization has been committed to promoting peace and stability as well as development and revitalization, adhering to the principle of mutual consultation, construction and sharing, strengthening the dovetailing of development strategies, and always following the path of mutual benefit and common prosperity. For example, China's “One Belt, One Road” initiative, Russia’s “Greater Eurasia Partnership”, and the North-South International Transport Corridor are all fruitful achievements on the road to mutual benefit and prosperity. According to statistics, the SCO economy accounted for 22.5% of global GDP in 2019[2].Since the outbreak of the epidemic, the SCO member states have united in good faith to help each other, and have taken a series of political, economic and financial measures to gradually restore sustainable economic development, with the fruits of cooperation between the countries benefiting the people. The achievements of the SCO have proved with hard facts the inevitability and feasibility of the path of mutual benefit and common prosperity for all countries, and laid the foundation for the construction of a “development community” and a “community of destiny”.

Thirdly, it has built a new platform for cultural exchange and mutual appreciation of civilizations.
Strengthening humanistic exchanges and mutual appreciation of civilizations is one of the important elements of the SCO, which also lays the foundation of public opinion for the prosperity of the SCO. For more than two decades, the SCO has been expanding its areas of cooperation, from security cooperation to economic cooperation and then to humanistic cooperation. Humanities cooperation has become one of the three pillars underpinning the development of the SCO. In May 2019, at the opening ceremony of the Asian Civilisation Dialogue Conference, Comrade Xi Jinping proposed that “civilisations communicate through diversity, learn from each other through exchange, and develop through mutual appreciation. Civilisations should strengthen exchanges and mutual appreciation among different countries, nationalities and cultures in the world, and consolidate the humanistic foundation for building a community of Asian destiny and a community of human destiny together.” In May 2019, at the opening ceremony of the Asian Civilisation Dialogue Conference, Comrade Xi Jinping proposed that “civilisations communicate through diversity, learn from each other through exchange, and develop through mutual appreciation. Civilisations should strengthen exchanges and mutual appreciation among different countries, nationalities and cultures in the world, and consolidate the humanistic foundation for building a community of Asian destiny and a community of human destiny together.” At this critical moment of transition between the old and new international order, the SCO has always upheld advanced concepts, followed the trend of global development, and used the organization as a platform to build a “community of destiny” that shares the interests of regional stability, security and development, making an important contribution to the maintenance of regional stability and global strategic stability. Among these, humanistic cooperation plays an irreplaceable role.The strengthening of humanities cooperation in the SCO has built a platform for cultural exchanges and mutual appreciation of civilizations, strengthened the SCO’s sense of community of destiny, promoted people-to-people contacts, laid the foundation for generations of friendship between countries and peoples, and injected an endogenous impetus for building a community of destiny.

Fourth, it brings together important forces for strengthening global governance.
At present, global governance is facing a major dilemma. Some countries are practicing unilateralism and protectionism, global governance is in serious deficit, and the functioning of global governance mechanisms of the United Nations, the G20 and other organizations are facing serious challenges. In this regard, strengthening global governance is of urgent relevance.The “Shanghai Spirit” of mutual trust, mutual benefit, equality, consultation, respect for diverse civilisations and the pursuit of common development advocated by the SCO plays a unique role and influence in enhancing SCO’s role in global governance. The SCO has made remarkable progress in more than two decades. In terms of participation in global governance, it has evolved from a pre-expansion focus on internal building to a post-expansion acceleration of outward-looking development, which has strengthened its participation in global governance. Moving from regional cooperation to regional governance, the SCO has become the frontline of global governance, with expanding areas of governance in political, security, economic, cultural, natural, social and military fields. The member states are facing the difficulties and challenges encountered in development together, transcending the cold war mentality and zero-sum game, and truly practicing the concept of common understanding, construction and sharing, and striving to play an important role in regional and even global governance, such as maintaining peace and security in Asia and Europe, joining hands with China, Russia and Central Asian countries to combat epidemics, promoting the stable economic development of regional countries, and actively exploring good solutions to address the problems of climate change, water distribution and poverty alleviation

[2] Norov(The SCO Secretary General). The economies of SCO member states account for 22.5% of global GDP, with total foreign trade exceeding US$6.3 trillion[EB/OL]. [2019-07-06]. http://
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in the region.

CONCLUSION

Terms such as the Shanghai Cooperation Organisation, the "Shanghai spirit", the community of destiny and global governance are hot topics in the field of political studies.Compared to the SCO's status and influence in regional development and internationally, academic research on the SCO's global contribution does not match, is still in its infancy, and still has much room for theoretical upward mobility. Therefore, the academic community still has a heavy responsibility and urgently needs to conduct systematic research on the global contribution of the SCO, both theoretically and practically, to provide intellectual support for the promotion of the SCO's prosperity and development, and to contribute to the full play of the SCO's functions.

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THE IMPORTANCE OF DEVELOPING STUDENTS' CREATIVITY AND INNOVATIVE IDEAS IN PRIMARY EDUCATION

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ANNOTATION

From the first days of Education, various conflicts, contradictions, internal discord arise that move the development of children of a small school age. These are the contradictions between the level of psychic maturation in a child and the requirements with positive qualities. The further increase in requirements assumes the child's psychically uninterrupted development, and this development is achieved as a result of the continuous movement of the chain, the maturation of a person.

KEYWORDS: *ability, innovation, pedagogical skills, education, innovations, knowledge, innovative process, innovative formation.*

INTRODUCTION

The role of activity is great in the comprehensive maturation of the human personality, their acquisition of knowledge, skills and skills, the acquisition of forms of attitude towards the world around them and norms of behavior, decency. It will consist of any activity, purpose, style, result and processes. It depends on physical actions on the one hand, and on the other it occurs in the mind by means of mental action.

The development of Science and modern technologies is one of the priority tasks to be solved in the implementation of the socio-economic development of the Republic of Uzbekistan, in order for the Republic of Uzbekistan to enter the world markets and take a worthy place there, it is imperative to form an economic system in which the achievements of science are widely used, And in order to perfectly cope with such a responsible task, great importance has been attached to the rapid development of National Science and the personnel training system.

In modern society, the issues of harmonizing one's inner and outer culture, establishing their objective criteria, are extremely important. We can say that this is evident in the rapidly evolving globalization process. The struggle for a worthy place in this space does bypass Uzbekistan[1]. Globalization is the process of increasing interconnection between different countries and regions of the world. The convergence of countries of the world in the socio-economic, political and cultural spheres, the integration of events into one country on the universal scale. It is no wonder now that a lot of money is spent on processing information, delivering it to a designated space, and being the first to deliver it. After all, young people have a perception that it is always right to provide information[2]. This will allow them to disseminate any information they want from their own interests.

MAIN PART

Labor, Play, Reading are considered the main types of human activity. Human activity is the necessary conditions for its development, in the process of these conditions it acquires life experience, perceives the surrounding world, assimilates knowledge, generates skills and skills[3]. With these, activity develops. Creativity, on the other hand, is a process of human activity that creates qualitatively new, material and spiritual resources, which in itself represents the ability of a person to manifest in labor.

Today's globalization process, along with the modernization of society, bypasses any society or state. Therefore, their positive and negative effects are seen in social life, especially in the case of young people who have the power to influence the country's future. Particularly the currents that are trying to influence our youth in various ways, the so-called “mass cultures” are aimed at provoking youth in such a way as national identity, patriotism. The ability to withstand such modern threats is a time-consuming use of national spiritual heritage and Islamic culture, which is a national idea and its basic principles in the implementation of the country's strategic goals and objectives.

In the ideological landscape of the world, regardless of how much money is spent, the issue of education and training is important. This is the fourth priority of the "Strategy of Action for the five priority areas of development of the Republic of Uzbekistan in 2017-2021", adopted at a new stage of development of Uzbekistan. The establishment of effective mechanisms for the implementation of innovational achievements in the information society is highlighted.

Promoting research and innovation in our country, creating effective mechanisms for the implementation of scientific and innovation achievements in a global ethical culture in the image of a global-minded future person: - the formation of such important qualities and qualities as self-education, self-improvement[4]. At the same time, it envisages significant changes in the global community from the principles of ethical culture and the traditional way of life to the modernization of young people. It is important for the individual to feel the importance of individual, self-awareness and self-organization qualities and abilities, worldview and cultural breadth and openness and tolerance, especially for young people[5].

In primary education, any activity is manifested in real conditions, in different ways and in different manifestations. Even because each action being performed is aimed at a certain thing – the subject, the activity is conceived as a set of actions with the subject. Subject actions will be aimed at changing the properties and quality of objects in the outside world. For example, when an elementary school student is dropping a certain note in a notebook. his movement will focus on writing, and his movement to expand the scope of knowledge through writing will increase.

It is known that in the present era, a mentally intelligent, creatively gifted, inquisitive young people are a huge source of strength that moves the scientific technical progress of society, which in the future will have to be integrated with the world community in all areas. In this regard, the search for young talented specialists, their correct orientation is one of the highest goals.

The power of any country is determined by its intellectual potential. And this directly depends on the quality of education. The system of general education that is being formed in our country contributes to the disclosure of the intellectual and moral potential of students, training in accordance with their abilities and capabilities, the education of gifted youth, contributes to the correct and informed choice of the path in the future, serves to ensure the adaptation of students to the changing requirements of the labor market and educational labor.

Promoting research and innovation, creating effective mechanisms for the implementation of scientific and innovation achievements occurs when the youth abandons life, cultural and behavioral stereotypes that keep them engaged in professional, political and social progressive processes. For example, the penetration of globalization under the guise of "popular culture" creates dangerous ideas among young people such as moral corruption, violence, and enrichment at the expense of foreign ideas. Against it, "combating innovative ideas and modern mechanisms" will dramatically reduce crime and crime among young people. It helps us to “see” what is happening around us and not to be calm and indifferent.

In conclusion, in the context of globalization, there are different approaches to the upbringing process, and these approaches should be taken into account in the process of spiritual and moral education[6]. Social activity of young people, its genuine civic attitude, its commitment to democratic reforms will be an important factor in achieving the goals as soon as possible.

Interest in the content of education, in the acquisition of knowledge is inextricably linked with the reader's feeling of satisfaction with the result of his own mental work. This feeling is manifested by the encouragement of the teacher and forms a tendency, desire, need to work more efficiently in the student. The feelings of pride, confidence in one's own strength that arise in a child serve to assimilate knowledge and strengthen skills, and their educational impact increases if stimulation and punishment are in moderation. Interest in the content of education, in the acquisition of knowledge is inextricably linked with the reader's feeling of satisfaction with the result of his own mental work. This feeling is manifested by the encouragement of the teacher and forms a tendency, desire, need to work more efficiently in the student. The feelings of pride, confidence in one's own strength that arise in a child serve to assimilate knowledge and strengthen skills, and their educational impact increases if stimulation and punishment are in moderation.

CONCLUSION

The current stage of development of society and the state requires that scientific and innovative ideas comprehensively increase the overall literacy of the participants in the relationship. To date, the harmonization of education has become an important task. Because, if education is separated from education, that is, to educate young people, and lag behind in applying this knowledge, values such as patriotism, patriotism, responsibility to parents and mahallas will be neglected. That is why we should never forget that encouraging research and innovation, creating effective mechanisms for implementing scientific and innovation achievements requires a great responsibility of young people.

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STEP-BY-STEP ALGORITHM FOR WORKING WITH A CONFLICTED PATIENT

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ABSTRACT
This article examines a step-by-step algorithm for working with a conflicting patient.
KEYWORDS: *prevention, medicine, medical culture, work with patients, medical psychology, diagnostics, algorithm.*

ПОШАГОВЫЙ АЛГОРИТМ РАБОТЫ С КОНФЛИКТНЫМ ПАЦИЕНТОМ

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Аннотация: В этой статье исследуется пошаговый алгоритм работы с конфликтующим пациентом.
Ключевые слова: профилактика, медицина, медицинская культура, работа с пациентами, медицинская психология, диагностика, алгоритм.

Медицинский центр не успевает предоставить необходимые анализы больного в срок, призванные подтвердить или опровергнуть необходимость оперативного вмешательства. Пациент ругается, угрожает отказом от дальнейшего сотрудничества с данной клиникой, угрожает судебными тяжбами. Что делать?

Шаг 1 – Выслушать

В результате пациент «выпускает пар», а Вы, как врач, ведущий данного пациента, имеете возможность спланировать дальнейшие действия.

Очень трудный шаг. Он требует терпения, внимания и даже мужества. Очень хочется сразу оборвать возмущенного человека, особенно если он кричит не по делу, и ответить ему чем-то вроде «сам дурак». Но если мы так поступим, то есть оборвем его на полуслове, то, как, же мы поймем, чем недоволен этот пациент?

Не дав человеку возможность выговориться, мы не погасим его негативные эмоции. И не сможем донести до него свою точку зрения. Известно, что, пока человек не высказал все, что у него «накипело», он не способен услышать других. Позволяя ему излить душу, мы тем самым расчищаем свой путь к ЕГО ушам. К тому же нередко бывает, что, высказав вслух свою претензию, пациент сам начинает понимать, что она не обоснована. Вот почему этот шаг первый и основополагающий. Но для пациента важно не просто, что вы слушаете, а КАК вы слушаете. Можно слушать, лишь делая вид, что слышишь. Можно слушать, внутренне не соглашаясь с тем, что пациент говорит, оценивая его слова, и это сразу же будет заметно. Можно слушать,

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договаривая за пациента начатые фразы, как бы предвосхищая его мысль - и это тоже будет раздражать, так как вы покажете, «что вам и так все известно». Слушая, старайтесь понять и смысл, и эмоции. Старайтесь взглянуть на ситуацию глазами пациента - тогда это будет понимающее, активное слушание.

Шаг 2 – Уточнить

После того, как вы пациента выслушали, очень важно показать ему, что вы правильно поняли суть высказанной претензии. Для этого надо просто повторить ее своими словами. Используйте следующие обороты «понимающего слушания»: «Если я вас правильно понял(а), произошла следующая ситуация ….», «То есть вы хотите сказать…»

Для чего и кому это нужно? Прежде всего, вам самим. Важно убедиться, что вы пациента правильно поняли, разобрались, в чем именно состоит причина недовольства, иначе конфликтная ситуация не может быть разрешена. Это нужно и пациенту, поскольку показывает ему, что вы всерьез отнеслись к его словам, услышали их. Это еще один шаг, снижающий температуру раздражения.

Шаг 3 - Выразить понимание

Покажите пациенту, что вы его поняли, что его проблемы вам не безразличны. Например: «Я хорошо понимаю, что …..», «Спасибо, Иван Иванович, что Вы затронули этот вопрос», «Да, это неприятный момент».

Крылатая фраза «Клиент всегда прав» может быть переформулирована таким образом: «Пациент не всегда прав, но он всегда имеет право на выражение своих эмоций». И это право надо признать. Мало этого, пациенту обязательно надо посочувствовать.

Представьте себе такую ситуацию. Вы собираетесь на юг и берете с собой свою собаку. Но подойдя к вагону, проводник вам говорит:

Вариант 1. «Собака должна быть в товарном вагоне. Таковы правила».

Вариант 2. «Мне очень жаль, что ваша собака не может ехать с Вами. У меня тоже дома есть пес, и я понимаю ваши чувства, но, к сожалению, таковы правила».

Какой вариант вам больше понравился? По сути, сказано одно и то же, но по форме – разное, и реакция на слова – тоже разная.

Поэтому нужно уважать чувства других людей. Очень важно посочувствовать пациенту, выразить понимание. Это самый сложный шаг – но самый эффективный.

ПРЕТЕНЗИИ ПАЦИЕНТА

Предупреждение конфликтов: информирование пациента.

Очень часто пациенты относятся к предстоящим лечебно-диагностическим процедурам с большой настороженностью. Обычно это связано с искаженным представлением о предстоящей процедуре, отсутствием нужно информации и неудачном опыте нахождения в медицинской организации.

Для того, чтобы не позволить этим сомнениям вырваться наружу и перерасти в конфликт, рекомендуется придерживаться следующих правил:

- Дайте пациенту полную информацию о его состоянии, о предстоящих процедурах. Подробно остановитесь на каждом этапе манипуляции, ответьте на все вопросы, которые интересуют пациента.
- Дайте пациенту возможность высказаться о своих опасениях и страхах. Если пациент будет чувствовать опасность, его сопротивление приведет к конфликту.
- Позвольте пациенту самому принимать решения.
- Когда манипуляция будет закончена, поинтересуйтесь у больного, как он себя чувствует, какое у него настроение. Внимательно выслушайте пациента, даже если его реакция является негативной.

Истеричный пациент

Истерика является ответной реакцией человека на свой собственный страх, неудачу. Она возникает как бессознательный протест, но при закреплении такой формы реагирования может трансформироваться в форму манипулирования окружающими.

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Признаки:
▪ быстрый темп речи;
▪ эмоциональная жестикуляция, чрезмерная подвижность;
▪ эмоциональное перевозбуждение;
▪ рыдания, крики, неконтролируемые эмоции.
▪ Истеричные пациенты легко передают свое состояние окружающим и усугубить обстановку.

Правила работы с таким пациентом:

▪ Перейдите с пациентом в другой кабинет или удалите окружающих – без лишних зрителей люди в состоянии истерики успокаиваются быстрее.

▪ Переключите его внимание на себя – встаньте к нему лицом.

▪ Совершите действие, которое не подходит ситуации и сможет отвлечь пациента – щелкните пальцами, хлопните в ладоши и т.д.

▪ В общении с пациентом используйте спокойный, но уверенный тон. Используйте такие фразы, как «Прекратите!», «Успокойтесь!» и т.д.

▪ Истерика отнимает у больного много энергии, и когда он успокаивается, он чувствует себя слабым и опустошенным. В таком состоянии он нуждается в помощи медработника.

Горюющий пациент

Плач позволяет пациенту избавиться от негативных эмоций, вызванных жалостью к себе, страхом, горем. Также слезы позволяют регулировать эмоции, снижают психологическое напряжение.

Признаки:
▪ слезы, вздрагивание тела;
▪ характерная мимика;
▪ опущенная голова;
▪ закрытая поза.

Правила работы с горюющим пациентом:

▪ Поговорите с пациентом, установите с ним вербальный контакт.

▪ Говорите тихим голосом, темп речи должен быть неторопливым.

▪ Дайте пациенту понять, что вы понимаете, как ему тяжело.

▪ Не используйте такие фразы, как, например, «Я тебя понимаю» - это может вызвать вспышку агрессии.

▪ Используйте приемы активного слушания – повторяйте окончания фраз, установите зрительный контакт с пациентом, кивайте во время разговора с ним.

▪ Не запрещайте пациенту плакать, находитесь рядом с ним.

▪ Возьмите больного за руку, положите свою руку ему на плечо или на спину.

Испуганный пациент

Испуг связан с переживанием страха и является рефлекторной реакцией организма на возможную опасность.

Признаки:
▪ напряженная, застывшая поза;
▪ непроизвольное мочеиспускание или дефекация (в редких случаях);
▪ бледная кожа;
▪ озноб;
▪ частое и поверхностное дыхание;
▪ расширенные зрачки, широко открытые глаза.

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Как успокоить испуганного пациента:

▪ Пациенту необходима психологическая поддержка – положите свою руку ему на запястье для того, чтобы он ощутил ваше спокойствие, и оно передалось ему.

▪ Поговорите с больным о его чувствах.

▪ Предложите пациенту дыхательные упражнения, направленные на стабилизацию этого психологического состояния, предложите ему успокаивающий массаж.

▪ Подстройтесь под темп дыхания и позу пациента.

Агрессивный пациент

Агрессия опасна тем, что она является неконтролируемой реакцией человека, которая помогает ему снизить эмоциональную нагрузку. Во многих случаях агрессия связана с характером больного, выражается в физической и словесной форме и может быть проявлением манипулятивного поведения.

Признаки агрессии:

▪ пациент выражает в адрес медперсонала словесные оскорбления;
▪ активная жестикуляция;
▪ крик;
▪ провокации в адрес врача;
▪ сжатые в кулаки ладони;
▪ сжатые челюсти, хмурые брови, напряженное лицо;
▪ прилив крови к коже лица;
▪ удары по окружающим предметам и т.д.

Как успокоить агрессивного пациента:

▪ Выслушайте пациента, не перебивая его, не спорьте с ним и не противоречьте ему.

▪ Отведите пациента в тихое помещение или удалите из кабинета окружающих.

▪ Разрядите обстановку шуткой или предложите пациенту ударить подушку, выполнить какое-то физическое действие, чтобы он мог выразить свою агрессию другим способом.

▪ Избегайте прямого контакта глаз с пациентом.

▪ Попробуйте погасить агрессию пациента угрозой наказания или собственными активными действиями. Способ работает, если вероятность наказания действительно велика и имеет значение для больного.

Боится

Любой врач, общаясь с пациентом, должен делать поправку на то, что каждая болезнь, так или иначе, изменяет душевное состояние человека, уводя его всё дальше от нормы. Даже незначительное заболевание пробуждает существующие у каждого в той или иной мере страхи:

· страх тяжелой болезни или смерти
· страх потерять работу
· страх инвалидизации или физической ущербности
· боязнь ограничений лечебным режимом или диетой
· страх перед вероятными болезненными или эмоционально некомфортными лечебными или диагностическими манипуляциями
· опасения по поводу непредвиденных и возможно немалых расходов, связанных с лечением

То есть, любой пациент встречается с врачом уже находясь в состоянии повышенной тревожности, поскольку под угрозой находятся его базовые ценности.

Профилактика: Пожалуй, единственный способ уменьшить беспокойство пациента (кроме того, чтобы вылечить его болезнь) — самому излучать спокойствие, говорить мягким голосом, не суетиться и проявить максимум внимания.

Не доверяет врачу

К сожалению, сегодня престиж врачебной профессии и медицинских учреждений невелик. Общественное мнение утвердилось на позиции «врачи плохо работают», «поликлиники никуда не годятся». Из этого недоверия происходят попытки направлять и контролировать работу врача, а также растет популярность самолечения. И то и другое — богатейшие источники конфликтных ситуаций. Недостаток знаний о состоянии своего здоровья в сочетании с большим количеством неадекватной информации из посторонних источников рождает ошибочное восприятие болезни и лечения, а также неудовлетворенность действиями врача, то есть делает пациента «конфликтноопасным». Кроме того, между врачом и пациентом без медицинского образования существует некоторое информационное неравенство и ситуация зависимости, и часто пациенты тяжело это переживают, что создает дополнительную подозрительность или тревожность.

Профилактика: Покажите пациенту того врача, которого он хочет видеть, — внимательного, компетентного, понимающего его трудности и готового помочь. Желание скандалить, как правило, утихает по мере того, как появляется доверие.

Стратегия и тактика

Первоочередная задача на пути предотвращения конфликта — грамотно выстроить общение. В этом поможет определение целей сторон. Для врача важно без особых сложностей провести прием, оформить документацию и перейти к следующему пациенту. Цели пациентов существенно разнообразнее. Цель получить обследование и лечение, выздороветь и идти домой — встречается не так уж часто и к конфликтным ситуациям, как правило, не приводит. Немедицинские же цели (например, пообщаться, получить больничный или инвалидность или комментарий по поводу назначенного в другом месте лечения) чаще всего не достигаются. Не получивший желаемого пациент автоматически винит в этом врача и спешит проявить свои негативные эмоции. Важнее всего в случаях подобных запросов отказывать пациенту быстро, аргументированно и категорично, объясняя свой отказ вашими должностными приоритетами.

Нужно постоянно помнить, что врач и пациент находятся в одной лодке. Доктора перегружают работой — больной с трудом записывается на прием и сидит в очереди. Врача ограничивают в назначении исследований и процедур — больной рискует собственным здоровьем. Нехватка финансов приводит к тому, что больной встречается с врачом или медсестрой, задерганными и переутомленными бесконечными подработками. Администрация же часто обращает на жалобы пациентов гораздо больше внимания, чем на трудности работников.

Как бы банально это ни звучало, но самое главное для предотвращения конфликтных ситуаций — правильное, грамотное и своевременное выполнение своей работы. Помните, что пациент, которого хорошо вылечили, не будет раздувать конфликт, а вот с ухудшением самочувствия предпосылки к развитию конфликта будут усиливаться и обостряться, и тут следует особо отметить важность адекватной симптоматической терапии.

И самое главное — не нужно бояться конфликтов, это нормальная часть взаимодействия людей. Однако если некоторые из них можно предотвратить — лучше сделать это, чтобы облегчить жизнь и себе, и пациентам.

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MORAL AND SPIRITUAL EDUCATION

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ABSTRACT

Morality is a set of decency that is manifested in the attitude of people towards each other, towards the family, towards society. The fulfillment or non-fulfillment of moral requirements in contrast to law is determined by forms of spiritual influence. The place of a person in society is determined not by his material assets, but by his high spiritual image. Our people have a rich heritage of spirituality and culture, education and upbringing, and over the centuries have instilled in the younger generation in every way universal qualities such as humanity, patriotism, friendship, hard work, kindness, Brotherhood and humility.

The article explores the concepts of ethics and spiritual education. Also, in the formation of civil society, opinions are given on ethics and the ethics of moral education.

KEYWORDS: *society, civil society, strategy, education, educational innovation, upbringing, morality, spirituality, moral upbringing, spiritual upbringing.*

INTRODUCTION

Morality plays an important role in the development of mankind. The great thinkers of the East viewed man as one of the important factors in the development of society in order to mature morality, develop it comprehensively, form its spiritual image. Morality can change, develop, fade in a particular society and period. In addition to the specific ethics of each people or nation, there are also universal moral standards. Such moral standards have an effective effect on the overall progress of society. When it comes to human nature, of course, it is emphasized that it is a thinking, intelligent and at the same time a social being. Indeed, let us not take into account what aspects of it, the shortcomings of its qualities(except by biology), they will eventually depend on the mind, thinking, community of man. In turn, the sociability and mind, thinking of a person are inextricably interrelated and complement each other.

In every family, in every neighborhood, first of all, ensuring the health of our young people, giving them a good education, at the same time, reaching adulthood as a worthy person with high moral and ethical qualities has become an important issue from time immemorial. In the years of Independence, these tasks have risen to the level of public policy in Uzbekistan, which has made it possible to achieve high achievements in all spheres.

MAIN PART

After the independence of Uzbekistan, great attention began to be paid to the problems of morality. Islamic values, Oriental rules of conduct, customs, rituals, forgotten in interpersonal relations, began to be a picture again. Our country is building a society based on private ownership, market economy. In such a system, it is natural for different classes and layers of the population to appear. There may be some kind of conflicts, disagreements between them. They are to some extent eliminated with the help of rules of conduct and Islamic values inherent in the peoples of the East and become rich with universal content. Morality and spirituality are inextricably linked.

Currently, attention is paid to the application of interactive methods, innovative technologies, pedagogical and information technologies in the educational process. Therefore, the role of modern teaching methods in the training of qualified professionals at the faculties of higher educational institutions is great. At the same time, special attention should also be paid to the formation of moral and spiritual education in students in the process of teaching. The process of such pedagogical cooperation has its own characteristics, which include not to be indifferent to the student during the lesson.

Awakening thought in the student in the educational process requires great effort and skill from the teacher. Correct thinking means creativity. Therefore, the process of teaching in pedagogy is two-sided: the sum of the educational and teaching activities of the teacher performed by the pupil. Without denying this rule, the content of modern education dictates the harmony of universal and national experiences.

Education is the process of acquiring knowledge from a pedagogical point of view, the formation of qualifications and skills, the main means of preparing a person for life and labor.

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The place of a person in society is determined not by his material assets, but by his high spiritual image. Spirituality serves as a bridge connecting ancestors to generations, the past to today, and the present to the future. It embodies the totality of good qualities, values and traditions accumulated by our ancestors, as well as the historical-social experience and all views accumulated by our ancestors[1].

The life of Man and society is known to consist of three main areas. Therefore, the goal is not achieved if the upbringing is not carried out in a proportional way in all three areas. In addition, it is known that in life the spheres of economy, politics, spirituality do not occur apart, in their pure form, therefore, often in their mutual intersection, essentially complex educational directions can be formed. Due to the fact that the concept of upbringing itself belongs to the field of original spirituality, in this place we focus mainly on the issue of spiritual education, the direction of upbringing, which is aimed at forming the main aspects of personality spirituality.

Spiritual education takes place in two stages. The first stage is aimed at the formation of the main structural aspects of personality spirituality - feelings of faith, science, responsibility, affection, starting with the upbringing of faith[2]. The second stage is the reflection of spirituality in material reality, that is, it is associated with culture, and often consists of complex Educational Directions, which are formed at the intersection of spirituality and economy, spirituality and politics[3].

RESULTS AND DISCUSSIONS

The genesis of socio-cultural technologies in the scientific management of society is the development of science, the rise of human thinking and scientific knowledge. If we look at history, the activities of the owners of high ideas, great personalities are skillfully organized, deeply educated, not only with their morals and manners, but also with a high sense of meaning. Morality is not the same as the others, it is also the saying to respect oneself. In particular, according to our national traditions, the perfection of man can be seen first of all in his moral maturity, in his efforts to deeply study the heritage of ancestors, enrich it, show great respect to them.

It is known from the views of the wise people of our country that attitude to life, morality, justice and spiritual research are built on the philosophy of perfection in society. According to this philosophy, happiness is the only creature that must strive for happiness and goodness and live on the basis of these principles[4]. Because it has the ability to recognize, understand the existence that is different from other creatures, to stand higher than them. The rich spirituality and enlightenment, formed in the East, laid the foundation for development, which caused a sharp turn in the history of mankind in different periods, in different regions.

It should be noted that we can separately admit that young people who do not have enough knowledge, skills, life experience, who are not indifferent to their history, the identity of their ancestors, are naive, unsuspecting today fall into the trap of destructive ideas. At present, as a result of such actions in some parts of the world, one cannot ignore the great spiritual losses, the disruption of national consciousness, as well as religious values and lifestyle.

However, the ideological threat is becoming more and more new because of this, the independent Uzbekistan is now actively working on the formation of national idea and ideology, which is a unifying flag of the nation, society and state, as well as integration into the consciousness of our people[5]. Today, when we observe the radical changes that are happening in our state, today our cities and villages are becoming more and more beautiful day by day. We can also observe a number of changes in the sphere of culture, art, education, science in the regions and remote areas[6]. We can feel that the main goal of the ongoing changes is the high level of confidence and attention of our people to the future. After all, it is permissible to say that the formation and development of the national idea is a demand of modern.

From the first days of Uzbekistan's independence into the lake, a new historical period began, which brought about radical changes in the social, economic and political spheres, as well as in the spiritual, cultural, educational and ideological spheres on the way to building a legally democratic society. At the same time, based on the centuries-old traditions of our people, the humanitarian essence of Islam, our national cadres, the task of creatively using the advanced experience of developed countries, relying on the principles of development chosen by us, restoring the foundations of a free and prosperous and prosperous life, building a legal democratic state, a free civil society was set after all, it is a power - man who drives, implements and develops democracy: democracy does not only become a people's power, it is also the responsibility of every person, every community and the whole people before their country's future, their own destiny.

National self-awareness is one of the most important signs of moral perfection for everyone. After all, it is possible to become a full-fledged person only if he first realizes himself, understands his ethnicity, and inherits the material and spiritual heritage he has left. The prospect of such a nation is great if such people make up the majority of the nation[7]. At the same time, the self-conscious, intelligent, ideologically-politically awakened and united nation and nation, as in the past, were held in colonial chains, undermining their language, culture, values, plundering their wealth, abusing their rights, deprivation of independence is impossible.

Self-awareness means knowing the historical pathway of one’s own nation, who his ancestors were and what they did to the country.

At the same time, any product of development can be used for two purposes - for good and for evil. If we look at the history of humanity and its evolution, we will see that there is an ancient struggle between good and evil ideas and doctrines that promote human perfection and high ideals[8].

Today, the movement in the modern information space is so intensive, so fast that, as before, yes, it is far from us that it cannot be ignored that it has nothing to do with us. It is easy to see that such a nation or nation lags behind hundreds of years of development.

In the present context, globalization has become a powerful tool for ideological influence, serving the interests of various political forces and centers.

Today, young people receive a wide variety of information in educational institutions through radio, television, press and the Internet. The global information space is expanding. In such a situation, one-sided education of young people, telling them what to do, fencing them around with iron walls, does not meet the requirements of the time and our noble goals. After all, we are committed to building an open and free democratic society in our country, and we will never go back.

The future of our state will not be wrapped up in its own crust, but will be built on a profound understanding of universal and democratic values. The future can be achieved through the use of the experience of developed countries, the liberalization of state and public administration, the wider introduction of human rights and freedoms, and the diversity of ideas[9]. It is noteworthy that not only is it involved in information development, developing a common scientific language, but also interacting with other fields as an independent field of scientific knowledge, creating new areas of scientific knowledge - information psychology, information economics, social information.

CONCLUSION

At the intersection of philosophy, informatics, cybernetics, synergetics, sociology and economics, an integrated field of scientific knowledge - information theory of social development is formed. Information is central to this theory. From the point of view of the information economy, the laws of the establishment and development of economic systems are governed by the laws of informatics. Investigation of the new role and place of the person in the information society is the main task of information development.

Therefore, it is necessary to educate young people on a healthy outlook, the priority of trust and national values, the immune system against various threats. Ideological protection is carried out through the system of education and propaganda. Social structures that serve to integrate healthy ideology into the minds and hearts of the people, family, school, neighborhood, state and public organizations also have their place in this process.

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PEDAGOGICAL FORMATION OF SOCIAL ACTIVITY IN STUDENT-YOUTH

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ANNOTATION

It is known that human activity is closely related to the concepts of action, activity, behavior and goes back to the issue of the individual and his consciousness. The personality is formed precisely in the process of various activities, manifests itself. Social activism influences the concentration of thoughts, feelings and actions of people in any area of social reality to assess the life of society and, on this basis, change the relevant aspects of social reality. From the above points, one can say that"social activity " is a criterion that indicates the level of awareness, perfection of an individual from each area. Striving for social faoism is itself an idea.

KEYWORDS: *society, state, civil society, harmonious generation, youth policy, citizen, activity, social activity, tolerance, adaptation.*

INTRODUCTION

In the process of reforming the development of a new society in Uzbekistan, it is important to study the theoretical and practical aspects and experiences of the creation of the foundations of civil society in different countries of the world at different levels and periods. Civil society is a certain social system that guarantees every citizen of this country full freedom to build his economic and political life at his own discretion. Civil society is formed in harmony with the increase in self – awareness of people, their ability to feel a sense of responsibility in the object.

Globalization is the process of increasing interconnection between different countries and regions of the world. The convergence of countries of the world in the socio-economic, political and cultural spheres, the integration of events into one country on the universal scale. It is no wonder now that a lot of money is spent on processing information, delivering it to a designated space, and being the first to deliver it. After all, young people have a perception that it is always right to provide information. This will allow them to disseminate any information they want from their own interests.

Promoting research and innovation in our country, creating effective mechanisms for the implementation of scientific and innovation achievements in a global ethical culture in the image of a global-minded future person: - the formation of such important qualities and qualities as self-education, self-improvement. At the same time, it envisages significant changes in the global community from the principles of ethical culture and the traditional way of life to the modernization of young people. It is important for the individual to feel the importance of individual, self-awareness and self-organization qualities and abilities, worldview and cultural breadth and openness and tolerance, especially for young people. Promoting research and innovation, creating effective mechanisms for the implementation of scientific and innovation achievements occurs when the youth abandons life, cultural and behavioral stereotypes that keep them engaged in professional, political and social progressive processes.

MAIN PART

The real economic facilities and opportunities of society created for a person, legal rights, a settled moral and spiritual environment should be harmonized with the fact that his thinking pursues free, progressive and high ideals. According to our scientists, the approach of young people to social reality on the basis of a new, independent and free thinking has a high performance. Meanwhile, from the point of view of psychologists and sociologists, the development of a newly formed civil society in many ways requires a correction of the consciousness, character and worldview of young people. By now, civil society in our country, the need and responsibility for deciding on a monand system of Public Administration – democracy-has taken the task of further shaping the high spiritual potential of each younger generation, the philosophical way of thinking. In fact, it is necessary for a person to put everything on the scales of reason before solving the tasks in front of him, to predict from the very beginning the likely results of the practical steps he will take. Education plays an incomparable role in elevating youth social culture.

The current stage of development of society and the state requires that scientific and innovative ideas comprehensively increase the overall literacy of the participants in the relationship. To date, the harmonization of education has become an important task. Because, if education is separated from education, that is, to educate young people, and lag behind in applying this knowledge, values such as patriotism, patriotism, responsibility to parents and mahallas will be neglected. That is why we should never forget that encouraging research and innovation, creating effective mechanisms for implementing scientific and innovation achievements requires a great responsibility of young people.

In the study of the content of this article, it is necessary to know the content of the totals of society, civil society, social activity. Between the concept of society and the concept of "civil society", there are not only inseparable, but also very serious differences. The society, which is considered a set of relations between people, becomes a civil society at a stage when its development is in improve, under certain conditions. The category of civil society represents a qualitatively new situation from the point of view of the structure of society and self-government, manifests the alternative of the interests of the state and the individual. In this a person, his rights and freedoms are manifested as a supreme value.

Society is a collection of associations in which all methods of mutual action of people and their interdependence on each other are expressed[1].

The concept of civil society has been manifested in a variety of manifestations over a long period of time, from antiquity to Western enlightenment.

Civil society is a social space in which citizens are provided with active participation in the management of the state and society through relevant civil institutions[2]. The concept of "civil society" is a product of the mentality that mankind has formed for several centuries, and it has been manifested as a criterion of how high the level of provision of human rights and freedoms is. In general, the term "civil society" has a common essence in various foreign literature, but at the same time it is a concept that harmonizes the national traditions of each country.

Social activity in civil society expresses the level of conscious, unselfish analysis of social relations and their desire to change those elements.

Social activity is the participation of social subjects (society, strata, groups and individuals)in socio-political processes, the influence of Labor and cultural and educational activity, the pursuit of full implementation of the rights and duties set forth in the law. Social activity is the main condition for a person to find his place in society and consciously manage his behavior[3].

Civil culture is the conscientious fulfillment of duties and obligations of an individual as an active member of society, along with the possession of certain rights. Formation of social culture in young people - on the basis of giving them knowledge about the features of the structure of an independent state, the role of the country in the international arena, feelings of patriotism and interethnic friendship, social actions carried out on the path of developing the economy of our republic, labor traditions, the idea of national independence and the foundations of ideology, responsibility for fulfilling duties and obligations, it is considered a holistic upbringing process that embodies qualities such as social activity and dedication[4]. Civil society institutions-the strengthening and development of self-governing bodies, non-governmental and public organizations is one of the important conditions for increasing the political and social culture, activity of young people[5].

There are three types of social activity: in the sphere of socio-political processes and culture, labor and living. Labor activity is manifested in the field of labor relations and arises in connection with the professional-social task of the subject. It is recognized as the main, defining type of social activity. Its forms include: austerity, effort for superintendency, participation in scientific and technical creativity, rationalization, ingenuity and other actions. Socio-political processes and activity in the sphere of culture and life are manifested in the socio-political, cultural and educational processes of the individual, in his personal life.

In the event that a person has faced any serious problems of social importance and understands that it is necessary to adopt new laws or to improve the existing laws in order to solve them, the pursuit of social activity becomes more difficult. Social activity of members of society can manifest itself in various forms. By the nature of its manifestation, it is divided into constructive and destructive types. Constructive social activity is the social system in which members of society have these contradictions in conflict with certain contradictions. Seeks to eliminate using legitimate legal programs. It establishes public associations to express its interests, solve problems on the basis of existing laws.

In order to expand the knowledge and worldview of young people, actively support talented students, a number of competitions and sports competitions are regularly held in higher education institutions. All this work is being organized within the framework of the existing systems and mechanisms that have been formed so far[6]. Moreover, the work in the spiritual and educational sphere has not lost its importance in terms of efficiency, influence, modernity.

Nevertheless, in today's age of globalization and rapid information, the role of social networks and the media in the management of the state and society has been sharply activated due to freedom of speech in harmony with the democratic reforms in our country. In such a circuit, the need arose to take the work on the education of young people to a new level. Of course, to work in such a complex situation, to achieve the result, first of all, conditions and highly qualified personnel are needed[7].

The content of social activity, which can be defined as desturoktiv, is different. Such activity is directed against the existing social system, manifested in the desire to destroy it. It arises in a situation where it is believed that with the existing legal programs it is impossible to achieve its goal, solve problems of social significance. In such cases, social activity will not have clear legal limits. And this can lead to a sharpening of the social situation. This type of social activity is observed in periods of instability in social relations.

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In the process of increasing social activity, one should pay attention to the formation of the following social qualities:

1. Science. An educated person is considered to have a lot of knowledge. When you say truly educated, it is said to a person who understands the literal meaning and meaning of things and phenomena, knowing the laws that make up them, passing through their own thinking, testing them in life several times, turning them into skills and abilities. The more knowledge a person has in himself, the more educated he is.

2. National pride is a social quality that serves as an incentive to any process of activity of mankind. A healthy national pride dictates respect for people of other nationalities.

3. Patriotism is a civilized view of national pride, one of the main factors that creates an incentive for the prosperity of Homeland. Patriotism is formed in a concrete life environment, on a social basis and on the basis of existing spiritual and moral values. Both folk and Homeland must be independent in order for its full and correct formation to display high specimens.

4. Courage. If a person has all the qualities listed above, but there is no courage, then no one will benefit from these qualities. Because courage acts as a driving factor for all the positive social qualities of a person. As a result, the feeling of social activity in a person is more strengthened.

Social activity is proportional to social tolerance. Tolerance – this does not mean that the thoughts, views and actions of others are subjected in a non-effective, natural way. Perhaps it represents an active moral advantage and psychological readiness towards understanding, positive cooperation between individual people, different groups, peoples, social groups.

Tolerance serves as the basis for the prevention of destructive actions of young people in relation to other cultures as well as to other thinkers.

In order for the youth of society to be socially active and tolerant, it would be appropriate to ratify the existing international conventions on human rights in the Republic, along with the adoption of laws that ensure the implementation of youth policy, to create and introduce into the minds of all strata of our society and individual persons even more extensive opportunities.

It is necessary to formulate in a person the ability to perceive another person from childhood, in some way, with complexities in his thoughts, nature, culture, views. by absorbing such an idea to young people through education and training, it should mean that people are mutually equal, despite their lifestyle, culture, social origin, material self-esteem, etc.[8]

To be aware, not to remain indifferent to what is happening is the social activity of young people in the current period. This will revive the formation of such characteristics as the upbringing of young people in the spirit of kindness, justice, democracy, the formation of a sense of self – education and development in them, the need for social activity, the correct assessment of information on a wide and varied scale and the development of new areas of knowledge[9]. One of the tasks of modern education is the development of social activity and tolerance among young people.

CONCLUSION

Some young people are faced with difficulties in the sense that they do not understand the opinion of others and do not want to understand. They can not even imagine that a person standing opposite them has his own way of thinking and acting. Often they try to transfer their opinion to others, in addition, they are illiterate in matters of tolerance. Formation of students' tolerance the use of the basic principles of cooperation between the teacher and the students in communication in the course of the lesson gives a good effect.

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THE PROFESSIONAL CULTURE OF THE TEACHER AND ITS SPECIFIC CHARACTERISTICS

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ABSTRACT
A modern teacher uses his experience, knowledge, skills and personal qualities in solving specific problems in teaching students. Many of these problems will need to be addressed when the teacher enters the classroom today. Every teacher solves these problems in accordance with their knowledge and skills.

In the process of reforms for the development of a new society in Uzbekistan, it is important to study the theoretical and practical aspects and experience of creating the foundations of civil society in different countries of the world at different levels and in different periods. Today, the upbringing of a spiritually and physically harmoniously developed generation is an urgent task for us on a national scale. Consistent and decisive continuation of our work on the way to this noble goal is today at the center of our policy.
KEYWORDS: *education, information technology, pedagogy, professional culture, speech, professional skills, abilities.*

INTRODUCTION

The goal of the national training program is to fundamentally reform the education system, create a national system for training highly qualified personnel at the level of developed democracies that meets the highest moral and ethical requirements. The most important and responsible task facing the teachers of our republic is to prepare specialists who will look at the world with a new look, resourceful, able to work, who will build and raise the foundation of our great future.

Our country, which is part of global development, entering a new stage of development, striving to take a place among the leading countries, is trying to find a mechanism to ensure the active participation of each individual in this process and is trying to find ways to improve technical, technological, economic and managerial mechanisms in this process. In these conditions, it is necessary first of all to form a worldview aimed at ensuring the reaction of the individual to the reforms, ensuring the process of their development. In these conditions, there is a need to ensure adaptation to the ongoing processes of members of society as a whole, individual institutions existing in its composition, especially young people and future specialists. Higher education plays an important role in solving such problems, since the process of higher education educates a new cadre entering public life, prepares them as a specialist, forms the foundations of their socialization in society. Higher education forms professional skills of future specialists, increases their positive attitude to national and universal values.

In accordance with the requirements of today's rapidly developing period, many urgent tasks have arisen in connection with the need for a new approach to the content and structure of education in the context of changing modern school education. Now a modern teacher must not only use traditional teaching methods in teaching, but also form and teach them the skills of independent learning and striving to improve their knowledge[1].

It is known that several decades ago society demanded that school education educate good performers, and now it requires the development of free-spirited, creative, responsible, humane, capable of developing independently in the future.

MAIN PART

Therefore, the teacher must have professional skills, be able to use new modern educational technologies that meet modern requirements. In particular, the goal of any science teacher is to form a general and professional culture - to prepare students to become mature, versatile, goal-oriented people who will be in demand in modern society in the future, and to provide modern education.

Everyone who chooses the profession of a teacher takes responsibility for who he teaches and educates[2]. He must take on many responsibilities in order to be eligible to be a teacher, mentor, educator, teacher, responding to his professional training[3].

Innovation is the future. If we start building our great future today, we should start with the same innovative ideas and innovative approaches. ” The genesis of socio-cultural technologies in scientific management of society is the development of

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science, the rise of human thinking and scientific knowledge. The solution of existing problems in the society is related to innovative activities.

It is not a secret that the current processes in Uzbekistan's new stage of development are inevitably accompanied by strong social and political activism, and many view the process as a natural state. This is a natural occurrence that comes with some difficulty in the lives of members of society, especially in the lives of young people whose minds and minds are not fully formed. Since the issues of developing the social and political consciousness of the youth and formation of a new worldview are reflected in the processes of cooperation, solidarity and understanding based on spiritual maturity, prevention of various crises and conflicts. This leads to the evolutionary evolution of development.

At the present stage of society's development, dialectical social cooperation is present in its interaction with higher education, and therefore higher education acts as a cause and consequence of the processes taking place in society. In this regard, it should be noted that, in general, higher education prepares and adapts society to natural and social changes[4]. The main purpose of higher education as an adaptive system in relation to the relations of a person, the state and society is closely interrelated. The realization that higher education is an important value plays an important role in shaping the conditions for the adaptation of society to sustainable development and the effective use of all its scientific and educational opportunities in this process.

The changing society of Uzbekistan at the stage of its development is systematically looking for new values. Under these conditions, the importance of a philosophical approach to the study of the subject increases, since only philosophical observation seeks a scientifically based answer to the difficulties put forward by society. If we make a comparative conclusion about the existing society in developed countries, it becomes clear that fundamental socio-economic changes in the country, that is, the concept of stabilizing society, can be implemented only on the basis of a scientific dialectical project. The peculiarity of the modern educational process in ensuring the flexibility of society is that the process of higher education manifests itself in practice as a special value.

One of the important directions of education system reform is systematic integration of the educational process with information and communication technologies[5]. As a strategic issue, the organization of the educational process and its cardinal renewal of the content, the organization of the pedagogical activity of the teacher in the field of information and communication technologies and the improvement of the education of students[6].

The sphere that forms the social essence of a person in accordance with the needs of society is called the education system, and the person who implements it is called a teacher. The honor of the teaching profession is not only because she is a teacher, a teacher of various knowledge and a qualified teacher, but also because she perfectly knows special disciplines and fundamental sciences, as well as the basics of teaching and education, psychology and pedagogy.

“A teacher is a highly cultured specialist who has deep knowledge of his subject, good knowledge of general and child psychology, and excellent knowledge of teaching methods”[1,35].

The main goal and task of the educational process is to prepare a harmoniously developed, mature person, qualified specialists. Therefore, we need to measure and evaluate the effectiveness of education by the level of knowledge, skills and abilities of students, their willingness to acquire independent knowledge, to find their place in society.

“The teacher is responsible for teaching students. Ibn Sina expressed the following views on what the personality of a teacher should be:

- pay attention to how students master the transferred knowledge;
- the use of various methods and forms in teaching;
- knowledge of the student's memory, the ability to assimilate knowledge, personal characteristics;
- to be interested in science;
- to transfer knowledge in accordance with the age and mental level of students”[2,59].

Concepts such as pedagogical skills, pedagogical experience, pedagogical technology are important in the teaching profession. Also, one of the important tasks of the teacher is the formation of a culture of speech in students, the development of breadth of thinking.

Since time immemorial, attention has been paid to the personal social qualities of teachers, and the requirements for teachers have become more complex and complex, based on the requirements of each age. Research has shown that any teacher should have the following social qualities.

First, the teacher must be well aware of the place of the teaching profession in the life of society, the history of its origin. Because in the process of studying the history of pedagogy, the place of pedagogical activity in human life, the history of the formation of the basic laws and principles of pedagogy is learned.

Secondly, the future teacher must master the general aspects of intellectual activity (thinking, memory, perception, imagination, attention), the culture of behavior, including pedagogical communication.

Third, the teacher must be well versed in philosophy. Because philosophy teaches a person to think abstractly. When a teacher enters the classroom, he loses himself if abstract thinking is not sufficiently developed in him. To grab the attention of your audience, you need to have well-developed abstract thinking.

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Fourth, an educator teaching certain scientific knowledge must also teach the younger generation about ethics and manners. After all, such a task is the duty and responsibility of teachers and teachers.

Fifth, a person engaged in education must have an aesthetic education. It is well known what significance aesthetic education plays in the development of society. It should not be forgotten that aesthetic education is an important and integral part of spiritual education.

In addition to the above social qualities, the professional culture of the teacher and the professional development of the teacher are also important. The professional culture of a teacher is the essence of his professional activity, the essence of the characteristics of his personal quality is systematic education, the professional development of a teacher takes place in the process of vocational education in higher education. At the same time, the professional development of a teacher is inextricably linked with self-education, constant work on oneself, awareness of modern knowledge, as well as timely professional development. All this is an integral part of professional qualities.

The general culture of a teacher reflects the maturity of his socially significant characteristics in the implementation of his professional activity. Culture is the development of a person, the degree of realization of his mental abilities and abilities in practical activity, etc. A person's cultural development is the process through which his knowledge, beliefs, abilities and behavior are developed by the environment.

The professional culture of a teacher consists of systematic education, which is the essence of his personal qualities, within the framework of his professional activity. The level of indicators and the main structural components of the pedagogical culture of the teacher include:

A) the level of intellectual development (primarily the development of pedagogical thinking);
B) complex organization and level of pedagogical activity;
C) the basics of professional pedagogical ethics, morality and etiquette;
G) culture of interaction;
D) the culture of speech;
E) culture of appearance and others.

The culture of pedagogical thinking includes the development of pedagogical analytical and synthesizing abilities, critical struggle in thinking, independence, breadth, dexterity, activity, speed, development of observation, pedagogical memory, etc.

The thinking of the teacher, which is **the culture of pedagogical thinking,** includes three stages of the worldview: the first is the pedagogical beliefs in the methodological worldview. Methodological thinking allows the teacher to look at his professional career and develop a humanistic strategy.

The second stage of pedagogical thinking is a tactical worldview, which allows the teacher to think pedagogically, to materialize the pedagogical process.

The third stage is manifested in the application of general pedagogical laws to sections that are a unique phenomenon of real pedagogical activity. This is quick thinking.

In the structure of pedagogical culture, its ethical faculty plays an important role. This is a process of formation, result and greater self-determination of the process of teacher's pedagogical trust. The teacher needs to be actively involved in the reloxin process from the professional environment, to update their positions[8]. The organizer of pedagogical culture associated with professional activity is characterized by the fact that the teacher has mastered the entire range of his pedagogical abilities, which is a sign of the success of pedagogical activity, prevention of pedagogical errors and, finally, mastering pedagogical skills. Spiritual culture includes moral knowledge that is formed at the theoretical level of mature knowledge. It consists of **professional pedagogical ethics**.

The culture of pedagogical communication is manifested in the ability to hear and hear the interlocutor, ask questions, communicate and understand others, see difficult situations in communication and correctly analyze the state of influence in people, prepare for communication and the desire to communicate.

The most important thing for a teacher is to master the culture of speech. The teacher's speech should be exemplary for students from day to day and contribute to the formation of their speech culture. The grammatical correctness of speech, its lexical richness, well-expressed, figurative, mastery of speech techniques allow the teacher to qualitatively solve various professional problems.

CONCLUSION

In short, the culture of a teacher's outward appearance is assessed by the level of its conformity with the outward appearance and pedagogical activity. The formation of the general and professional culture of the teacher, openness of views, orderliness, politeness, calmness and skillful self-management lead to the success of pedagogical activity. This means that no teacher should make mistakes in the educational process. Because correct parenting requires a lot of responsibility.

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THE LIFE AND SCIENTIFIC TRAVELS OF IMAM ABU DAVID

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ANNOTATION

Many muhaddiths came from Movarounnahr and Khurasan. They made a great contribution to the development of hadith science with their works and activities. One such muhaddith was Abu Dawud Sijistani, who lived in the third century of Hijri. Like other hadith scholars, Abu Dawud went to many cities in search of hadith. He heard knowledge from scholars such as Abu Umar Zarir, Muslim ibn Ibrahim, Ahmad ibn Hanbal, Abdullah ibn Maslama Qanabi, Abdullah ibn Raja', Abu Walid Tayalisi, Ahmad ibn Yunus, Abu Jafar Nufaili, Abu Tawba Halabi, and Sulaiman ibn Harb. He participated in many science circles in Hejaz, Sham, Egypt, Iraq, Jazira, Khorasan.

Among the famous students who studied under him are Imam Tirmidhi, Imam Nasai, Imam Abu Bakr ibn Abu Dawud, Abu Awana, Abu Bishr Dulabi, Ali ibn Hasan ibn Abd, Abu Osama Muhammad ibn Abdul Malik, Abu Said ibn Arabi, Abu Ali Lului, Abu There were great scholars such as Bakr ibn Dosa, Abu Salim Muhammad ibn Said Jaludi, Abu Amr Ahmad ibn Ali.

KEY WORDS: *Hadith, Muhaddis, Sunan, Abu Dawud, Azd, Sijistan, Fath.*

Imam Abu Dawud's name is Sulaiman ibn Ash'as ibn Ishaq al-Azdi al-Sijistani. He is one of the scribes of hadith science, the owner of the work "Sunan", one of the six authentic works. Sijistan is a famous climate in the southern part of Khurasan and is attributed to it. Abu Bakr Abdullah, the author of the famous "Masabih" book, a jurist, scholar, and one of the great hafiz of Baghdad, is also the son of Abu Dawud.

His grandfather, Imran, was one of those executed along with Ali, may Allah be pleased with him, in the Battle of Siffin.[1] Imam Abu Dawud was an Arab and belonged to the Azd tribe of Arabs. Azd was one of the largest tribes of the Arabs. As a result of the collapse of the "Marib Dam" mentioned in the Holy Qur'an, the Azd tribe is forced to move from Yemen. The tribe first spread to the Arabian Peninsula and then spread to other countries after the Islamic conquests.[2]

Birth of Imam Abu Dawud

Imam Abu Dawud was born in Sijistan in 202 AH. His disciple Abu Ubaid Ajurri says: "I heard Sulaiman ibn Ash'as Abu Dawud say: "I was born in 202...".[3]

Imam Abu Dawud was born eight years after Imam Bukhari. Because Imam Bukhari was born in 194. Likewise, Imam Abu Dawud died nineteen years after Imam Bukhari.[4]

Imam Abu Dawud's upbringing and family

Abu Dawud grew up with love for knowledge. His father Ash'as ibn Ishaq was one of those who narrated hadith from Hammad ibn Zayd. His brother Muhammad was also one of the scholars who narrated hadith and traveled to hear hadith. This scientific environment was the main reason for Imam Abu Dawud to take a very early step in science.

They used to write down hadiths from their youth. He had two pockets, one wide and the other narrow. He said to him, "May God have mercy on you, what is this?" When asked, he replied: "For the old books, we don't need another one."

Imam's Family

Imam Abu Dawud was married. He also had a servant. He also had a son named Abdullah. He took the name of Abu Bakr. His son was also one of the famous hadith scribes.

[1] Ibn Asakir. Historical city of Dimashq. - J. 22. -B. 203. Imam Mizzi. Tahzibul Kamal. - J. 11. -B. 356.
[2] Muhammad ibn Ali ibn Husayn Hariri. Qabilati Azd min fajri Islam ila kiamid davatis suudiyal ula.
[3] Imam Ojurri. Sualatu Abu Ubayd Ojurri Aba Dawood. 1898. - J. 2. -B. 294.
[4] Imam Sakhovi. Bazlul majhud. - J. 1. – B. 78.

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His brother Muhammad ibn Ashas was a little older than Imam Abu Dawud and accompanied him on his travels of knowledge. Imam Zahabi, may God have mercy on him, mentioned this.[5]

Studying the Science of hadith

He was influenced by Imam Bukhari, he was one of his students. They followed the path of that person in science. This person was similar to Imam Ahmad ibn Hanbal, may God's mercy be upon him, in guidance, signs and appearance. Some people said about this person: "Abu Dawud is similar to Ahmad ibn Hanbal in terms of guidance, evidence, and appearance, Ahmad ibn Hanbal is similar to Waki in this regard, Waki is similar to Sufyan in this respect, and Sufyan is similar to Mansur, Mansur is similar to Ibrahim, Ibrahim Alqama, Alqama is similar to Abdullah ibn Masud." Alqama says: "Ibn Masud is like the Prophet, may God bless him and grant him peace, in guidance and evidence".

Ibn Halikon said about Abu Dawud: "He was at the highest level in Sunnah and ability."

Abu Dawud, may Allah bless him and grant him peace, went to many cities in search of hadith, like other scholars of hadith. During these trips, he met many great scholars and hafiz. He heard knowledge from scholars such as Abu Umar Zarir, Muslim ibn Ibrahim, Ahmad ibn Hanbal, Abdullah ibn Maslama Qanabi, Abdullah ibn Raja', Abu Walid Tayalisi, Ahmad ibn Yunus, Abu Jafar Nufaili, Abu Tawba Halabi, and Sulaiman ibn Harb. He participated in many science circles in Hejaz, Sham, Egypt, Iraq, Jazira, Khorasan.

Abu Dawud, may Allah bless him and grant him peace, sacrificed his life for the science of hadith. He produced many disciples along the way. Among the famous students who studied under him are Imam Tirmidhi, Imam Nasai, Imam Abu Bakr ibn Abu Dawud, Abu Awana, Abu Bishr Dulabi, Ali ibn Hasan ibn Abd, Abu Osama Muhammad ibn Abdul Malik, Abu Said ibn Arabi, Abu Ali Lului, Abu There were great scholars such as Bakr ibn Dosa, Abu Salim Muhammad ibn Said Jaludi, Abu Amr Ahmad ibn Ali. From Abu Dawud, his shaykh, Imam Ahmed ibn Hanbal, recorded the hadith of Atiira. He narrated this hadith from Abulbashar Dorimi, who narrated it from his father. The Messenger of Allah, peace and blessings be upon him, was asked about Atiyrah. He considered her beautiful. Ibn Abu Dawud said: "My father said: "I narrated this hadith to Ahmad ibn Hanbal, he approved it and said: "This hadith is strange." Then he said to me: "Sit down", took out paper, pen and inkwell and said: "Tell me", he wrote it down from me. Then, when I saw him the other day, Jafar ibn Abu Samina came to him. Ahmad ibn Hanbal said to him: "O Abu Jafar, there is a strange hadith in Abu Dawood. Take a note from him," he said. Then he asked me. I told him."

Atiyrah is an animal slaughtered in the month of Rajab, and it was practiced in Jahiliyyah, but it was abrogated when Islam came...."

Imam's Death

After a hard and toilsome life, Imam Abu Dawud faced death. He died on Friday, the fourteenth of Shawwal, 275.

After he tried hard to follow the Sunnah, he bequeathed it to be washed by Hasan ibn Musanna after he died on his deathbed. Because Hasan was the leader in this science. Imam Abu Dawud said: "If he agrees, let Hasan wash." If not, look at the book of Sulaiman ibn Harb, narrated by Hammad ibn Zayd, and learn from it how to wash a dead body.

What Imam Abu Dawud bequeathed happened. Ibn Musanna washed the corpse after the Friday prayer. Abbas bin Abdulwahid bin Jafar bin Sulaiman Hashimi recited the funeral prayer of Abu Dawud. They buried him near the grave of Imam Sufyan Sayri.[6]

Scientific trips of Imam Abu Dawood.

Abu Dawud is the owner of many scientific trips. Khatib al-Baghdadi and the Mizzis said: Imam Abu Dawud is one of the people who traveled a lot, traveled the world, collected hadiths, and wrote works. He wrote hadiths from Iraqis, Khurasanians, Syrians, Egyptians and Algerians.[7]

Imam Zahabi: Abu Dawud made rihilats, compiled hadiths, wrote many works and was very skilled in these things.[8]

Imam Hakim: Imam Abu Dawud was born in Sijistan. According to the hadith, he went to Basra from Sijistan and lived there. There, he heard many hadiths from Sulaiman ibn Harb, Abu Numan and Abul Walid, and then entered Syria and Mirs. Then he went to other sheikhs with his son. After that he came to Naisabur. There, he narrated hadiths from Ishaq ibn Mansur to his son. Then he returned to Sijiston. Then he went to Basra and lived.[9]

[5] Shamsiddin Zahabi. Siyaru alamin nubala. -J. 13. -B. 221.
[6] Ibn Jawzi. Al-Muntazam. -J. 7. -B. 217. Ibn Kathir. Al-Bidaya is finally. -J. 14. -B. 617.
[7] Khatib Baghdadi. History of Baghdad. -J. 9. -B. 55. Imam Mizzi. Tahzibul Kamal. -J. 11. -B. 356.
[8] Shamsiddin Zahabi. Siyaru alamin nubala. -J. 13. -B. 204.
[9] Shamsiddin Zahabi. Siyaru alamin nubala. -J. 13. -B. 217.

Imam Hakim: Imam Abu Dawud was undoubtedly the Imam of the people of Hadith in his age. He heard hadith in the cities of Egypt, Hijaz, Sham, Iraq and Khurasan. He wrote a hadith from Baghlan in Khurasan and a hadith from Ibrahim ibn Musa in Raya before he traveled to Iraq.[10]

Imam Sakhovi: "Imam Abu Dawud made scientific trips to cities. He was 18 years old when he came to Baghdad from his hometown. Abu Dawud: "I performed the funeral prayer for Affan in Baghdad in 220. Affon's death was at the end of Rabi'ul Akhir in that year. In the month of Rajab 220, Uthman Al-Muazzin[11] went to Basra on the morning of his death. Abu Amr died in the month of Sha'ban. He went to Kufa in 220 and also visited Dimash in the same year.[12]

His travels in the cities of Khorasan:

It was mentioned above by Imam Hakim that Imam Abu Dawud started his journeys from the cities close to him. First of all, he received hadith from the scholars of Khurasan, and then he traveled to other places. The fact that Imam Abu Dawud heard a hadith from the scholars of his town is something that the Imams bequeathed. Khatib al-Baghdadi said: "If a seeker of knowledge wants to go on a journey of knowledge, he should learn hadith from them without leaving any scholar in his city." then Khatib al-Baghdadi provided evidence for this statement.

Imam Hokim said: "Imam Abu Dawud's previous trips were to the cities of Khurasan. At that time he was 18 years old. Imam Abu Dawud returned to Khurasan many times after his trips to other cities.

Herat is another one of the cities that Imam Abu Dawud visited:[13]

Ahmad ibn Muhammad Haravi mentioned it in "History of Herat". Herat was one of the most important scientific centers in the Islamic world. Herat is a city near Sijistan. Therefore, Abu Dawud started his journey from there and learned from the sheikhs there. Some say that Abu Dawud lived in Herat before his previous journey to Basra.[14]

Baghlan:[15]

Abu Dawud traveled to Baghlan, where he heard hadith from Qutayba bin Said Baghlani and others.

Ray:[16]

Abu Dawud's journey to Ray was before the age of 18, where Ibrahim ibn Musa [17] heard a hadith from others.

Naisabur:[18]

In the book of Imam Hakim Tarikhi Naisabur: Abu Dawud narrated that he heard hadith from many scholars of Naisabur, among them Ishaq bin Rohuwiya (died 238 Hijri). The son of Abu Dawud said: "Abu Dawud attended the funeral of Abu Bakr Ishaq ibn Rahuwiyyah." Abu Dawud traveled with his son. This means that Abu Dawud was in Naisabur at that time. This is a different journey from Abu Dawud's previous journey (in 220).

Asbahan:[19]

Abu Nuaym Asbahani said this in book "Zikru Akhbari Asbahan"[20] .

His travels in places other than Khurasan and Sijistan:

Baghdad:

This is the first city that Imam Abu Dawud visited other than Sijistan and Khurasan. In Baghdad in 220, Affan ibn Muslim led the funeral prayer for Saffar Basri. Affon's death was at the end of Rabi'ul Akhira in the same year. Abu Dawud left this city in the month of Rajab. During this trip, he stayed in Baghdad for two months and a few days. Scholars say that Abu Dawud visited Baghdad many times. Khatib al-Baghdadi said the following in his biography of Abu Dawud: "Abu Dawud came to Baghdad many times. He narrated "Sunan" in Baghdad. The people of Baghdad narrated hadiths from him. The fact that Imam Ahmad, Ibn Ma'in and Ibn Madini are considered as a long time is proof of this. He narrated many hadiths from them. He also learned jarh and tadil from them. The fact that Imam Abu Dawud told Imam Ahmad about the death of Musaddad ibn Musharhad also proves this. Musaddad died in 228 Hijri. Abu Dawud was in Baghdad in 271, then went to Basra.[21].

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[10] Ibn Asakir. Historical city of Dimashq. - J. 22. -B. 193.
[11] Uthman ibn Haysam ibn Jahm Abdi Basri Muazzin (220) was a Sikh narrator from the Rijals of Taqrib..
[12] This is not true. maybe he went in 222.
[13] A famous city in Afghanistan, located in the northwest of Afghanistan, on the border with Iran.
[14] Ibn Asakir. Historical city of Dimashq. - J. 22. -B. 196.
[15] A famous city in the north of Afghanistan.
[16] One of the cities of Khorasan.
[17] Abu Ishaq (220) is a Sikh, a Hafiz man.
[18] One of the cities of Khorasan. Zahabi called Naisabur the land of circumcision.
[19] One of the cities of Iran. It is located 700 km south of the capital of Iran.
[20] Abu Nuaym Asbahani. Zikru News Asbahan. -J. 1. -B. 334.
[21] Khatib Baghdadi. History of Baghdad. -J. 9. -B. 58.

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Basra:

He died in the month of Rajab that year. Abu Dawud heard hadiths from Abu Amr Dorir in one sitting. In that year, he also heard hadith from Amr ibn Ali Fallas [22] (died 249 AH) and others. He was in Basra that year. He said that he also wrote hadiths from Bundar and Abu Musa. Abu Dawud visited Basra several times. He attended the funeral of Muhammad ibn Kasir, who died in 223 Hijri. He met Hafs ibn Amr Hawzi, who died in 225 Hijri, in Basra.

Kufa:

Abu Dawud went to Kufa in 221 AH. Abu Dawud himself said this clearly. But he did not live there long. Because he returned to Hijaz that year. Abu Dawud visited Kufa many times. Because there were many teachers in Kufa. Abu Dawud heard a hadith from Haysam bin Khalid Juhani[23] in 235 AH.

Makkah Mukarrama:

Imam Abu Dawud left Kufa for Hijaz. There, Abdullah bin Maslama heard a hadith from Qanabi in 221 Hijri.[24]

Medina Munawwara:

Although there is no clear information about Abu Dawud's trip to Medina, it is clear that he went there. His narrations about the Buzoa well testify to this. Abu Dawud measured Buzoa's well with his cloak. It is possible that he went to Madinah immediately after his trip to Makkah. Such was the habit of the pilgrims. Because they used to get a lot of benefits from going to Madinah on Hajj and praying at Masjid Nabawi.

Damascus:

Imam Abu Dawud Abu Nazr said about Ishaq ibn Ibrahim Dimashqi: "I did not see anyone like him in Dimashq." He was crying a lot. He said that he wrote a hadith from him in 222 Hijri [25]. This indicates that he left Hijaz for Damascus suddenly. He was in Damascus in 222. Ibn Asokir wrote a biography of Abu Dawud in Tarikhu madinati Dimashq and mentioned 80 sheikhs in Dimashq. Then, "Another group said that they heard from the sheikhs.".[26]

Hymns:

Abu Dawud often went to the city of Hims. He said that Muhammad ibn Ismail Himsi visited Hims several times during his lifetime. Imam Abu Dawud's entry into Hims preceded his return to Iraq the following year. These two cities are close to each other. His two teachers who lived in Hims were Hayva ibn Shurayh ibn Yazid Hazrami Himsi[27] and Yazid ibn Abd Zubaydi Himsi [28] he died in 224 Hijri. He returned to Iraq in 223 Hijri.

Halab:

Abu Dawud heard a hadith in Halab from Tawba Robe ibn Nafe' Halabi (died 241).[29]

Ҳarron:

Abu Dawud heard hadith there from Ahmad ibn Abu Shuayb and others.[30]

Jazirah:[31]

Abu Dawud wrote a hadith in Jazira from Abu Ja'far Nufaili and others.[32]

list of used literature

1. *Ibn Asakir. Historical city of Dimashq. - J. 22. -B. 203.*
2. *Imam Mizzi. Tahzibul Kamal. - J. 11. -B. 356.*
3. *Imam Sakhovi. Bazlul majhud. - J. 1. – B. 78.*
4. *Imam Ojurri. Sualatu Abu Ubayd Ojurri Aba Dawood. 1898. - J. 2. -B. 294.*
5. *Ibn Jawzi. Al-Muntazam. -J. 7. -B. 217.*
6. *Ibn Kathir. Al-Bidaya is finally. -J. 14. -B. 617.*
7. *Muhammad ibn Ali ibn Husayn Hariri. Qabilati al-Azd min fajri al-Islam ila qiyamid davatis suudiya al-uulo.*
8. *Khatib Baghdadi. History of Baghdad. -J. 9. -B. 55 56.*
9. *Khatib Baghdadi. Al-Jome' li-aqlaqi ar-rawi and adobi as-some' -J. 2. -B. 335.*
10. *Shamsiddin Zahabi. History of Islam. -J. 6. -B. 551.*
11. *Shamsiddin Zahabi. Siyaru alamin nubala. -J. 13. -B. 221.*

[22] Hafs ibn Amr Dorir Basri.
[23] Haysam ibn Khalid Abu Hasan Kufi (died 239 Hijri).
[24] Shamsiddin Zahabi. Siyaru alamin nubala. -J. 13. -B. 204.
[25] Sualatu Abu Ubayd Ojurri Aba Dawud, 2/225.
[26] Sualatu Abu Ubayd Ojurri Aba Dawud 2/225.
[27] Sikh narrator.
[28] It was called Georgian. Sikh narrator.
[29] Shamsiddin Zahabi. Siyaru alamin nubala. -J. 13. -B. 204.
[30] Shamsiddin Zahabi. History of Islam. -J. 6. -B. 551.
[31] It is used in two different senses, one of the cities between the Tigris and the Euphrates, and the other of Ibn Umar's Island. The former is meant here.
[32] Shamsiddin Zahabi. History of Islam. -J. 6. -B. 551.