ISSN:2455-7838 (Online)
DOI : 10.36713/epra2016

SJIF Impact Factor(2022) : 8.197 ISI I.F Value : 1.241

EPRA International Journal of

RESEARCH & DEVELOPMENT

(IJRD)

Monthly, Peer Reviewed (Refereed) & Indexed International Journal

Volume - 8 Issue - 1 January 2023

RESEARCH & DEVELOPMENT

ISSN (Online): 2455-7838
SJIF Impact Factor (2022):8.197
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EPRA International Journal of

Research & Development

(IJRD)

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Volume: 8, Issue:1, January 2023

Indexed By:

Published By
EPRA Publishing

SJIF Impact Factor 2021: 8.013| ISI I.F.Value:1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8| Issue: 1 | January 2023 - Peer Reviewed Journal

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

A NEW APPROACH IN THE TREATMENT OF BOILER WATER

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ABSTRACT
The quality of boiler water is an essential part of increasing boiler efficiency. Nevertheless, the most frequent type of failure is the corrosion of the boiler tubes due to improper treatment of feed water. Also, it can affect its performance, life, and cost of maintenance, risking boiler efficiency, making the treatment of the boiler water a key in the marine industry. Thus, the boiler water should be treated chemically or mechanically to maintain the proper boiler operation. This report will guide you through the problems and solutions for boiler water treatment.
KEYWORDS: *Water Treatment, Boiler, Hot Water, Scale Transformation, Corrosion*

1. INTRODUCTION

A boiler is a closed vessel in which fluid (mostly water) is transformed into high-pressure steam by getting heated. Boilers are a very important system in the ship's engine room. Their main purpose is to provide the steam needed for various systems in the vessel. Because their use is essential for the ship, the importance of correct water treatment for economic operation and for extending the life of boiler and equipment cannot be over-emphasized. To ensure that the boiler will work properly boiler water is always tested and treated at regular intervals, externally and internally. External water treatment refers to the reduction or removal of impurities from water outside the boiler by chemical or mechanical treatment of the water source. The purpose is to improve the quality of the water prior to its use as boiler feed water. There are many types of external water treatments (softening, clarification, filtration, de-alkalization, dearation, de-mineralization, membrane contractors, etc.). These methods can be used to prepare make feedwater for a boiler. Even if all these methods are applied for the external treatment of the water, boiler feedwater still contains impurities that could inevitably affect boiler operation. This treatment is usually in the form of chemical dosage that is applied in the feedwater and its purpose is to minimize the potential problems and prevent any fatal failures. Its primary affects are mostly scale and corrosion. Boiler feedwater may contain a variety of impurities that's why it's essential to treat it thus avoiding damage to the boiler tubes and shell. A successful water treatment approach can be taken by following these steps [1]:

- Prepare the boiler water before it goes to the boiler.
- Maximize the potential of condensate.
- Provide internal boiler protection.
- Maintain clean internal boiler surfaces.
- Avoid problems and shutdowns.
- Extend equipment life.

2. PROBLEMS OF BOILER WATER

All raw water meant to be used for boiler operation contains various types and amounts of impurities. This water is divided into four main types. These are make-up water, feed water, blow down water, and condensate water. *Makeup water*- The softened water, raw water, or demineralized water which is needed for steam generation. This water is used in many rocedures in heating applications, because of its good heat transfer capacity.

Condensate water- After steam transfers its heat to the process, it returns to a liquid state called condensate. Condensate water is known for its purity and its ability to be reproduced into steam again without the use of any additional chemical treatments. *Blow down water*- The water that is drained because of the need to limit the impurities to an acceptable level. Because of the water loss makeup water is added. *Feed water*- The combination of total condensate returns and boiler makeup water that is aggregated and supplied to the boiler to create new steam. Some of the common impurities of the water before it goes through external treatment can be summarized below [1] [2] [3]:

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Table 1: Some Impurities of the Water

Dissolved solids	These are substances that will dissolve in water divided into two major categories. Substances which are non scale forming and substances that form scales when heated which are the most important ones (carbonates and sulphates of calcium and magnesium).
Dissolved gases	The gases that can be dissolved by water. Oxygen and carbon dioxide. These gasses are aggressive instigators of corrosion.
Color	The cause of this is mostly decayed organic matter changing the color from colorless to deep brown.
Cations	Positively charged ions such as magnesium, sodium, calcium, and potassium.
Alkalinity	Carbonate, hydrate, and Bicarbonate measured by titration. Alkalinity can convert to carbon dioxide in steam form causing corrosion
Hardness	Calcium and magnesium salts which are the main causes of scale formation.
Turbidity	Finely suspended matter which doesn't settle. Imparts and cloudy appearance to the water.
Silica	Normally exists in water as an anion or as a colloidal suspension.
Suspended Solids	Substances that exist in water as particles, they usually are minerals or organic matter.These kinds of particles can cause turbidity and can block tubes.
Anions	Negatively charged ions such as alkalinity, sulphate, chloride, and nitrate.

3. PROBLEMS OF BOILER OPERATION CAUSED BY IMPROPER FEEDWATER TREATMENT

Proper feedwater treatment is a major factor in the boiler's proper operation. The common problems that we face due to improper treatment of feedwater can be summarized below [1].

- Alkalinity and pH of the water
- Oxygen Content
- Hardness
- Scale deposits
- Boiler water carryover

3.1 Alkalinity and pH of the water

The pH scale ranges from 0 to 14. When at 0 the water is at its most acidic state and when at 14 is at its most alkaline state with number 7 on the scale being neutral. Control of pH is of outmost importance in many boiler water treatment programs because of corrosion and scale problems. During boiler operation the pH of the water must be in the range between 9.5 to 11.5 to ensure the proper reaction between the calcium and magnesium ions and phosphate molecules. In most cases if the pH drops below the recommended range the chances for corrosion increase while above this range the chances for scale formation increase. In addition, acids and alkalis can increase the conductivity of the water. For example, a sample of water with a pH of 12 has a higher conductivity than a sample of a pH value of 7.

Alkalinity on the other hand is the measurement of the carbonate, bicarbonate, and hydroxyl ions in the water, only the former two are found in natural water supplies. In boiler feedwater exists two forms of alkalinity. Carbonate and bicarbonate the latter is the most common. The combination of carbonate and bicarbonate together with calcium and magnesium can cause scale in the boiler water systems. When water with carbonate or bicarbonate alkalinity is heated the alkalinity transforms into carbon dioxide. The carbon dioxide released combines with the water and forms carbonic acid which can cause corrosion. In addition, calcium carbonate scale can be formed by the reaction of the corrosion products in combination with the alkalinity.

3.2 Oxygen Content

Dissolved oxygen is the most common type of corrosion inside the boiler water system. Even the smallest amounts of dissolved oxygen can cause severe damage. The presence of oxygen results in the formation of hematite or red iron oxide which as a result leads to pitting corrosion which can cause tube failure. The amount of oxygen present in the system is dependent on the feedwater temperature, the lower the temperature the higher amount of oxygen present and vice-versa. At higher temperatures dissolved oxygen causes faster corrosion on the internal surface of the boiler. Dissolved oxygen can cause damage to the steam drums, mud drums, boiler headers, and condensate piping.

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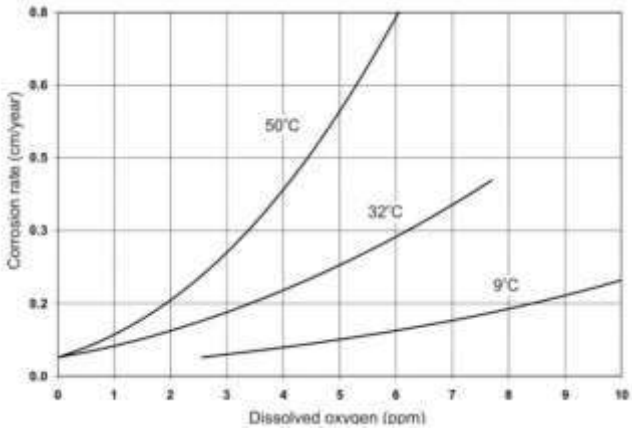

Fig. 1 Effect of oxygen concentration on the corrosion of steel at different temperatures.

3.3 Hardness

Water as a substance is referred to as hard or soft. Soft water contains little to no impurities while hard water contains various scale forming impurities. The primary minerals responsible for scale formation are calcium and magnesium. The sum of these two is the result of the total hardness. Total hardness is divided into carbonate or temporary hardness and non-carbonate or permanent hardness. Carbonate hardness is caused by carbonates and bicarbonates ions like calcium and magnesium that dissolve in water and form an alkaline solution which when heated it decomposes and releases carbon dioxide and soft scale. Noncarbonate hardness is also caused by the presence of carbonates and bicarbonates ions like calcium and magnesium but in the form of Sulphates and chlorides. As the temperature rises these salts due to their reduced solubility, they precipitate from the solution to form a hard scale which is very hard to remove. In addition, the presence of silica in the boiler water can also lead in hard scale. This scale can react with the existing salts, calcium and magnesium to form silicates which can inhibit heat transfer across the fire tubes and cause them to overheat.

3.4 Scale deposits

'Scale' is the result of water impurities such as calcium, magnesium and silica, found in water supplies. These impurities precipitate at high temperatures and form a dense coating of material on the waterside of the boiler tubes. This dense layer acts as an insulator, lowering the efficiency of the heat transfer in the boiler system thus increasing the fuel consumption. Fuel wasted because of scale varies from 2% for water-tube boilers up to 5% for fire-tube boilers. Scale typically has a thermal conductivity of an order of magnitude less than the corresponding value for bare steel. That's why even thin layer of scale act as insulators effecting heat transfer. In addition, to its high insulating values scale narrows pipe internal diameters over time effecting the proper flow of water. Another important problem is that scale also causes the tube's metal temperature to rise, which increases the flue gas temperature resulting in tube failure from overheating.

Scale Thickness, inches	Fuel Loss, % of Total Use		
	Scale Type		
	"Normal"	High Iron	Iron Plus Silica
1/64	1.0	1.6	3.5
1/32	2.0	3.1	7.0
3/64	3.0	4.7	–
1/16	3.9	6.2	–

Fig 2 Energy loss due to scale deposits.

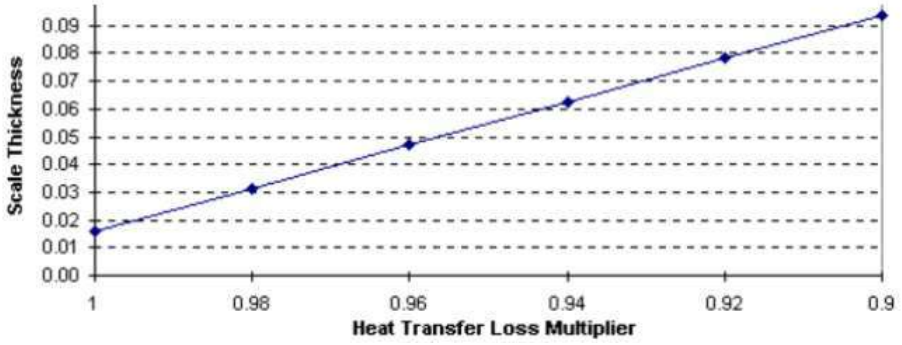

Fig 3 Effect of scale thickness on heat transfer.

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3.5 Boiler water carryover

This describes the contamination of steam caused by a relatively small quantity of boiler water solids. The carryover of droplets of water in the steam by foam or mist is called Priming. This can occur by sudden fluctuation in steam demand or excessive ratings. As a result, priming lowers the efficiency of the steam energy and creates crystal salts on the super heaters and in the turbines. Excessive boiler water carryover creates turbine blade deposits because of the steam carried solids in the boiler system. Priming relates to the viscosity of the water and its tendency to foam. These properties are controlled by the salinity, alkalinity and certain organic substances. Another type of boiler water carryover is foaming. Foaming is the formation of bubbles on the boiler water surface that pass out with the steam. It is caused by a relatively high concertation of boiler water solids. Substances like grease, oil, fats, alkalis, and suspended solids are especially conductive to foaming. In theory suspended solids collect on the outer layer of the steam bubble making it tougher, thus the steam bubble builds up foam. The finer the suspended particles the greater their collection in the bubble[6].

4. BOILER WATER TREATMENT METHODS

The treatment of the boiler water plays a very important factor in the boiler's proper operation. To achieve it we can take several approaches in the treatment of the boiler water. These approaches can be summarized below [2] [3] [5]:

- Makeup water treatment
- Recovered condensate water and treatment
- Blowdown water
- Feed water treatment and conditioning chemicals

4.1 Makeup water treatment

Makeup water contains the larger amount of impurities because it comes from natural sources, because of the variety of samples that we can find in nature we can't treat it with only a single method. One method is water softener, its purpose is to remove the hardness from the boiler makeup water without changing the pH or alkalinity. The softening media is called zeolite, in its composition inherits negatively charged ions which attract the positive ions from the water. As the water passes through the zeolite the calcium and magnesium salts are attached to the beads. During this process an exchange occurs in the zeolite heads, trading sodium for calcium and magnesium. As a result, the sodium with the 'soft' ions take the place of the calcium and magnesium 'hard' ions in the water producing 'soft' water.

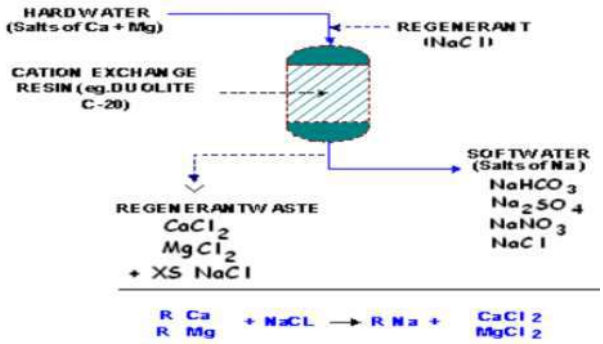

Fig 4 *Water softening scheme.*

Another method is de-alkalization by ion exchange. There are two types of de-alkalization split-stream and chloride. Splitstream de-alkalization implements two parallel cation exchange units of sodium zeolite. One is regenerated with salt and the other with acid. Makeup water passes through the first zeolite exchanging calcium and magnesium for sodium and the remainder passes through the acidified zeolite to remove hardness and alkalinity. These two flows then connect and pass through the aerator or de-carbonator. Because of the reaction that will take place during the connection of these two flows carbon dioxide and water will be produced. With this method we can achieve nearly zero levels of hardness in the water with the cost of alkalinity reduction.

Chloride de-alkalization use two ion exchange units operated in series regenerated with salt. The first is a zeolite softener containing cation resin and the second is a de-alkalization unit containing anion resin. The zeolite softener to remove hardness and the anion unit to exchange bicarbonate and sulphate for chloride. This process does not remove dissolved solids, but it removes nearly all alkalinity for that reason caustic soda is added to obtain the necessary hydroxide alkalinity in the boiler water.

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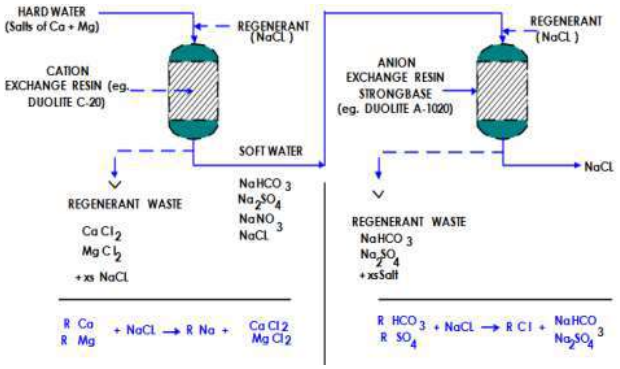

Fig 5 De-alkalization scheme.

De-mineralization by ion exchange is another treatment method. This process will remove the largest amount of salts from the water achieving a quality close to that of distilled water. Its mainly used where total dissolved solids (conductivity) is the limiting feedwater constituent. By using this method, the water goes through cation and anion exchange resins. It uses cation exchanger in the hydrogen form to exchange them for the positive charged ions from the water. The discharge from that unit then passes from the anion exchange resin and exchanges hydroxide ions for the ions in the water. This resin might be either a weak or a strong base resin. A weak base resin absorbs the entire acid molecule and not just the chloride ion. This process is an acid-base reaction.

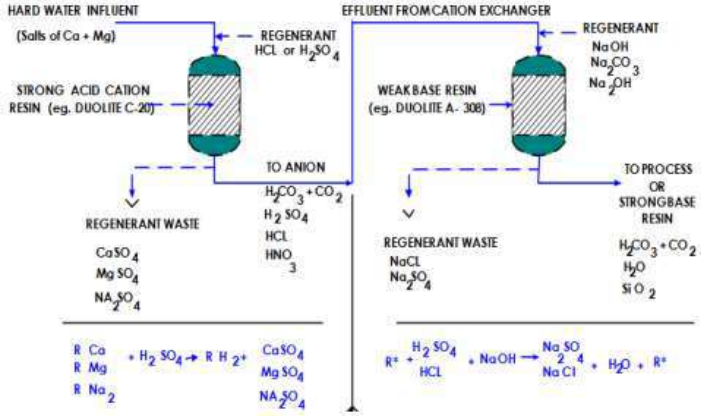

Fig 6 De-mineralization scheme.

One more method of water treatment is reverse osmosis plant. Reverse osmosis is the process of water purification by placing a semi-permeable membrane and letting water pass through it. This process can remove high concentrations of impurities rom the water such as ions, salts, and large particles to a lower concentration of them. This can happen by applying pressure between 400-2000 psig on the high concentration side of the membrane. This is an efficient and cheap method to produce high quality water.

4.2 Recovered condensate water and treatment

Condensate water has a very low concentration of dissolved solids thus it adds very few impurities to the boiler feedwater, most of the impurities in the feedwater come from the makeup water. The recovery of condensate water is important for the following two reasons. First, the more condensate is recovered the less the makeup water that we'll need to fill the boiler. So, we can minimize the contaminants that will go in the boiler system from the usage of makeup water. In return the water will need less treatment, external or internal. Second, we'll have less condensate discharge if we recover a percentage of it. This in return, will lower the blowdown water quantities. To top it off, condensate water is hotter than makeup water so losing it will cost us the heat that is equivalent to the temperature differential of the makeup water. If condensate gets contaminated it must be segregated from the pure steam otherwise it will lead to bigger and more serious problems. Condensate is generally very pure water but in certain cases it can be corrosive because it contains dissolved carbon dioxide which can dissolved and suspended iron to the feedwater. To prevent this, we can use neutralizing amines which are chemicals called morpholine and cyclohexylamine to break down carbonic acid and increase the pH of the condensate.

Another way is to use oxygen scavengers or filming amine which can scavenge oxygen and provide a coating to the ondensate system or provide a watertight barrier against carbonic acid and oxygen.

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4.3 Blowdown water

De-mineralization treatment isn't perfect there always exist a small amount of dissolved minerals in the boiler feedwater. The addition of dosing chemicals, makeup water in the boiler and the evaporation of it increases the concentration of these inerals and leads to accumulated solids in dissolved or suspended form. These solids promote carryover increasing the moisture level of the steam and damaging pipes, valves, and other equipment. Also, suspended solids cause sludge or sediment in the boiler that can directly affect heat transfer capabilities of the pressure vessel and lead to various problems like pressure vessel damage. To summarize everything these solids will form a sludge or sediment at the bottom of the boiler that need to be removed by the blowdown process to maintain the recommended values of dissolved solids in the system. This process has an indirect effect on the boiler water treatment because regulating and reducing the blowdown will reduce the amount of makeup water added to the system.

4.4 Feed water treatment and conditioning chemicals

Even after external treatment of the water we cannot get rid of all the impurities that will go in the boiler system, thus we need to treat the water internally. The objective of the internal treatment is to remove specific impurities that are present, prevent corrosion by maintaining chemical balance to remove oxygen, carbon dioxide and traces of other dissolved gases. The use of certain chemicals like sodium phosphate to prevent scale formation from the hardness of the water. This hardness precipitates at the bottom of the boiler where it can be blown down. Additionally, internal treatment allows as to control individual parameters of the water such as alkalinity, pH, sulfite, dispersant, condensate, and others by using certain chemical formulations. These formulations can change corrosion/scale salts to soft mobile sludges. Also, sludge conditioners can be used to keep these sludges into suspension and prevent them from depositing on metal surfaces. After the use of these chemicals the TDS in the boiler water will increases and we'll have a higher rate of blowdown. Feedwater can also be treated by a method called de-aeration. Mechanical de-aerators and eliminate oxygen, free carbon dioxide (while it is released with the steam) and other corrosive gases from the feedwater. There are two types of de-aerators, tray-type and spray-type. Trayheaters reduce the water into droplets and collect it over a several rows of trays by using dissolved gases. These droplets come in contact with the steam and they get heated thus removing all oxygen. Spray-type heaters use spring-loaded nozzles placed at the top of the unit and the spray the water into the steam. Because of the high solubility of the water and the levated temperatures oxygen is removed by the system.

5. CONCLUSION

Choosing the correct treatment method and chemical dosages depend on the water sample and its impurities and the condition of the boiler system. To achieve a proper boiler operation, we must maintain the pH, TDS, and alkalinity of the water to certain levels to limit corrosion and scale formation. The removal of dissolved solids (magnesium, calcium, etc.), dissolved gases (oxygen, carbon dioxide, etc.), and various salts from the feedwater is also very important. All these solids and gases will end up to the bottom of the boiler forming a sludge, to be removed by the blowdown process. Makeup water contains the largest percentage of impurities that's why it's quantity's must be minimized as much as possible. This can happen by getting more condensate recovered because it is a high-quality water and regulate the blowdown.

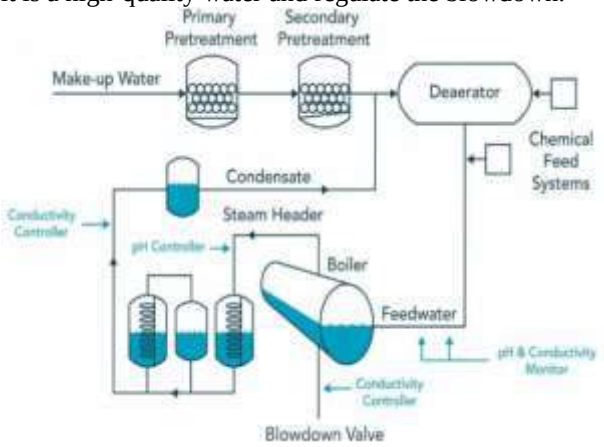

Fig 7 *Water treatment example.*

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FACTORS AFFECTING THE RESEARCH PERFORMANCE OF SCIENCE RESEARCH INSTITUTIONS IN SRI LANKA

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Dr Niluka Thilina Amarasinghe[2]

Article DOI: https://doi.org/10.36713/epra12182
DOI No: 10.36713/epra12182

ABSTRACT

Research performance is recognized as one of the most critical indices for the evaluation of a research institute. However, very few previous scientific studies have focused on the factors affecting a science research institutes' research performance in Sri Lanka. The study focusses to identify whether the research performance of research institutions coming under the State Ministry of Skills Development, Vocational Education, and Research & Innovation is affected by individual and institutional characteristics.

Purpose *The study is to identify the research performance of research institutions is affected by individual and institutional characteristics*

Design/Methodology/Approach *Primary & secondary data has been predominately used in order to address the research objectives. The research is conducted perusing the recent and major Journals and articles that are published in reliable, high quality Journals on the captioned subject. The data concerning the research performance of academics has been extracted from the questionnaire, NIFS Research Repository, Annual Reports and from NASTEC reports. This quantitative study conducted using a deductive approach through a slightly adopted version of an already validated and reliability checked questionnaire*

Findings

Individual characteristics and institutional characteristics were significantly correlated with the research performance (r=0.356, r=0.568 respectively). Of all variables, institutional characteristics had the strongest positive correlation where it could be used as a significant predictor (R^2_{AD}= 0.320) for the research performance of research institutions.

Keywords *Research performance, Individual characteristics, Institutional characteristics*

Paper Type *Research paper*

1.INTRODUCTION

Since 1970, studies in the performance of research and higher education have gained great significance (Dundar and Lewis, 1998). Universities around the world are transforming their policies away from teaching-centered and move toward research-centered. Scholars at universities are involved in education, learning, and research in general via publishing scholarly articles; scholars or academics achieve recognition, promotion, and funding for future study. In Sri Lanka, there are no "teaching-only" institutions since all academics are expected to do both study and teaching. Research performance refers to creative thoughts and ideas that contribute to publishing publications in leading journals and patents following the theoretical and applied studies. According to previous studies, various types of measurements are used to explain the concept of research performance (Brew, 2001). According to Jauch and Glueck (1975), research performance can be measured by counting the number of publications in high-end journals. Journal quality index, citation indexes, peer and colleague evaluations, number of honors and awards, number of papers presented in meetings, number of dissertations, publications (books and articles), invitations to present papers, success in obtaining research grant funding, No of Research Supervision and positions held in professional associations are among the ten criteria used to evaluate research performance in their study. These KPIs will reflect the success of an Institute, which, in turn, will enhance overall national recognition and achievement. Therefore, exploring the influential factors of KPIs' achievement can help identify the major impact factors on research performance.

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The progress of a country depends on national development. And when it comes to national development, the research performance output to the society plays a vast role. A research institution can be called an anchor in the society, a place for knowledge creation and dissemination, a place for creativity and economic progress, a place for economic and workforce development, and, hopefully, a place where productive individuals and leaders are trained for future employment. At the same time, researchers are required to aim towards excellence and to be elitist in certain ways while still "being highly aware of their responsibilities to society at large, social development, and egalitarianism" (Watson, 2007).

This study was conducted in order to identify further and understand whether the individual and institutional characteristics have a significant relationship to research institutions' research performance in Sri Lanka, as measured by Key Performance Indicators (KPI), including the Journal Publications (SCI, SCIE), No of Research Supervision (PhD, Mphil, MSc) and Research Grants received, to seek empirical evidence of such factors, and to add to the literature by helping to develop more comprehensive models of institution research performance as well as to replicate and support previous findings in the literature.

2.LITERATURE REVIEW

Higher education institutions play an important role in society (World Economic Forum, 2017) by raising consciousness, creating knowledge, developing skills, and creating value, all of which are critical elements in ensuring a prosperous future (Cortese, 2003). Similarly, their commitment contributes to industrial growth and, as a result, economic progress (Jayasundara, 2014; Hatakenaka, 2015), which addresses a variety of social issues such as poverty, social disharmony, and inequality among others (Hatakenaka, 2015). The higher education system is supposed to achieve broader economic and social goals, especially in developed countries (Altbach and Salmi, 2011).

2.1 Institute Performance

According to Chen *et al.* (2006), organizational performance can be defined as the "transformation of inputs into outputs to achieve specific outcomes." In terms of material, performance explains the relationship between minimal and effective cost (economy), effective cost and realized performance (efficiency), and output and accomplished result (effectiveness)." There is no consensus in the literature on the criteria to assess organizational performance (DeClerk, 2008; Scott and Davis, 2015).

2.2 Research Performance

Performance is generally regarded as a single dimension concept referring to the performance and success of a certain objective or task. Research findings play a crucial role in producing and evaluating scientists' academic accomplishments, referred to as research performance (Gu *et al.*, 2011). The concept of research performance explicitly refers to the act of publishing an article for publication in an academic journal, publishing or editing a book or monograph; publishing a book review; or presenting a paper at a meeting (Pellino *et al.*, 1984). Over the past decades, three approaches have been used to measure research performance in higher education: the quantitative, the qualitative approaches, and the comprehensive approach. The most commonly used quantitative approach of measuring research performance is analyzing the number of publications in selected outlets, such as academic journals (Baird, 1991; Reinstein and Hasselback, 1997; Dundar and Lewis, 1998), or calculating comprehensive indices from counts of conference papers, journal publications, and books (Hartley *et al.*, 2001). According to previous studies, various types of measurements are used to explain the concept of research performance (Brew, 2001). According to Harris (1990), a variety of performance measures may be used to evaluate academics' research performance. The most often utilized metrics are peer ranking, the amount of research grants obtained, the number of reviewed publications, and the number of citations.

2.3 Factors Influencing Research Performance

Many studies (Clark and Lewis, 1985; Meador *et al.*, 1992) have looked into the factors that influence university and academic research performance. A consistent collection of supporting characteristics that have an impact on institutional research performance has been identified in numerous studies on research performance. According to Wamala and Ssembatya (2015), efficiency in the institute is widely regarded as a measure of research work carried out by individuals, institutions, nations, and regions as a whole. Some researchers have arranged these characteristics into clusters or models to better understand the main factors on research performance and generate a model that describes institute research performance.

According to Kotrlik et al. (2002), graduate students' skills and trust in performing research and research assistants' ability were found to have a substantial effect on institute professors' research article output. Bentley and Blackburn (1990) stated that professors' psychological perceptions and context variables, such as tension, motivation, gender, and age, influence their research performance.

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However, environmental factors, such as research support culture, solid research space and facilities, and good colleague interaction, are also important variables for predicting institute research results (Bentley and Blackburn, 1990).

2.4 Earlier Models on Research Performance

Several models had been proposed to measure the factors affecting research performance. One of the most commonly used theoretical models to study research productivity is the Bland et al. (2002) model.

(a) Bland (2002)

Bland and colleagues synthesized the literature on academic research performance into a model that claims that eight individual characteristics, fifteen institutional characteristics, and four leadership characteristics have been closely correlated with high research performance. According to Bland *et al.* (2002), model research performance will be high when an academic has unique individual traits, works in an institution conducive to research, and is led by someone who has important leadership skills and uses an assertive-participatory approach to management.

(a) Bland et al. (2005)

Bland *et al.* (2005) have used a questionnaire based on theoretical clusters identified in their previous model (Bland *et al.*, 2002). According to this study, relationships within the three broad clusters affect research performance; additionally, it refers to the complex interplay of individual and institutional characteristics, accompanied by effective leadership, which ultimately decides the performance of individuals and departments.

3.Methodology

3.1 Design

A stratified random sampling has been used for the focus group of with two strata, considering the Morgan table (Krejcie & Morgan, 1970). Due to the time limitation, the research samples have been taken from 09 Research Institutions under the State Ministry of Skills Development, Vocational Education, Research and Innovation in Sri Lanka. There are 923 research staff employed in these 9 institutions, and 315 samples have been taken. A slightly adopted version of an already validated and reliability checked questionnaire was used for the data collection. The questionnaire has been pilot tested to assure the clarity and ease of competition. The conceptual framework was designed accordingly as per the Figure 1.

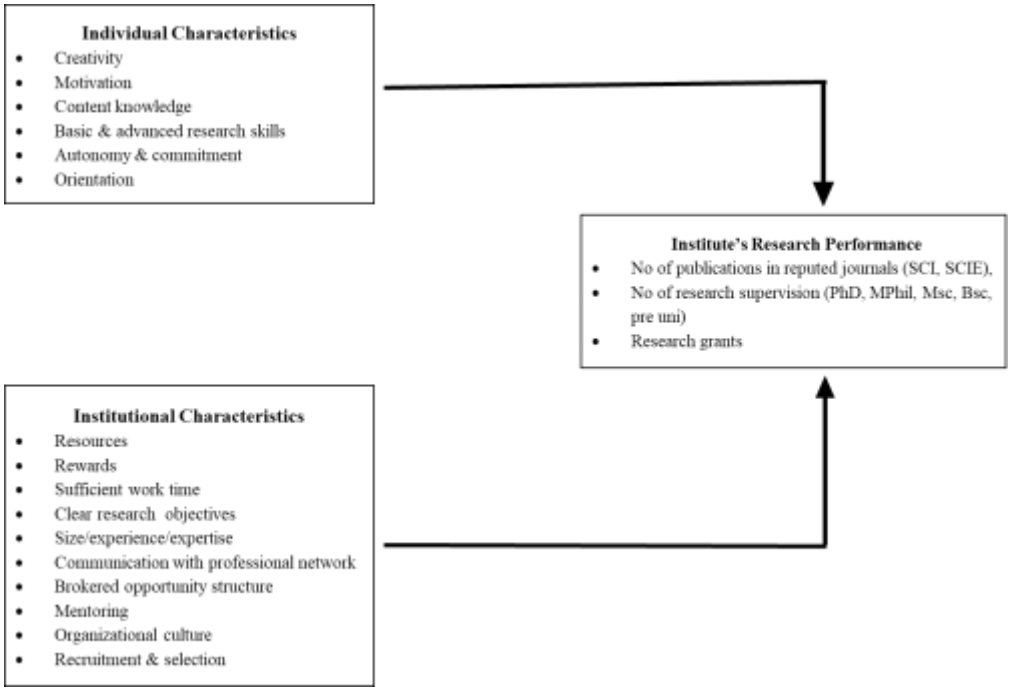

Figure1: Conceptual Framework

Source: Researcher Developed, 2021

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3.2 Hypotheses development

The hypotheses are developed to determine the relationship Individual characteristics (IC), institutional characteristics (ITC) are having on research performance (RP) in science research institutes in Sri Lanka.

Bland *et al*. (2005) found a positive correlation between research performance and individual characteristics. As per Rushton et al. 1987, a productive scholar is a creative person. Scientific productivity was explored by Pelz and Anderews (1976) and Merton (1973), who also recognized that prolific researchers had certain research habits.

Therefore, the relationships could be stated as follows,

H_1: Individual characteristics have a significant impact on research performance in science research institutes in Sri Lanka

In previous studies, a positive association was found between the institutional characteristics and the Research performance. Hadjinicola and Soteriou (2006) have identified the funds received from outside sources for research purposes and enhanced library services would improve the research performance. Levin and Stephan (1991) presented a research performance model where the researchers work not only in the hope of getting rewards but also for the mere happiness of problem-solving.

Therefore, the relationships could be stated as follows,

H_2: Institutional characteristics have a significant impact on research performance in science research institutes in Sri Lanka

4. DISCUSSION

To determine whether the data follows a normal distribution, a normality test was performed two tests were run to check the normality, and the test statistics are shown in Table 1.

***Table 1*: Tests of normality**

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RP	0.066	280	0.051	0.990	280	0.053

[a.] Lilliefors Significance Correction

Since the data set is smaller than 2000 elements Shapiro-Wilk test was used to analyze the data. Accordingly, the P-value is 0.053, which is greater than the significance level of 0.05 (P> 0.05). Therefore, it can be concluded that the data comes from a normal distribution.

Since the data set is normally distributed, parametric tests were conducted to achieve the objectives of the study.

Correlation of the dependent and independent variables

Pearson correlation was done to see the association between the dependent variable and the independent variables and the independent variables themselves. Pearson correlation coefficient was determined to examine the strength and the direction of the linear relationship between two continuous variables. The larger the absolute value of the coefficient, the stronger the relationship between the variables.

***Table 2*: Correlation between the variables tested**

	IC	ITC	RP
IC	1		
ITC	.514**	1	
RP	.356**	.568**	1

**** Correlation is significant at the 0.01 level (2-tailed)**
*** Correlation is significant at the 0.05 level (2-tailed)**
IC= Individual Characteristics, ITC= Institutional Characteristics, RP= Research Performance

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All the tested predictor variables were significantly correlated (P< 0.05) with the RP (r= 0.356, r= 0.568 respectively). ITC was the most tightly correlated predictor variable with the RP.

Linear Regression Analysis

Finally, stepwise linear regression analysis was performed to help determine which of the two predictor variables (IC and ITC) could be used to predict the RP. Two models were tested, which provides the data regarding which model could statistically significantly predict the dependent variable.

Analysis of variance (ANOVA)

The Table of ANOVA shows if the regression models are statistically significant.

***Table 3*: Analysis of variance (ANOVA) in the dependent variable**

Model		Sum of Squares	df	Mean Square	F	P value
Model 1 IC	Regression	8.61	1	8.61	40.40	P< 0.05[b]
	Residual	59.27	278	0.21		
	Total	67.88	279			
Model 2 ITC	Regression	21.87	1	21.87	132.09	P< 0.05[b]
	Residual	46.02	278	0.17		
	Total	67.88	279			

Dependent variable: RP
[b] Predictors: (Constant), IC, ITC

Results have shown that the two regression models are statistically significant (P< 0.05), F (1, 278) = 40.40, P= 0.000; F (1, 278) = 132.09, P= 0.000.

Goodness of fit

The summaries of the two models have revealed the R and R^2 values, which indicate how much of the total variation in the dependent variable can be explained by the independent variable, and the results are shown in Table 4.

***Table 4*: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.356[a]	0.127	0.124	0.46
2	0.568[a]	0.322	0.320	0.41

[a] Predictors: (Constant), IC, ITC

According to the results, the adjusted R^2 values obtained for the two models are 0.124 and 0.320, respectively. This indicates that the independent variables, including IC and ITC explain 12.4%, and 32% of the variability of the dependent variable, respectively.

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The Coefficient values

The coefficient table also determines if the predictor variables statistically significantly contribute to the model.

***Table 5*: Coefficient values of the Dependent variable**

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**P value**
1	Constant	1.837	0.239		7.693	P< 0.05
	IC	0.377	0.059	0.356	6.357	
2	Constant	0.525	0.247		2.128	P< 0.05
	ITC	0.749	0.065	0.568	11.493	

The results of Table 5 show statistically significant unstandardized coefficients for models 1 and 2.

The predictor with non-significant regression coefficient (IC) was removed and the final regression analysis conducted had an adjusted R square of 0.32 {F (1, 278) = 132.09, P= 0.000}, with one significant predictor of RP (ITC).

***Table 6*: Linear Regression Analysis for the estimation of RP**

	Regression equation	R Square	Adjusted R Square	P value
Model 2	RP= 0.525 + (0.749 ITC)	32.2 %	32.0 %	P< 0.05

IC= Individual Characteristics, ITC= Institutional Characteristics

H_1: Individual characteristics have a significant impact on research performance in science research institutes in Sri Lanka

H_2: Institutional characteristics have a significant impact on research performance in science research institutes in Sri Lanka

As per tables 2, 3, 4 and 5, the individual and institutional characteristics have a positive significant impact on research performance in science research institutes in Sri Lanka. Therefore, both the hypotheses are treated as strongly supported and the alternative hypotheses are accepted. However, ITC was the most tightly correlated predictor variable with the RP.

5. CONCLUSION AND MANAGERIAL IMPLICATIONS

The scientific research performance of a country influences all aspects of a country's future by helping its development, economic growth, and greater social well-being. Research performance is recognized as one of the most critical indices for the evaluation of a research institute. Very few previous scientific studies have focused on the factors affecting a science research institutes' research performance in Sri Lanka. Consequently, identifying the individual and institutional factors that influence the Institutions' research performance is potential of great value. Individual characteristics and institutional characteristics were significantly correlated with the research performance (r=0.356, r=0.568 respectively). Of all variables, institutional characteristics had the strongest positive correlation where it could be used as a significant predictor (R^2_{AD}= 0.320) for the research performance. Based on the current study results, it can be concluded that individual characteristics are the foundation of and prerequisite for many of the institutional characteristics. Taken together, these separate analyses strengthen the perception that a highly research performed institution is indeed a function of the combination and interaction of the individual and institutional characteristics.

Dedicating money to research funds is the simplest way to encourage research. As a recommendation, the government can encourage research at the policy level. Grant funding should be distributed to eligible institutions by either a competitive mechanism or subsidies. Research institutions can be strengthened by increasing collaborations and coordination at the governmental level, allowing researchers to conduct research with more freedom, creativity, and collaboration. Industry mentorship improves the research

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publication output more than institutional mentorship. As a result, a deliberate effort must be made to form alliances with industry partners in the form of mutually beneficial partnerships and initiatives involving funding or data collection access.

To keep the high journal standards, workshops or guidelines can be posted on journal websites to allow the researchers to develop their research credibility. Reviewer workshops should be developed, and good reviewers should be rewarded to make the process run more smoothly. Establishing systems and facilities to encourage leading Sri Lankan immigrant scientists to return, join with the institutes, and contribute to research in the prioritized research areas will also be a good approach to achieving higher research performance. It is recommended that systems be put in place to identify, reveal, train, and nurture skilled, capable, and high-caliber young researchers and provide career pathways for rapid advancement and, where possible, to create additional opportunities.

It is recommended that a competitive, comprehensive, structured training program for researchers be developed, including an entry-level orientation program to teach the basics of research planning, procedures, implementation, and ethics and management skills. For a researcher, individual characteristics are factors within their control. Creativity is undoubtedly an important factor in scientific breakthroughs and general research. Thus, special training programs can be arranged for the researchers to develop their creative mind free thinking. Since the institutional research performance is the whole sum average of individual research performance, the institute leadership should focus on developing team-based research productivity so that every faculty member should be the Best Researcher.

6. LIMITATIONS OF THE STUDY

The health risks and government measures introduced by COVID-19 have limited traditional mechanisms for primary data collection. Therefore, this questionnaire has been distributed online as a google form to minimize the disruption, mitigate risk and reduce bias when acquiring data. Data collection has been restricted to 09 research institutions in Sri Lanka due to the difficulty in gathering information from all the other research institutions within a short period. However, the results could be generalized to any institution or industry as the results of the study are in compatibility with the past research findings. Future studies could focus this aspect and conduct a similar study with large sample size, including all the institutes in Sri Lanka. This would change some of the significance of the variables or add predictive power to the model. This would also allow replicating or confirming the findings.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

THE EFFECT OF DEMOGRAPHIC CHARACTERISTICS OF THE RESEARCHERS ON THE PERFORMANCE OF RESEARCH INSTITUTIONS IN SRI LANKA

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Article DOI: https://doi.org/10.36713/epra12187
DOI No: 10.36713/epra12187

ABSTRACT

A country's scientific research performance influences all aspects of a country's future, its development, economic growth, and greater social well-being of the country. However, very few previous scientific studies have focused on the factors affecting a science research institutes' research performance in Sri Lanka. The study focusses to identify whether the research performance of research institutions coming under the State Ministry of Skills Development, Vocational Education, and Research & Innovation is affected by demographic characteristics.

Purpose *The purpose of this research was to identify whether the research performance of research institutions is affected by demographic characteristics.*

Design/Methodology/Approach *To achieve the study aims, primary and secondary data were predominantly used. The study is carried out by perusing recent, major journals and papers on the topic that are published in reputable, high-quality journals. Data on academics' research performance has been taken from NASTEC reports, the NIFS Research Repository, annual reports, and the questionnaire. This quantitative study, which employed a deductive methodology, was carried out using a slightly modified version of a previously validated and reliability-tested questionnaire.*

Findings *The results have shown that researchers with age more than 60 years and more than 20 years of research experience, highest educational qualification of the researchers, university graduation (highest qualification), and the job category have significantly ($P< 0.05$) associated with the research performance where gender and the research field do not influence the research performance.*

Keywords *Research performance, Demographic characteristic*
Paper Type *Research paper*

1. INTRODUCTION

Since 1970, studies mainly on the performance of higher education have become significant. Since then, extensive studies have discussed institutions and university academics (Dundar and Lewis, 1998). Research performance refers to new thoughts and concepts that contribute to publishing publications in leading journals and patent approvals after theoretical and applied studies. According to Zainab (1999), research performance can be elaborated as publishing research findings in high-end journals, patents, conference presentations, impact factors, and reviews. Despite the transition of higher education, globalization and student mobility have encouraged Asian national governments to emphasize the quality of higher education (Hou, 2012). Professors' research performance has been described as a key indicator of higher education quality assurance, whether based on international evaluation, national evaluation, or international higher education rankings, since their research and publications are linked to their teaching contents as well as institution credibility financing, and industry linkage. For decades, researchers have researched the factors that influence research performance. The majority of these studies, from which general models of research performance are obtained, have used cross-sectional designs to examine the influence of possible features that promote research among academics across institutions (Bland *et al*., 2005). As a result, although some researchers have examined the factors influencing professors' research performance, the influence factors and their relative significance in Asian and Western societies might be different. The majority of previous studies

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have focused on university research performance. Few studies have looked into the factors that influence professors' research outcomes in Asia, and significantly less on this topic.

Scholars have suggested models of how these characteristics interact based on a synthesis of the literature, but few experiments have validated these models. They were unable to determine the cumulative effect of features by studying all of them simultaneously in a single institution (Bland et al., 2005). Professors at research institutions are expected to produce knowledge in any disciplinary area, use the latest research outcomes in their teaching, and prepare students to perform research. In the developing world, the benefits of academic life for individuals and the prestige of employing institutions are heavily contingent on their research performance. Accordingly, in these conditions, in less developed countries, institutions and scientists will need more knowledge about how to research products and performance vary across departments, disciplines and what are the most significant demographic factors affecting research performance.

2. LITERATURE REVIEW

People are supposed to have high moral standards in Asia's collectivist communities, particularly in the field of education (Zhang *et al.*, 2005). Research performance, which reflects higher education and research, is increasingly considered to reflect a research institute's performance, significantly increasing national recognition and achievement. For decades, researchers have researched the factors that influence research performance. The majority of these studies, from which general models of research performance are obtained, have used cross-sectional designs to examine the influence of possible features that promote research among academics across institutions (Bland *et al.*, 2005).

2.1 Research Performance

A research institute is created for a specific purpose: to research by taking advantage of its environment in the attainment of high value and rare resources to approve its operations. The ability of the institute to achieve its goals can be called the Institute performance, and when it comes to a research institute, its performance will be measured by the research performance (Gu *et al.*, 2011).

The notion of research performance is comprised of two parts: research and performance. Research is a significant intellectual activity that any researcher is supposed to participate in (Hedjazi and Behravan, 2011). The quality of a paper that allows information acquired from research to be visible and passed on to others can be described as research performance (Bazeley, 2010). There is no agreement among writers on a particular term to describe academic research to date. Researchers have used terms like "scientific research" (Turner and Mairesse, 2003), "scientific productivity" (Bazeley, 2010), "research performance" (Jauch and Glueck, 1975; Wood, 1990), and "research activities" (Jauch and Glueck, 1975) to describe their work.

2.2 Measurements of Research Performance

According to previous studies, various types of measurements are used to explain the concept of research performance (Brew, 2001). According to Jauch and Glueck (1975), research performance can be measured by counting the number of publications in high-end journals. Journal quality index, citation indexes, peer and colleague evaluations, number of honors and awards, number of papers presented in meetings, number of dissertations, publications (books and articles), invitations to present papers, success in obtaining research grant funding, and positions held in professional associations are among the ten criteria used to evaluate research performance in their study. Creswell (1986) emphasized that three common metrics, namely, number of publications, citation counts, and peer-colleague ratings, can be used for data-based studies of science and social science faculty. According to Harris (1990), a variety of performance measures may be used to evaluate academics' research performance. The most often utilized metrics are peer ranking, the amount of research grants obtained, the number of reviewed publications, and the number of citations.

Meanwhile, research performance was defined by Dundar and Lewis (1998) as a dependent variable that journal publications can largely measure. According to Zainab (1999), research performance can be identified as publishing research findings in international journals, conference presentations, impact factors, and reviews.

2.3 Factors Influencing Research Performance

It is evident that, even with the same advisor, different researchers can perform differently in their research; therefore, individual variables should affect research performance. The influence of age, ethnicity, social status, and educational history are among the early work with clearly recognizable factors (Tien and Blackburn, 1996; Fox and Mohapatra, 2007). Scholars later began to analyze certain crucial factors in order to understand and explain research performance, but these factors could not be directly identified.

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As stated by Astin (1984), "Researchers have typically looked at the following factors as possible indicators or independent variables: (1) gender, (2) marital status, (3) age, (4) area of specialization, (5) educational demo experience and characteristics of the graduate institution, (6) characteristics of the employer institution". Research is a highly social enterprise that relies heavily on interactions with one's environment. Many factors highly influence academic performance in their external environments , such as administrative structure, employee competitiveness, resource availability, and organizational culture (Bland *et al.*, 2002; Long and McGinnis, 1981).

2.4 Earlier Models on Research Performance

Overall, to better understand the factors that influence research performance, various researchers have grouped these factors into groups or models. The Bland et al. (2002) model is one of the most widely used theoretical models to study research productivity.

(a) Finkelstein Model

Finkelstein (1984) proposed that seven essential variables predict the rates of publication of an Institution: scientists with a research orientation, the highest terminal degree in a particular field, early publication habits, previous activity in publication, collaboration with disciplinary peers, subscriptions to a broad number of journals, and adequate time allocated to research. Finkelstein's early model of research performance is useful because it gives an initial picture of a successful researcher's qualities at the individual institute level.

(b) Dundar and Lewis Model

Dundar and Lewis (1998) suggested a model of individual characteristics with Inherited skills (e.g., IQ, appearance, gender, and age) and personal environmental factors (e.g., the quality and culture of graduate training).

Hedjazi and Behravan (2017) studied demographic characteristics that influenced the research performance of an agriculture institute in Tehran Province, using the Bland *et al.* (2005) model. The findings indicate that age, academic rank, university graduation, department type, innovation, self-confidence, working patterns, research objectives, a network of contact with peers, research opportunities, expertise and ability, and research opportunities all have significant relationships with the researcher's research performance. To identify and confirm the wide range of factors affecting the research performance of the institutions, Bland *et al.*, (2005) model and other studies (Creswell, 1986) on research performance were used to develop the theoretical framework of this study.

3. METHODOLOGY

3.1 Design

For the focus group, two strata of a stratified random sampling have been utilized, taking the Morgan table into consideration (Krejcie & Morgan, 1970). Due to the time limitation, the research samples have been taken from 09 Research Institutions under the State Ministry of Skills Development, Vocational Education, Research and Innovation in Sri Lanka. In these 9 institutions, there are 923 research staff members working, and 315 samples have been taken. For the data collection, a slightly modified version of a validated and reliability-checked questionnaire was used. To ensure its clarity and competition-friendly nature, the questionnaire has undergone pilot testing. The conceptual framework was designed accordingly as per the Figure 1.

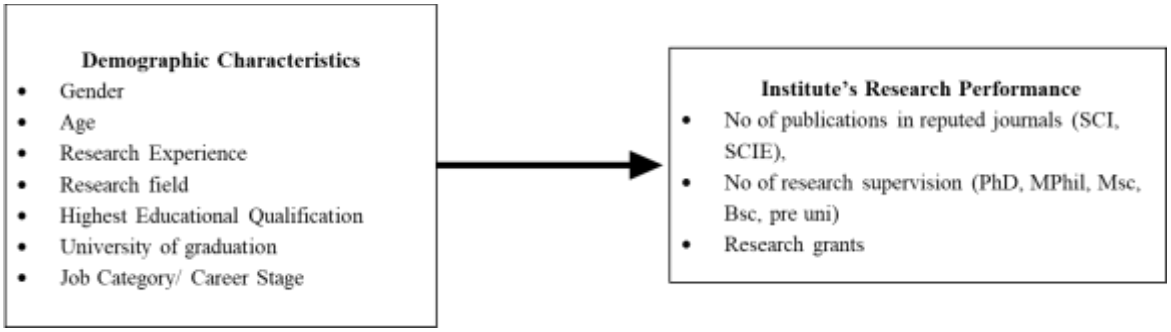

Figure1: Conceptual Framework

Source: Researcher Developed, 2021

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3.2 Hypotheses development

The hypotheses are developed to determine the relationship, the demographic characteristics are having on research performance (RP) in the academics of science research institutes in Sri Lanka.

As per Hedjazi and Behravan (2017) demographic characteristics have a positive relationship with the research performance of an agriculture institute in Tehran Province. The findings indicate that age, academic rank, university graduation, department type, working patterns, research objectives, and research opportunities all have significant relationships with the researcher's research performance.

Frandsen et al. (2015) and Ebadi & Schiffauerova (2016) have found a significantly higher total number of publications by men than women. Furthermore, few other researchers identified that gender reflects a strong relationship with research performance (Stack 2004; Milburn and Brown 2003).

Therefore, the relationship could be stated as follows,

H_1: Gender has a significant impact on research performance in science research institutes in Sri Lanka

High research performance is more likely to be rewarded at prestigious universities (Konrad and Pfeffer 1990; Long et al. 1998). Therefore, researchers who attend prestigious universities may accumulate benefits that would enable them to achieve great research performance (Bayer and Dutton 1977).

Therefore, the relationship could be stated as follows,

H_2: University of graduation has a significant impact on research performance in science research institutes in Sri Lanka

According to a study done by Gingras *et al.* (2008), older professors who remained involved in research maintained a high degree of performance until their retirement. The fact that older researchers are more productive than younger ones clearly support Merton's theory of cumulative advantage (Merton, 1973) and the "Matthew" effect (Merton, 1968).

Therefore, the relationship could be stated as follows,

H_3: Age has a significant impact on research performance in science research institutes in Sri Lanka

Researchers with rich research experience not only have greater ability in research and an improved research methodology, but also have more advanced educational concepts, better teaching methods, and improved skills in educating students (Brewer et al. 1999; Bentley and Blackburn 1990).

Therefore, the relationship could be stated as follows,

H_4: Research experience has a significant impact on research performance in science research institutes in Sri Lanka

According Wood (1990), variations in academic RP can be explained to some degree by differences in research fields and differing conceptions of what constitutes acceptable research performance in these fields. He has noted that the amount of time needed to conduct research and the time between completion and publication will be determined by the research field and that these factors can be cited as related factors to RP.

Therefore, the relationship could be stated as follows,

H_5: Research field has a significant impact on research performance in science research institutes in Sri Lanka

The highest educational qualification would somewhat reflect ability in research and research performance, as well as represent research area influence. The tenure position and a higher academic rank, according to Yoakum (1993), are directly related to research performance. Those who have earned a doctorate will be better researchers, which will significantly improve their potential to produce high-quality research (Whitely et al. 1991).

Therefore, the relationship could be stated as follows,

H_6: Highest educational qualification has a significant impact on research performance in science research institutes in Sri Lanka

According to Creswell (1986), good researchers, as those who appear to hold a senior professorship, spend at least one-third of their time on research activities, publish early in their careers, and earn favorable reviews from peers for research efforts.

Therefore, the relationship could be stated as follows,

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H_7: Job category/career stage has a significant impact on research performance in science research institutes in Sri Lanka

4. DISCUSSION

To determine whether the data follows a normal distribution, a normality test was performed two tests were run to check the normality, and the test statistics are shown in Table 1.

***Table 6*: Tests of normality**

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RP	0.066	280	0.051	0.990	280	0.053

[a.] Lilliefors Significance Correction

Since the data set is smaller than 2000 elements Shapiro-Wilk test was used to analyze the data. Accordingly, the P-value is 0.053, which is greater than the significance level of 0.05 (P> 0.05). Therefore, it can be concluded that the data comes from a normal distribution.
Since the data set is normally distributed, parametric tests were conducted to achieve the objectives of the study.

Association of the Gender (GEN) with the RP

An Independent t-test was carried out to realize if there is a statistically significant difference between males and females towards the RP. Table 2 shows the statistical difference in the mean values of RP according to gender.

***Table 2*: Mean differences between males and females for the RP**

	RP		
	Independent difference		
	Mean	**Std. Error**	**t – value**
Male - Female	0.67	0.59	1.13
RP – Research Performance	P> 0.05		

Table 2 illustrates that there is no significant difference in the mean values obtained for the RP between males and females.

Association of the University of Graduation (UG) with the RP

An Independent t-test was carried out to realize if there is a statistically significant difference between the two types of the university of graduation towards the RP. Table 3 shows the statistical difference in the mean values of RP according to the university of graduation.

***Table* 3 Mean differences in the University of Graduation for the RP**

	RP		
	Independent difference		
	Mean	Std. Error	t – value
Local - International	- 0.23	0.6	- 3.93
RP – Research Performance	P< 0.05		

Table 3 illustrates a significant difference in the mean values obtained for the RP between local and international universities. It was noted that the mean value for the RP was significantly higher in the highest educational qualification obtained from an international university than a local university.

For the variables with more than two categorical levels, one-way ANOVA was carried out to see if the independent variables affect the dependent variable. As a requirement for the ANOVA test, to see the variances of the variances that indicate that each comparison group's variances are equal, Leven statistic was tested for all variables, including AC, YRE, RF, HEQ, and JC, before running the test.

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For all the tested variables, the Levene statistic based on comparison of medians is greater than 0.05 which means the homogeneity of variance has been made, and the ANOVA test is considered stronger and more sensitive.

Association of the Age with the RP

Table 4 shows if there is a significant difference among different age categories for the research performance.

***Table 4*: Analysis of variance (ANOVA) for the age category**

	Sum of Squares	df	Mean Square	F	P value
Between Groups	5.79	4	1.45	6.41	P< 0.05
Within Groups	62.09	275	0.23		
Total	67.88	279			

Table 4 illustrates a statistically significant difference among the means of the different age categories as demonstrated by one-way ANOVA (F (4,275) = 6.41, P = 0.000).

Tukey Post Hoc Test has generated multiple comparisons among different age categories. The results are shown in Table 5.

***Table 5*: Multiple comparisons of the mean values for the age category**

	Mean Difference	Std. Error	P value
AC 5 – AC 1	0.46	0.09	P< 0.05
AC 5 – AC 2	0.38	0.09	
AC 5 – AC 3	0.35	0.10	
AC 5 – AC 4	0.28	0.09	

AC= Age Category
AC 1: 20 – 30, AC 21 - 31 – 40, AC 30 - 41 – 50, AC 40 - 51 – 60, AC 5: Above 60

Accordingly, the test results have shown that the researchers with age above 60 years have significantly higher research performance than the researchers with age groups 20 – 30, 31 – 40, 41 – 50, 51 – 60 years, respectively.

Association of the years of research experience (YRE) with the RP

Table 6 shows a significant difference among different years of research experience for the research performance.

***Table 6*: Analysis of variance (ANOVA) for the years of research experience**

	Sum of Squares	df	Mean Square	F	P value
Between Groups	6.16	4	1.54	6.87	P< 0.05
Within Groups	61.71	275	0.22		
Total	67.88	279			

Table 6 illustrates that there is a statistically significant difference among the means of different years of research experience as demonstrated by one-way ANOVA (F (4,275) = 6.87, P = 0.000).

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***Table 7*: Multiple comparisons of the mean values for the years of research experience**

	Mean Difference	Std. Error	P value
YER 3 – YER 1	0.19	0.70	
YER 4 – YER 1	0.41	0.99	P< 0.05
YER 5 – YER 1	0.48	0.13	

YER= Years of Research Experience
YER 1: 01 – 10, YER 3: 21 – 30, YER 4: 31 – 40, YER 5: 41 – 50

According to the Tukey Post Hoc Test results, it has been shown that the researchers with more than 20 years of research experience have significantly higher research performance than the researchers with less than 20 years of experience.

Association of the research field (RF) with the RP
Table 8 shows if there is a significant difference among different research fields for the research performance.

***Table 8*: Analysis of variance (ANOVA) for the research field**

	Sum of Squares	df	Mean Square	F	P value
Between Groups	0.96	4	0.24	0.98	P> 0.05
Within Groups	66.93	275	0.24		
Total	67.88	279			

Table 8 illustrates that there is no statistically significant difference among the means of different research fields as demonstrated by one-way ANOVA (F (4,275) = 0.98, P = 0.418).

Association of the highest educational qualification (HEQ) with the RP
Table 9 shows if there is a significant difference in the highest educational qualification for the research performance.

***Table 9*: Analysis of variance (ANOVA) for the highest educational qualification**

	Sum of Squares	df	Mean Square	F	P value
Between Groups	2.34	4	0.59	2.46	P< 0.05
Within Groups	65.54	275	0.24		
Total	67.88	279			

Table 9 illustrates that there is a statistically significant difference among the means of various highest educational qualifications as demonstrated by one-way ANOVA (F (4,275) = 2.46, P = 0.046). However, the multiple comparisons have demonstrated sufficiently large P values for most all the comparisons.

Association of the job category/career stage (JC) with the RP
Table 10 shows if there is a significant difference among different job categories for the research performance.

***Table 10*: Analysis of variance (ANOVA) for the job category/career stage**

	Sum of Squares	df	Mean Square	F	P value
Between Groups	5.01	2	2.50	11.03	P< 0.05
Within Groups	62.87	277	0.23		
Total	67.88	279			

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Table 10 illustrates a statistically significant difference among the means of different job categories as demonstrated by one-way ANOVA (F (2,277) = 11.03, P = 0.000).

***Table 11*: Multiple comparisons of the mean values for the job category/career stage**

	Mean Difference	Std. Error	P value
JC 3 – JC 1	0.31	0.07	P< 0.05
JC 3 – JC 2	0.18	0.07	

JC= Job Category
JC 1: Early career (Research Fellow), JC 2: Mid-career (Associate Research Professor/Research Professor), JC 3: Late career (Senior Research Professor)

The results of the multiple comparisons have shown that the researchers who are in their late-career as senior research professors have significantly higher research performance than other research categories.

Correlation of the dependent and independent variables

Pearson correlation was done to see the association between the dependent variable and the independent variables and the independent variables themselves.

***Table 12*: Correlation between the variables tested**

	AC	YRE	RF	HEQ	UG	JC	RP
AC	1						
YRE	.908**	1					
RF	.067	.063	1				
HEQ	.735**	.650**	-.020	1			
UG	.713**	.663**	.074	.656**	1		
JC	.871**	.847**	.087	.705**	.760**	1	
RP	.262**	.295**	-.030	.161**	.229**	.271**	1

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)
AC= Age Category, YRE= Years of Research Experience, RF= Research Field, HEQ= Highest Educational Qualification, UG= University of Graduation, JC= Job Category, RP= Research Performance

All the tested predictor variables were significantly correlated (P< 0.05) with the RP except RF.

H_1: Gender has a significant impact on research performance in science research institutes in Sri Lanka

As per table 2, It has been shown that there is no significant relationship of gender with the RP in science research institutes in Sri Lanka. Therefore, the alternate hypothesis is rejected.

H_2: University of graduation has a significant impact on research performance in science research institutes in Sri Lanka

As per table 3, the University of graduation has a positive significant impact on research performance in science research institutes in Sri Lanka. It was noted that the mean value for the RP was significantly higher in the highest educational qualification obtained from an international university than a local university. Therefore, the hypothesis is treated as strongly supported and the alternative hypothesis is accepted.

H_3: Age has a significant impact on research performance in science research institutes in Sri Lanka

As per table 4 and 5, age has a positive significant impact on research performance in science research institutes in Sri Lanka. The test results have shown that the researchers with age above 60 years have significantly higher RP than the researchers with other age groups. Therefore, the hypothesis is treated as strongly supported and the alternative hypothesis is accepted.

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H_4: Research experience has a significant impact on research performance in science research institutes in Sri Lanka
As per table 6 and 7, research experience has a positive significant impact on research performance in science research institutes in Sri Lanka. It has been shown that the researchers with more than 20 years of research experience have significantly higher research performance than the researchers with less than 20 years of experience Therefore, the hypothesis is treated as strongly supported and the alternative hypothesis is accepted.

H_5: Research field has a significant impact on research performance in science research institutes in Sri Lanka
As per table 8, It has been shown that there is no significant relationship of research field with the RP in science research institutes in Sri Lanka. Therefore, the alternate hypothesis is rejected.

H_6: Highest educational qualification has a significant impact on research performance in science research institutes in Sri Lanka
As per table 9, Highest educational qualification has a positive significant impact on research performance in science research institutes in Sri Lanka. Therefore, the hypothesis is treated as strongly supported and the alternative hypothesis is accepted.

H_8: Job category/career stage has a significant impact on research performance in science research institutes in Sri Lanka
As per table 10 and 11, Job category/career stage has a positive significant impact on research performance in science research institutes in Sri Lanka. The results have shown that the researchers who are in their late-career as senior research professors have significantly higher research performance than other research categories. Therefore, the hypothesis is treated as strongly supported and the alternative hypothesis is accepted.

5. CONCLUSION AND MANAGERIAL IMPLICATIONS

The purpose of this research was to identify whether the research performance of research institutions is affected by demographic characteristics. The study also aims to address the gap in empirical research by investigating the factors affecting the research performance of research institutes in the Sri Lankan context. The results have shown that researchers with age more than 60 years and more than 20 years of research experience, highest educational qualification of the researchers, university graduation (highest qualification), and the job category have significantly ($P< 0.05$) associated with the research performance where gender and the research field do not influence the research performance.

Retaining the old scientists and increasing their retirement age is an approach that should be considered more by the heads of the institutions. At the same time, a positive group climate can be created by facilitating other young researchers to upgrade their qualifications to higher qualifications and improve their knowledge and skills. Researchers whose age is more than 60 years and who have attained senior researcher level will be poised as role models to young researchers to encourage research interest among them. This will encourage all of the institute's researchers to develop a mindset that encourages them to involve themself in new knowledge creation, which will eventually improve research performance. This study results suggest that having experienced researchers is necessary for research performance. Hence, it is recommended for the HR division of the institutes to recruit researchers who have research experience or passion and inclination on research and publications. It is also recommended to create adjunct professorial posts and them to be filled with experienced researchers. This might benefit in two ways in helping the younger researchers. International exposure and standards will help improve an institute's research output. Therefore, it is most recommended that the institute's leadership motivates the young researchers to get their highest educational qualification from an international university.

It is recommended that a competitive, comprehensive, structured training program for researchers be developed, including an entry-level orientation program to teach the basics of research planning, procedures, implementation, and ethics and management skills. Promoting and reinforcing joint postgraduate research between government research institutes and international universities will help to strengthen the currently available 'pathways' for training researchers. It is most recommended that the institute's leadership motivates the young researchers to get their highest educational qualification from an international university. A mechanism can be implemented that the promotions and the increments should be strictly depending on the individual researchers' performance towards the institute. The institute leadership is recommended to review the research performance of the researchers through an annual self-appraisal report.

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6. LIMITATIONS OF THE STUDY

Traditional primary data gathering methods have been constrained by the health risks and governmental restrictions brought forth by COVID-19. To minimize disruption, minimize risk, and reduce bias when gathering data, this questionnaire has been distributed online as a google form. Due to the difficulty of collecting data from all other research institutions in a timely manner, the data collection has been limited to nine research institutes in Sri Lanka. However, the results could be generalized to any institution or industry as the results of the study are in compatibility with the past research findings. Future research might concentrate on this issue and carry out a large-scale, representative study involving all Sri Lankan research institutions.

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FROM BARREN LANDS TO INDUSTRIAL HUB.....JOURNEY OF FIROZABAD, UTTAR PRADESH

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Firozabad is Uttar Pradesh's district headquarters. The industry of creating glass bangles is well-known in the city. On the east side, it is 40 kilometers from Agra and 250 kilometers from Delhi, the capital city of India. The majority of the people is employed in the industry. The towns of Shikohabad and Tundla are located in the Firozabad district. Tundla is situated to the west and east of the city of Shikohabad. Glass bangles are the primary business in the area. Due to over pollution gas business in the city is reduced. Women of the city are employed in their houses to prepare and give the final touch to the bangles. The earlier name of the city was Chandawar from the founder king Chandrasen.

The city has evolved in various time zones like from the time of Chauhan's era to Firoz's era. The city has evolved from the kingdom of Chandwar to District Firozabad. Firozabad had witnessed levels of evolution in terms of regional evolution, aerial evolution, legal evolution and economical evolution. Now it is also called *Suhag Nagari* which is derived from the making of bangles in the city which is the main source of income and economic growth of the city and plays an important role in the settlement pattern of the city.

Firozabad city had evolved in phases. It is evident that downfall of Chandwar became the rising time of Firozabad. Now Chandwar is just a village on the outskirts of Firozabad. Chandwar a place with so much of historical importance from Chauhans reign to Jaychand fight it had witnessed all. Those ruins are example of negligence over Chandwar. Only religious places like jain mandir, hanuman mandir and sufi dargah are in good shape and maintained time to time. The fort is almost demolished its only wall is left which is in very bad shape. All the brick joints are losing their packing capacity due to which it had almost demolished. All the mosaic art has now blurred and started to chip off from the surface. Thus realization about the importance of the place is necessary.

Firozabad is now developing city from a barren agricultural land. Glass have played an important role in evolution of the town as one of the major factor effecting lifestyle and evolution of a place is economic source. When people came in business of glass and saw the growth many people shifted to the city for economic purposes. They start settling in unplanned manner with narrow roads and less facilities and started to earn. Later the need of resources increase as work load increase and many laborers, economically powerful people and political powerful people joined the force hence residences, school, trade route (buses and rails) and public area evolve periodically.

Glassmaking was the main source of income then and now. The art of curating glass in different shapes and forms is intangible and cannot be performed by any outstation worker. A perfectionist and experienced person would be required to do so. The techniques are shared to close ones and experts make them perfect in the field. The original technique of doing this is only in the hand of the labor who is doing the work. Every tourist or sells man who is buying glass products like bangles or chandeliers of any part of the country would prefer Firozabad manufactured product as they know the value and authenticity of the product. Even the town is known as Suhag Nagri for some good reasons. The industry is standing here for a long time and is there to stand strong hence proving its authenticity over these years. Hence Firozabad is settling as industry town.

Despite the glass business and its growth over years some architectural marvels are standing strong showcasing the art of the city. The main attraction is Chadamilal Jain Mandir constructed in marble and the fine cuts, planning, symmetry, mosaic dome and landscape makes it worth a visit. It is also an attraction due to its location in the core main area of the city. There is lot to explore in those narrow lanes like the *havellis* and religious places.

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The structures of the Firozabad which are architectural marvels are majorly *havellis* and institutes. These havellis and institutes dates back to 1919 starting from SRK College.

Shri Ram Chandra Kanhaiyalal College (SRK College) was established in 1919 for better educational environment in city. Some of the highlighting features of the structure are onion dome, octagonal dome chattri, semicircular arch, arched corridor, jallies, spandrel[1], finial[2], lotus decoration, decorative spires, dado detailing and rich landscape points out towards Islamic architecture influence.

Havellis in 1920s

Residence of Mushtaq Ali Khan was built before 90years ago (around 1920s). He was a glass factory owner and at that time family size was 80-90 people now it house 25-30 people. It has burial of original owner in their residence compound and situated in *purani mandi*. With detailed rock cut exterior with floral detailing, semicircular arches, glass beading used in interior arches, German tiles and wooden batten roof are some features of this residence.

[1] Spandrel: Between one sides of an arch's outer curve, a wall, and the ceiling or framework, there is an approximately triangular void.
[2] Finial: a decoration at the object's top, end, or corner.

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Rambabu ji ki *havelli* was built around 100years back. Any evident history could not be found due to change in ownership. It is now used as residence purpose. Original owner could not be traced as this property was bought by Rambabu ji long back and after his demise there is no one who might know about it. It is a marvel covered in detailed rock cut exterior and some other features are chatrris, symmetry in elevation, pointed arches, use of German tiles and beautiful landscape. Slight changes had been made to original structure mainly in interior.




Havelli in 1939

Residence of Mehboob Ali Khan which was made for residence purpose in 1939. Now two families reside in this house with some part of the house locked up. This residence have burial of Mehboob Ali Khan in their compound. It is called Shauqat Manzil now. It is built in area of 1.5hectare and situated in purani mandi. Detailed rock cut exterior is common but some add on features are like multifoliated arch, detailed gates and detailed railing extending till balcony ceiling supported on parapets and brackets.

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Havelli in 1947

Residence of Late. Shree Gopi Nath Aggarwal Jain (Raja). It was made for the purpose of residence in 1947 now it serve the motive of residence and some area is on rent for shops. It is 100'X100' property. No changes had been made in exterior only interiors had been changed as per usage. Mosaic[3] stairs (Figure 40), detailed and decorative rock cut exterior, semicircular arches, jallis in railing and lotus detailing are attraction of the structure. A stone locally called laal pathar was used in construction (not to be confused with sandstone).

Residence of Chadamilal Jain has two parts and built with rock cut detailing in columns, railing and decorative places like entrance and mosaic art (Figure 42). A whole wall is covered in mosaic making it felt like a painting. Now is used as packaging unit and conference and a little part for residence purpose.

Hospital in 1951

Ram Labhaya Arora memorial was built in 1952 by Ramji Arora for betterment of citizens and it is built in mosaic art and railing jaali which is still in working condition for free for under privileged crowd.

[3] Mosaic: In art, mosaic refers to the ornamentation of a surface with designs made out of closely spaced, usually multicolored small bits of stone, mineral, glass, tile, or shell.

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The most important and earliest built structure Tomb of Firoz Shah built in 16th century is still standing strong along with some changes in the original structures but some original features can be traced like octagonal plan, symmetry in elevation, Islamic furnishings, dome on supported pendentives, arches, niches, sandstone brackets and parapets, sandstone *jaali*, *chattri* and designing features.

From architectural study detailed rock cut elevations, arches, use of German tiles, influence of Islamic architecture and mosaic were common in the areas. Mosaic art had place in every element from floor, wall art and domes. It was done with several materials like stone and glass. All of this architecture is diminishing due to lack of care and maintenance over time.

Hence Firozabad is lot more then glass industries like heritage value and its evolution journey which no one recognize and value now. Glass is part of Firozabad and a major one which also need all the respect due to its undervalue over years. Firozabad glass industry is secondary type of industry which has impacted many lives in the city. Due to rise in demand of glass many people started to settle in Firozabad as it was new concept in the area and was in great demand. Due to availability of resources and trade routes via water (earlier) and rail (later) made incoming and outgoing of the goods easier. The connectivity of the city to Agra made the locally made glass bangles have a name in market as Agra is a tourist hub. The city had grew from a barren land to a developing district whose major credit goes to glass industry.

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CONTRIBUTING FACTORS TO MOBILE FINANCIAL FRAUD WITHIN KENYA

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ABSTRACT

The expansion of mobile banking services has created various challenges to financial sectors i.e. SIM swapping, hacking identity theft, social engineering, denial of service attack and account take over. The perceived criminal actions are due to continuous growth of mobile banking and computer networks. The identified challenges of rise in mobile financial fraud are due to lack of a proper strategies to curb mobile fraud. This study investigated factors contributing to mobile financial fraud within Kenya. The study used both qualitative and quantitative method of data collection. The developed framework was informed by Fraud Triangle Theory (FTT). The findings confirmed that the fraud triangle is very helpful when applied to factors contributing to mobile financial fraud. Finally, the result of findings will have significant implications to financial institution policymakers, academic researchers, anti-fraud organizations and Central Bank of Kenya.

KEY WORDS: *Contributing factors, Financial fraud, Mobile, Within Kenya, Fraud triangle, Factors, Determine.*

1. INTRODUCTION

Mobile financial services (MFS) or Mobile banking is often referred to as M-banking or SMS banking. In 1999, a European firm named PayBox, which was financially sponsored by Deutsche Bank, launched mobile banking. The SMS was the first mobile banking service available. It was a new field in the banking industry. Older phones, on the other hand, had limited capability. Mobile phones, palm PCs, and personal digital assistants lacked physical and logical support. The greater cost of data plans, as well as the slower network speed, were additional issues impeding the expansion of mobile banking. This has been enhanced as technology, hardware, and software have advanced. Mobile device prices have dropped dramatically and continue to fall. The network speed is substantially faster than previously, and data plans are less expensive. All of these developments have supplied the raw ingredients for the expansion of mobile banking, and the number of individuals utilizing mobile banking is growing by the day. Users who formerly used PCs or laptop computers for online banking are shifting to mobile banking due to the convenience of use and quick availability (Price Waterhouse Coopers, 2011).

Innovation in technology has opened new channels that now expose commercial banks in Kenya to cases of financial fraud. Financial fraud has grown immensely with the increasing widespread use of the internet. Furthermore, bank employees have sufficient knowledge on the information systems which in conjunction with technical growth, may provide individuals with the potential to perpetrate fraud. All they require is pressure and rationalization with which they become part of fraud cartels which are fleecing millions of shillings from financial institutions (Cressey, 1973). Kenyan financial institutions were victims of over half of the Kes. 4.1 billion scams that rocked East African banks in 2012, as technology made the fraud easier. The incidences of crime that have troubled

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banks have continued to rise as the fraudsters keep on inventing new ways of keeping a head of the security measures and agencies (Deloitte F. S., 2013).

In Kenya more than three million five hundred thousand people use mobile banking services in the country every month. Out of this, Safaricom receives over 200 cases of illegal SIM swaps, which cost a loss of about 1 million in a month. Due to high losses, the Telco Company decided to come up with anti-fraud intelligence tool to notify financial sector participants of illegal mobile banking transactions including SIM card swaps and recently registered lines. Despite all these attempts, mobile fraud continues to increase. Hence there is need to holistically manage mobile fraud (Safaricom, 2019).

1.1 Research Problem

Mobile financial fraud is overwhelmingly becoming a challenge to the users and financial service providers. Several incidents of mobile banking crime have been reported where customers lose money on a daily basis through mobile fraud. This has raised concerns within the financial organizations. Therefore, rise in mobile financial fraud is due to lack of proper strategies to curb factors contributing to mobile financial fraud. This study is therefore aimed at determine factors contributing to mobile financial fraud within Kenya (CBK, 2018).

1.2 Objectives of the study

- To determine factors contributing to mobile financial fraud within Kenya.

1.3 Research questions

- What are the factors contributing to mobile financial fraud within Kenya?

1.4 Scope of the study

The scope was set to establish the limits of what should and should not be discussed. The research is limited to factors contributing to mobile financial fraud within Kenya.

2. LITERATURE REVIEW

2.1 Global state of mobile banking industry

There is little question that mobile banking described as the delivery of banking services and monetary transactions via a mobile gadget like a phone or tablet, has achieved amazing adoption rates since the very first SMS and WAP offers. However, between 2000 and 2005, these services remained limited and severely constrained in terms of the extent of functionality provided i.e. typically just balance confirmations and mini-statements. Nowadays, almost all banks now have some sort of mobile banking solution, either created in-house or via the use of third-party specialized suppliers. In the industrialized world, the fast spread of smart phones and more recently, tablets have raised demand for mobile banking to the point that total global mobile financial consumers stood at 0.8 billion in 2014. A stunning discovery is that this already excellent level of acceptance is expected to continue significantly expanding in the future years with an estimate of a worldwide mobile banking user base of about 2.0 billion users by 2021. In terms of transaction quantity, mobile is currently the most important banking platform for the vast majority of financial organizations (KPMG, 2019).

2.2 Financial industry in Kenya

The CBK is an autonomous Central Bank that oversees the Kenyan banking industry as well as monetary and fiscal policies for the Kenyan government. Apart from designing and putting monetary policy into action, the CBK fosters liquidity, solvency, stability and correct operation of Kenya's financial and banking infrastructure (CBK, 2018). As of December 31, 2018, the Kenyan banking industry included the following: Central Bank of Kenya (CBK) as the regulatory authority, 43 banking institutions (42 commercial banks and 1 mortgage finance company), 8 representative offices of foreign banks, 13 Microfinance Banks (MFBs), 3 Credit Reference Bureaus (CRBs), 19 Money Remittance Providers (MRPs), 8 non-operating bank holding companies, and 73 foreign exchange (forex) bureaus. Out of the 43 financial institutions, 40 were owned privately, while the Kenyan government held a majority stake in three out of the 40 individually owned banks, 25 were domestically owned (the dominant shareholders were Kenyans) while 15 were internationally owned. The twenty-five (25) locally owned financial institutions included 24 commercial banks and 1 mortgage financing firm. The 15 foreign-owned institutions are all commercial banks, with 12 being local subsidiaries of foreign banks and three being branches of foreign banks. All regulated currency bureaus, microfinance banks, credit reference bureaus, money remittance providers, non-operating bank holding companies, and are privately held (CBK, 2018)

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2.3 Factors contributing to mobile fraud

Fraud studies include information technology, forensics, psychology, accounting, auditing, and management. The emergence and increase of fraud may be explained by a model that includes three primary factors: personal pressure, availability of opportunity, and justification of the act or attitude (Wells, 2005). Factors contributing to mobile fraud entails the following: non standardized processes i.e. failure to abide to CBK, poor compliance monitoring, interbank competition leading to reduced compliance check, information sharing hence reduced confidentiality, organization culture i.e. some societies are generally lenient to fraudsters, high cost of transactions hence system abuse, poor remuneration hence staffs handling cash will be tempted to steal, weak pricing policy, maturity of the mobile money services, poor awareness i.e. lack of training and frequent communication, seasonality- fraud is high during festivitie, certainity, celerity, severity, pressure, unemployment and lack of centralized database for fraudsters (Clark & Hollinger, 2007).

2.4 Theoretical foundation of the study

Fraud Triangle Theory (FTT), was adopted as theoretical framework supporting this research. The triangle's legs reflect an individual's pressure, opportunity, and explanation for committing fraud. The first leg is employee pressure, which develops as a result of non-shareable financial concerns. There are six types of non-sharable challenges namely too much alcohol drinking, investment failure, business recession, family demand, living beyond means and lack of trust between employer and employee. The second leg is opportunity, the non-shareable challenge would not result to a worker committing crime on his or her own; the worker must therefore believe that he or she has the chance to execute fraud without being found. Trust, insufficient internal controls, permissive discipline procedures, or a lack of corporate ethics may create opportunities. The third leg is rationalization. Rationalization is not an afterthought that justifies the fraud; rather, it is the true reason that the individual has for committing fraud, i.e. it is culture here. Rationalization is therefore part of the inspiration to commit fraud (Cressey, 1973).

2.5 Enhanced framework for fraud in Kenya's financial industry

The framework takes into account a number of the requirements and identifies potential areas of influence on the practice of fraud i.e. it separates the theoritical, qualitative, internal and external industry factors. The internal factors represent bank specific and inter-bank factors while the external factors represent factors from without the banking industry that impact on fraud management. The framework begins with the core of the fraud – the perpetrator, or individual committing the fraud, and his or her motivation. Thus, the first component ofthe framework is represented by Cressey's fraud triangle formed by the three elements of pressure, opportunity, and rationalization (Cressey, 1973).

The second component is the internal industry factors, including factors that both encourage and discourage fraud, such as information sharing, inter-bank competition, organisational characteristics, insider involvement, internal controls, and information technology. The third component is the external industry factors (Wells, 2005). These include legal factors like regulation and law and enforcement as well as general governance environment. Sociocultural factors such as corruption and acceptable business practices also considered. The use of information technology in society generally is also considered at this level (Wilhelm, 2004). Further factors considered include political, economic, and customer factors. The third components are theoretical and qualitative factors which entails celerity, certainty, severity, unemployment and lack of centralized database (Serah, 2012). Figure 2.0 below shows enhanced framework for fraud in Kenya's financial industry.

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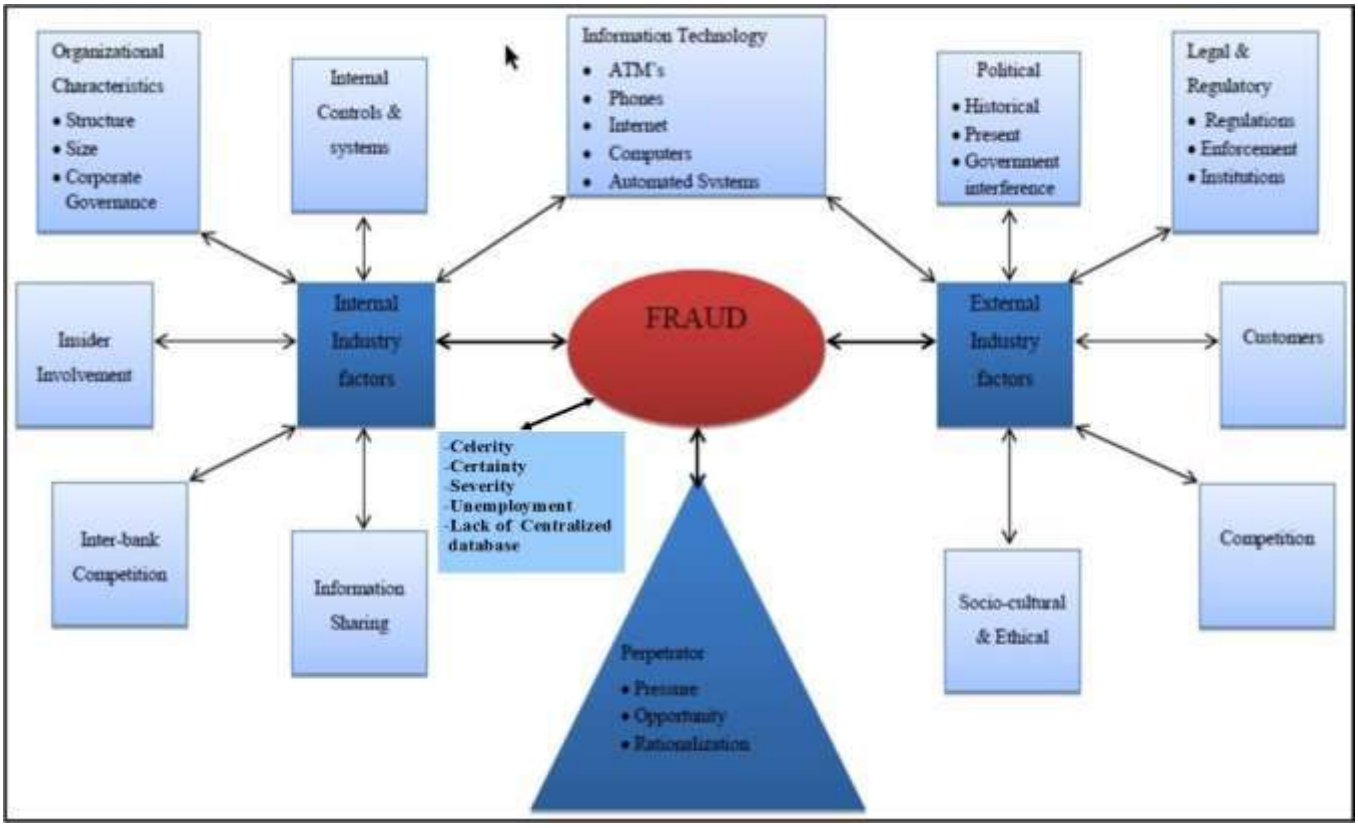

Figure 2.0 - Enhanced framework for fraud in Kenya's financial industry

3 RESEARCH DESIGN AND METHODOLOGY

Research methodology provides further information on the research design method used in determining the area under study. It also highlights on the population under review, sampling technique, data collection method, and research procedure and data analysis method. This research adopted both qualitative and quantitative perspective hence integrating findings from both approaches in order to arrive at a highly robust approach. The research methods are intended to provide a robust research process that mitigates the weaknesses of qualitative and quantitative research individually (Clark & Hollinger, 2007).

3.1 Research design

This is blue print of the study that provides the outline and direction of a research. This study used a descriptive research design. A descriptive research design involves the investigation of a topic with the aim and purpose of describing the problem or identifying problems. A descriptive research design was justified for use in this study as it sought to determine factors contributing to mobile financial fraud within Kenya (Kothari C, 2019).

3.2 Target population

The Kenyan banking industry is made-up of 43 banks with an average of 15 IT and forensic staffs per bank hence making a total of 645 staffs (CBK, 2018). Therefore, the population for this study was mainly IT and forensic staffs of the commercial banks in Kenya which are mainly based at their head offices in Nairobi. The choice of the commercial banks was based on their highest number of branches and customers all over the country (CBK, 2018). They also hold 95% of the total capital that are available in Kenya. Though, Omotayo and Kulatunga observed that, in most cases, interviewing the entire population is very difficult, due to inadequate time, limited accessibility, lack of enough funds and other inconveniences. Thus, in this situation, for economic reasons, it was very easy to interview a subgroup of the population, which means a "sample" (Omotayo & Kulatunga, 2015).

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3.3 Sample size and sampling strategy

It is obvious and popularly accepted that the selection of any sampling method is determined by the research objectives or questions of the study. It is better for researchers to employ a probability sampling technique where there is the opportunity to do so as it is considered to produce confirmable correct outcomes compared with the non-probability sampling technique. However, there are aspects of research studies which may make it impossible to employ a probability sampling technique. The non-probability sampling is considered as presence, progressive and emergent. This begins from the types or kinds of the research, development and method, which describes a procedure of finding as contrary to the testing of hypothesis (Guba & Lincoln, 1994).

Therefore, the choice of non-probability sampling requires solid assumptions on the nature and proportion of the sample for its validity (Barratt, Ferris, & Lenton, 2015). The sample size for the study was calculated based on Yamane's formula because it is accurate and suitable for random sampling (Yamane, 1967). By using Yamane's formula of calculating sample size with an error of 0.05 and with a confidence coefficient of 95% (Yamane, 1967), the calculation from a population of 43 commercial banks (43*15 = 645 IT and Forensic staffs) came up with 247as sample size. The sample size was obtained from 17 commercial banks which are in tier one and two, given anonymous titles: Bank A, Bank B, Bank C, Bank D, Bank E, Bank F, Bank G, Bank H, Bank I, Bank J, Bank K, Bank L, Bank M, Bank N, Bank O, Bank P and Bank Q. The rationale of obtaining the sample from 17 banks was that, the selected banks are in tier one and two (they command 80% of total banking income), have the highest number of branches and have their head office in the capital city of Nairobi, while the other banks had few branches, making up 20% of the total banking income. The selected banks were appropriate because of their heavy transactions due to many branches and high involvement in mobile banking commerce.

3.4 Data analysis method

Once the data was received, the researcher used the data by checking for missing data or unfilled sections of the questionnaire. Only sections properly filled were used. After cleaning and editing of data, coding was done. The data collected was then analyzed by determining mean and standard deviation of factors contributing to mobile fraud. Final data analyzed was presented using tables.

4 RESEARCH FINDINGS AND ANALYSIS

Two hundred and forty-seven (247) questionnaires were issued and positive feedback were received from two hundred and thirty-seven (237). The questionnaires were spread across 17 commercial banks which are in tier 1 and 2. The banks which were also anonymous as bank A- Q.

Mean and standard deviation of factors contributing to mobile fraud

Using five likert scale, respondents gave feedback on factors contributing to mobile financial fraud. Out of 15 factors contributing to mobile fraud, poor remuneration was rated highly at first position with a mean of 5.00 and standard deviation of 0.065, Pressure was second with a mean of 4.69 and standard deviation of 0.463, Celerity was third with a mean of 4.66 and standard deviation of 0.484, severity was forth with a mean of 4.65 and standard deviation of 0.516,weak policy was fifth with a mean of 4.63 and standard deviation of 0.550, certainty was sixth with a mean of 4.61 and standard deviation of 0.506, poor awareness was seventh with a mean of 4.43 and standard deviation of 0.671, seasonality was eighth with a mean of 4.41 and standard deviation of 0.746, information sharing was ninth with a mean of 4.07 and standard deviation of 0.617, high cost of transaction was tenth with a mean of 4.04 and standard deviation of 0.685, non-standardized processes was eleventh with a mean of 3.98 and standard deviation of 0.520, compliance monitoring was twelfth with a mean of 3.96 and standard deviation of 0.643, organization culture was thirteenth with a mean of 3.93 and standard deviation of 0.500, maturity of mobile money services was fourteenth with a mean of 3.84 and standard deviation of 0.788, interbank competition was rated least at the fifteenth position with a mean of 3.80 and standard deviation of 0.643.

The average mean and standard deviation for the 15 factors contributing mobile fraud are 4.31 and 0.560 respectively, this indicate the respondents agreed strongly that these factors truly contribute to mobile fraud. Summary of mean and standard deviation of factors contributing to mobile fraud are as shown in Table 1.0 below.

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Table 1.0 – Mean and standard deviation of factors contributing to mobile fraud in Kenya

Factors contributing to mobile fraud	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Poor remuneration	237	4	5	5.00	.004	.065
Pressure	237	4	5	4.69	.030	.463
Celerity	237	3	5	4.66	.031	.484
Severity	237	2	5	4.65	.033	.513
Weak policy	237	1	5	4.63	.036	.550
Certainty	237	3	5	4.61	.033	.506
Poor awareness	237	3	5	4.43	.044	.671
Seasonality	237	1	5	4.41	.048	.746
Information sharing	237	1	5	4.07	.040	.617
High cost of transaction	237	1	5	4.04	.044	.685
Non `standardized processes	237	1	5	3.98	.034	.520
Compliance monitoring	237	1	5	3.96	.042	.643
Organization culture	237	1	5	3.93	.032	.500
Maturity of mobile money services	237	1	5	3.84	.051	.788
Interbank competition	237	1	5	3.80	.042	.643
Valid N (listwise)	237			**4.31**		**.560**

Reliability Analysis

Dependability of the survey was checked through Cronbach alpha which is a factual instrument used to decide interior consistency of factors contributing to mobile fraud. The Cronbach's alpha value for fifteen factors/ constructs are all greater 0.5, which indicates strong/good level of internal consistency. Table 2.0 below shows the Cronbach's alpha value for each fifteen factors/constructs.

Table 2.0 - Reliability of Constructs

Factors contributing to mobile fraud	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Non standardized processes	60.71	20.428	.700	.822
Compliance monitoring	60.73	20.094	.605	.826
Interbank competition	60.89	20.124	.599	.826
Information sharing	60.62	21.169	.431	.837
Organization culture	60.76	20.361	.750	.820
High cost of transaction	60.65	20.346	.515	.832
Poor remuneration	59.70	23.907	.129	.847
Weak policy	60.06	21.873	.354	.841
Maturity of mobile money services	60.86	22.547	.110	.863
Poor awareness	60.26	20.167	.560	.829
Seasonality	60.28	19.060	.672	.820
Certainty	60.08	21.789	.412	.838
Celerity	60.03	21.846	.423	.837
Severity	60.05	21.824	.397	.838
Pressure	60.00	21.483	.535	.832

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5 CONCLUSION AND RECOMMENDATIONS

Determining factors contributing to mobile financial fraud within Kenya is considered a success because it leads to effective fraud management i.e. ability to detect, report fraud and ability to perform dedicated fraud control. During the study, researcher also noted that there exist other fraud management frameworks i.e. GAO framework and fraud detection framework. The existing frameworks have gaps like inability to manage fraud. All the mentioned gaps have been fully addressed by the developed enhanced framework for fraud in Kenya's financial industry hence the framework is considred a sucess. There is a need to do further research on how to achieve watertight privacy and confidentiality of fraudsters information shared since it will make the performance of the framework even much better.

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ACKNOWLEDMENT

My sincere thanks go to Jaramogi Oginga Odinga University of Science and Technology (JOOUST) administration and School of Informatics and Innovative Systems (SIIS) especially staffs for organizing this thesis opportunity. Great thanks go to my supervisors Prof. Solomon Ogara and Prof. Anthony Rodrigues for their constructive suggestions, co-operations, guidance, encouragement, invaluable discussions and concern both in development of initial programmes and the final preparation of this thesis report.
Finally, my sincere appreciation is due to my beloved ones i.e. my wife, parents, relatives, fellow colleagues and friends for their moral and financial support to be able to carry out this thesis. They denied themselves most of what they deserved to ensure I succeeded. So great indeed!!

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

PARENTAL INVOLVEMENT AND INFLUENCE IN THE DEVELOPMENT OF TALENTS FOR INDIVIDUALS WITH AUTISM SPECTRUM DISORDER. THREE MODERN CASE STUDIES

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Article DOI: https://doi.org/10.36713/epra12193
DOI No: 10.36713/epra12193

ABSTRACT

Individuals with ASD who display savant skills are a paradox. How can individuals with ASD, who appear to be intellectually challenged in their general independence skills, display savant skills that are far more developed than those of individuals with higher intelligence? What is it about ASD that predisposes individuals with ASD to savant skills? This paper examines the lives of three famous individuals who have autism spectrum disorder (ASD) and possess a diverse set of well-documented savant abilities. These individuals are Kim Peek, Leslie Lemke, and Matt Savage. Apart from Matt Savage, the other two individuals who display savant skills have low cognitive abilities and are unable to perform simple daily skills. Kim Peek, for example, was unable to perform general self-care tasks, such as combing his hair or dressing.

INTRODUCTION

Due to improved diagnostic tools and the expanded definition of ASD, the number of individuals diagnosed with ASD has increased over the past years (Hansen, Schendel, & Parner, 2015; Kroncke, Willard, & Huckabee, 2016; Rudra et al., 2014). Researchers (Bennett & Heaton, 2017; Finocchiaro, 2015; Hughes, 2012; Meilleur et al., 2015; Quirici, 2015; Simner et al., 2017 and Treffert, 2014) have implied that there is a higher incidence of savant skills among individuals with ASD.

There is no single theoretical framework that offers any logical explanation concerning individuals with ASD who display savant skills. A framework that attempts to explain this phenomenon is the weak central coherence theory, which suggests that a specific perceptual-cognitive style, loosely described as a limited ability to understand context, underlies the central disturbance in ASD (Happe, 2013; Riches, Loucas, Baird, Charman, & Simonoff, 2016; Vanegas & Davidson, 2015). One explanation offered by the weak central coherence theory is that for many individuals with ASD who exhibit savant skills, the manner in which they achieved their savant skill could be from preliminary and initial attention to certain details and segments. This initial attention would lead to the subsequent construction and assembly of integrated pictures, music, calendar structure and the attainment of foreign languages (Happe, 2013; Skorich et al., 2016; Vanegas & Davidson, 2015).

Case studies of individuals with ASD where parental support has played an important role in the development of their skills

Three famous individuals who possess a diverse set of well-documented savant abilities will be introduced. These individuals are Kim Peek, Leslie Lemke, and Matt Savage. Apart from Matt Savage, the other two individuals who display savant skills have low cognitive abilities and are unable to perform simple daily skills. Kim Peek, for example, was unable to perform general self-care tasks, such as combing his hair or dressing (Arnold, 2013; Gururangan, 2012; Hutchinson, 2013; Moran, 2010; Skuse, 2011; Treffert 2014; Wilson, 2016).

Kim Peek

Kim was a savant who had extraordinary abilities. The next few paragraphs describe Kim's life and savant skills (Arnold, 2013; Gururangan, 2012; Hutchinson, 2013; Moran, 2010; Skuse, 2011; Treffert 2014; Wilson, 2016).

Kim was the inspiration to the movie, 'Rain Man'. In the movie, the main character Raymond Babbitt was an individual with ASD who displayed savant skills. Kim was born on November 11th, 1951. When he was nine months old, the doctors who

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examined Kim Peek diagnosed him with severe intellectual disability. One doctor recommended that Kim's parents place him in an institution meant for individuals with special needs. Another doctor suggested that he undergo a lobotomy. Both suggestions were rejected by Kim's parents. Instead, Kim's parents placed him in their family home, where they took great care of him, while showering him with lots of love and attention (Treffert 2012; Wilson 2016).

Kim was taught to read by his parents. They spent many hours reading to Kim and would get him to track words with his finger. It was reported that when Kim was 18 months old, he was able to memorise books and stories from a single reading. Once Kim had memorised a book, he would proceed to place the book upside down on the bookshelf so that no one would try to read the book to him again as he had already memorized all the words (Broggart, 2014; Treffert 2012; Wilson 2016).

When Kim was six years old, he was able to recite entire paragraphs. At that age, he was also capable of memorising whole sets of encyclopaedias. Kim's parents attempted to enrol him in a mainstream school, but it was not a successful placement. Kim was unable to sustain his attention in class. His parents were informed by the school that his hyperactivity was disruptive and unsettling to others, and they were advised that Kim would not benefit from a formal school setting. Therefore, his parents decided to home-school Kim, engaging two retired schoolteachers to tutor and instruct him. Kim succeeded in completing his high school certification at the age of fourteen (Hutchinson, 2013; Treffert, 2012; Treffert, 2014; Wilson 2016).

Kim Peek memorised every word of nearly 12 000 books, including the Bible and the Book of the Mormons. He was able to read and memorize a full page in eight to ten seconds. Kim was so competent at calculations that he could sum a column of numbers in a telephone book. He was also capable of computing the mean of those numbers in seconds. He possessed a prodigious memory. Some of Kim's interests included history and world facts. He was also fascinated by movie trivia, sports facts, geography, the space programme, actors and actresses, the bible, church history, classical music and literature (Hutchinson, 2013; Van Leeuwen, 2015).

As an adult, Kim Peek attended a sheltered workshop meant for persons with special needs. In this sheltered workshop, Kim assisted with the payroll calculations. He was able to calculate and analyse the daily production earnings for each client in the sheltered workshop. Kim was able to achieve this feat without any reliance on calculators or computers (Babbitt, 2016; Treffert & Wilson, 2016; Wilson, 2016).

In 1984, while attending a conference organized by the National Association for Retarded Citizens (The ARC) in Arlington, Texas, Kim met a screenwriter by the name of Barry Morrow. Barry Morrow was captivated by Kim's savant skills and his meeting with Kim gave him the idea to produce the movie Rain Man where the main character was based on Kim. Due to the popularity of the movie Rain Man, Kim travelled to many conferences, made television appearances and was featured in documentaries and talks (Puchta, 2011; Treffert, 2011). Due to this publicity, Kim became more outgoing, animated and comfortable with personal interactions with others in the community (Peek & Hanson, 2007; Weber 2009; Wilson, 2016). Kim Peek passed away at the age of 58 on December 19th, 2009, from a heart attack (Hutchinson, 2013; Weber, 2009; Wilson, 2016).

Despite Kim's incredible abilities, he never learned simple self-help skills, such as brushing his teeth, combing his hair or buttoning his shirt, and was unable to manage everyday chores. His father assisted him in many of his self-help independence skills. As an adult, Kim Peek continued having trouble with hand-eye coordination and balance (Babbitt, 2016; Hutchinson, 2013; Kodjapashi & Baloyannist, 2011; Treffert & Wilson, 2016; Weber, 2009; Wilson, 2016).

Matt Savage

Born in 1992, Matt Savage is an individual with ASD who displays extraordinary musical abilities. The next few paragraphs will describe Matt's life and savant skills. When Matt Savage was a child, he could not tolerate being touched or hearing loud noises. At three years old, he was diagnosed with ASD. Matt's mother described Matt as a child who was dissimilar to other children in the community in terms of mannerisms and play skills (Bieber, 2007; Rogers, 2011). According to his mother, Matt was a difficult baby to care for as he slept very little compared to other babies. He was reported as having very strange and abnormal play habits. For example, Matt enjoyed lining up his toys in a specific arrangement. He was also repetitive in many of his play rituals. As a child, Matt had no friends as he had difficulties forming meaningful interpersonal relationships with his peers. His mother tried sending him for formal schooling when he was a preschooler but that proved unsuccessful. After spending two days at the preschool, Matt's mother was informed that the school could not manage or cope with Matt's behaviour and idiosyncrasies. She was encouraged to take him home (Bergmann, 2016; Christopher, 2013; Rogers, 2011; Solomon, 2013).

When Matt Savage was six and a half years old, he had already mastered playing the piano. He produced his first jazz CD when he was eight years old. When he was nine years old, he formed a music band called the Matt Savage Trio which performed in different places around the world. At that time, Matt had already recorded his seventh music CD. He even performed at the famous Blue Note jazz club in Manhattan, USA. (Bergmann, 2016; Christopher, 2013; Rogers, 2011; Solomon, 2013; Treffert, 2009). Matt was the youngest musician to have ever performed at this prestigious venue. When Matt was 11 years old, he was signed up as a Bosendorfer Artist. He was the youngest pianist to have received this honour in the history of the Bosendorfer Piano Company (Bieber, 2007; Rogers, 2011; Treffert, 2010).

Matt is a prolific musician and has a good memory. He is gifted with the art of calendar calculations and is able to predict the day that the person is born purely based on the date of that person's birthday. Like Kim Peek, Matt also has a fascination for

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EPRA International Journal of Research and Development (IJRD)
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certain topics, one of which was the subject of roller coasters. He is able to name the longest, fastest and highest roller coasters from around the world and is also able to state the different incline angles of the roller coasters (Solomon, 2013; Treffert, 2010).

Although most savants have IQs below 70, Matt's IQ is above average. In 2009, Matt was asked to pen the theme song for the Aid 4 Autism concert held in Atlanta, Georgia. Matt titled his song, I'm not afraid. While the musical expertise of savants is usually confined to playing thousands of songs from memory in a stiff and mechanical fashion, Matt is a prolific composer and skilled improviser (Bergmann, 2016; Christopher, 2013; Rogers, 2011; Solomon, 2013; Treffert, 2010).

Matt has become an accomplished musician and as an adult, he is acknowledged as the "Mozart of Jazz", a title that was given to him by the world-famous jazz musician Dave Brubeck (Christopher, 2013). Currently, Matt performs in the United States at concerts and jazz festivals. Much of his earnings from the sales of his music and appearances go into ASD-related research and organisations that support special needs. His reputation as a jazz musician continues to grow worldwide, with many of his performances available for viewing on YouTube (Rogers, 2011; Solomon, 2013; Treffert, 2010). In the summer of 2009, Matt attended the Stanford (University) Jazz Residency in California. Matt also attended Berklee College of Music in Boston in 2009, being the second music savant to attend this institution (Christopher, 2013; Savage, Edelson, & Rimland, 2003; Solomon, 2013; Treffert, 2010).

Leslie Lemke

Leslie is a music savant who has extraordinary abilities despite being blind and cognitively challenged. The next few paragraphs describe Leslie's life and savant skills. Leslie was raised by his foster mother, May Lemke. Leslie was born prematurely on January 31st, 1952. He developed an eye condition called retrolental fibroplasia, a type of blindness that is often associated with premature babies. In this condition, the retina grows quickly and in Leslie's case, it started to block the drainage in the eye, resulting in glaucoma. There was increasing worry that Leslie's left eye was going to burst because of the added pressure from the retina. It was recommended that his left eye be removed. Six weeks later, the right eye was also surgically removed due to the same condition. Leslie has difficulties with his gross and fine motor skills, and also suffers from cerebral palsy (Grandin & Panek, 2013; Strauss, 2014; Treffert, 2009; Treffert, 2014; Wilson 2016). Through much patience and effort, May Lemke taught Leslie how to walk. She also taught him to eat and swallow his food by placing small amounts of food in his mouth and massaging his throat to induce the swallowing action (Strauss, 2014, Treffert, 2014; Wilson 2016).

Despite all his physical and cognitive impairment, Leslie was able to play Tchaikovsky's Piano Concert No. 1 flawlessly after hearing it for the first time when he was just fourteen years old. Leslie is a musical virtuoso despite never having had a formal music lesson in his life (Strauss, 2014; Treffert, 2009; Treffert, 2014; Wilson, 2016). He plays and sings thousands of music pieces and is also able to improvise and compose music (Darius, 2010; Treffert, 2004; Treffert, 2014; Wilson, 2016). When Leslie was seven years old, he was given a piano. May painstakingly taught him to play the piano by putting her hands over his. She initially taught him some simple tunes. By the age of eight, he was able to play the bongo drums, ukulele, concertina, xylophone and accordion. At nine years old, he mastered the chord organ (Christopher, 2013; Strauss, 2014; Treffert, 2014; Wilson, 2016).

As much as Leslie was becoming a prolific musician, he is still not able to hold a conversation and his speech consists of mainly echolalia. Till today, Leslie requires assistance with his self-help skills and because of the cerebral palsy in his hands, he never mastered the ability to dress independently. However, the spasticity in his hands ceases when he plays the piano or other musical instruments. Leslie shows no emotions except when he is playing the piano (Darius, 2010; Strauss, 2014; Treffert, 2014; Wilson, 2016). He is able to reproduce any piece of music, regardless of its length or complexity (Christopher, 2013; Strauss, 2014; Treffert, 2014; Wilson, 2016).

As he grew older, Leslie became more verbal and musically accomplished. He became progressively more creative, imaginative and entertaining (Strauss, 2014; Treffert, 2014; Wilson, 2016). On several occasions, after performing a musical piece he had heard, he would launch into an improvisation of the piece. He is known to have composed songs on the spot and sings with a baritone type of voice. His verbal IQ has been rated at 58 (Darius, 2007; Strauss, 2014; Treffert 2014; Wilson, 2016).

By 1980, Leslie was regularly giving concerts in Fond du Lac, Wisconsin. His newfound fame drew invitations to television shows such as CBC's Man Alive, the CBS Evening News, 60 Minutes, and That's Incredible! In 1983, ABC broadcasted the movie called The Woman Who Willed a Miracle. It was a family drama about Leslie and his adoptive mother, starring Cloris Leachman as May Lemke. Leslie is also the subject of Fred Small's song, Leslie is Different. Leslie continues to tour around the world and has given free concerts (Christopher, 2013; Strauss, 2014; Treffert, 2014; Wilson, 2016).

Leslie now lives with May's daughter, Mary Parker, in Arpin, Wisconsin. There was some apprehension and anxiety that Leslie may stop playing or performing with the passing of his foster mother, an occurrence which has happened to some savants in the past. This did not happen to Leslie and he continues to play and perform in concerts. In a way, music is Leslie's language and a conduit toward normalization for him (Strauss, 2014; Treffert 2014). With his music Leslie appears more animated and energetic. He will smile and talk when he is asked about his music. His sense of humour appears when the topic of music is discussed and when he is asked to play different pieces of music. On some occasions, Leslie has composed new songs with his own words, lyrics and sound effects. His repertoire and collection of musical talents seem unlimited and his ability to remember

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
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all the songs or music pieces that he had performed seems limitless. Many professional musicians marvel at his innate and inborn knowledge of music.

CONCLUSION

Savant skills are talents worth nurturing. Learning more about individuals with ASD who have savant skills will broaden our understanding of how we can help them with language acquisition, social skills, as well as self-help and independence skills. Drawing on their areas of interests and talents, the school curriculum and instructional methods could be tailored to suit their learning needs.

For experts in the field of ASD, savant talents amongst individuals with ASD are a fascinating yet challenging phenomenon (Bennett, & Heaton, 2017; Biever, 2009; Clark, 2016; Crow, 2010; Treffert, 2014). There are individuals with ASD who have challenges in their mental ability and self-help skills, where they need to be assisted by others, and yet these individuals have demonstrated specific skills in a particular domain that surpass many individuals of normal intelligence (Bennett, & Heaton, 2017; Clark, 2016; Treffert, 2014). According to studies, there are individuals with ASD who possess extraordinary areas of brilliance that is above the general population (Bennett, & Heaton, 2017; Treffert, 2014). These areas of brilliance could be displayed through their savant skills in mental calculations, calendrical calculations, art, music and exceptional memory (Bennett, & Heaton, 2017; Treffert, 2014).

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EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

THE CONCEPT OF DYSPHEMISM IN FRENCH

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ABSTRACT
This article reviews the definitions given to dysphemism in French linguistics, the contrast of dysphemism to euphemism as a stylistic tool, and the opposite of its function. It is emphasized that the concept of dysphemism is close to the concept of dysphemism by the limitation of "slang" and "vulgarism", and the fact that slang and vulgarisms are used to express anger, negative evaluation and attitude. The five most common lexical-semantic categories of dysphemism are also discussed.
KEYWORDS: *dysphemism, euphemism, dysphemia, cacophenism, pure dysphemism, contextual dysphemism, slang, slang, vulgarism.*

1. INTRODUCTION

According to investigations of sociologists and linguists, the beginning of the 21st century is characterized by an intensification of negative meaning in speech communication [1, pp. 352-357]. It seems naturally, that negative and offensive words are used in disagreements and conflicts between social and ethnic groups in society, between authority and people. The phenomenon of dysphemia has not been researched as deep as the phenomenon of euphemia. The reason for this, is that dysphemia includes some linguistic elements forbidden by the moral principles of society. Often dysphemism understood inversely to euphemism and is defined with euphemism [2, pp. 240].

The first definition of a dysphemism in linguistics was given by I.R. Halperin in his monograph, on stylistics of the English language says: "Dysphemisms or cacophoenisms are stylistic techniques contradicting euphemism and overturning its function. They express a concept in an unliterary form, harshly and crudely". [3, pp. 166].

T.V. Boiko understands a dysphemism as a rougher lexical unit. The scientist defines a dysphemism as: "A coarser lexical unit than the initial nomination, which the speaker prefers in order to express his negative attitude and pejoratively influence the recipient" [4, pp. 21].

The linguist also says that the concepts of "dysphemism", "slang" and "vulgarism" should be distinguished and stresses that "slangisms" and "vulgarisms" are close to the concept of "dysphemism" due to the fact that they are used to express anger, negative evaluation and attitude [5, pp. 29].

A number of scholars who have studied dysphemisms pragmatically have come to the conclusion that "in dysphemisms a negative meaning is added to the denotatism without changing its characteristics". [6, pp. 352-357].

The views on dysphemism are also found in the studies of some Russian scholars. In these scientific works, a dysphemism is defined as a socially marked unit [7, p. 320], rude, common, broken speech [8, pp. 240], stylistically marked, defective, non-normative vocabulary or expression beyond manners [9, pp. 73-79].

2. LITERATURE REVIEW AND DISCUSSION

The phenomenon of dysphemia has not been studied as deep as euphemisms, and in French linguistics this concept has not been a separate object of study. When we turned to the etymology of the concept of "dysphemism" in French, we got acquainted with this information:

(XXe siècle) Construit sur le modèle de euphémisme par substitution du préfixe dys- au préfixe eu-. Mot de formation savante forgé à partir du grec ancien δυσφημισμός, dysphêmismos (« emploi d'un mot défavorable »), composé de δυσ, dys (« difficile, mauvais, négatif ») et de φήμη, phêmê (« parole ») [site]

It is a 20th century term made up of two ancient Greek compound words – "dys" – "difficult, bad, negative" and "phêmi" – "speak". The opposite of euphemism means "bad speech".

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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The Spanish linguist Da Silva Correa calls the concept of dysphemism "cacofemismo" , "contra-eufemismo", "anti-eufemismo". [10, pp. 445-787]. Linguist Grant describes dysphemism as "mot fort" – "strong words" or "malphemism" – "speaking badly", which includes all bad vices, including rudeness, hatred, mockery, blasphemy, etc. [11, pp. 246-253].

Studies on the nature of dysphemia have shown that the question of the classification of dysphemia remains open. Nevertheless, we will consider a number of existing classifications of dysphemisms.

The linguistic scientist A.N. Rezanova classifies dysphemisms according to lexico-semantic categories. Herewith, she singles out five lexical-semantic categories reflecting attitudes in modern society, where dysphemisms are more widespread [12, pp. 278-280]:

Category 1: dysphemisms denoting the concepts of death, disease, physical and mental disabilities.

This category is extensive and is reflected in the synonymic row of dysphemisms, which is constantly updated. Historical and cultural preconditions determine the tendency of further growth of dysphemisms of this lexico-semantic category. Among these prerequisites, the most clear ones are:

- due to certain social and political events in the world, increased feelings of anger and hatred, which are emotional states in society;

- a lack of spirituality in the general public in the masses.

1.Clamser v.i. (mourir) (*die,commit suicide)*:

La déprime se rabat sur moi, j'en ai ras le cul de vivre en ce moment, j'ai trop envie de ***clamser.*** (Depression is falling on me, I'm fed up with living at the moment, I **want to kill myself**).

2. Chtarbé-e, adj. et n. (Fou, dingue) *(crazy)*:

Il y a beaucoup de cinéastes que j'aime bien. Sauf que je ne retiens même pas leur nom. Bon, si, il y a Tarantino, qui est un peu ***chtarbé.*** (There are a lot of filmmakers that I like. Except that I don't even remember their name. Well, yes, there is Tarantino, who is a bit **crazy**).

Category 2: Dysphemisms in the region of criminal

Signs of such dysphemisms are associated with various areas of criminal activity: murder, prostitution, money laundering, drugs, etc.

Such problems have always been stigmatised in society, so they are expressed through euphemistic exchanges. But now there is a growing tendency to "call things by their proper names". Consequently, this category is prolific and is constantly recruited with new slangisms and vulgarisms.

Category 3: Dysphemisms denoting human flaws and lacks.

The linguist scientist connects the emergence of this category of dysphemisms to the fact that private life is increasingly becoming a public object, many people reveal "dark" sides of their nature and, as a consequence, become the subject of discussion in society. This lexical group can be considered the most numerous in terms of the quantity of dysphemisms.

1. Bourré-e, adj. (ivre) (drunk):

Tu ne mets pas le A, tu roules avec ta voiture de boîte, en plus ***t(u) es bourré*** *voilà c'est ça, ton histoire en gros.* (You don't put the A, you drive with your box car, in addition **you are drunk,** that's it, your story basically).

2. Beurré-e, adj. (ivre) (drunk, buttered): *Il est revenu complètement* ***beurré*** *du bistrot*. (He came back completely buttered from the bistro).

3. Soûlard, n. (personne qui a l'habitude de s'enivrer) (person who is used to getting drunk) (so**û**l, so**û**le) (drunk): *Il était* ***soûl*** *comme un cochon*. (He was **drunk** as a pig).

Je reviens dans une heure, occupe-toi bien de ton ami ***le soûlard****. Il me dégoûte.* (I'll be back in an hour, take good care of your **drunk friend.** He disgusts me).

Category 4: Dysphemisms denoting nationality.

Dysphemisms of this category are very frequent. In the modern political environment the mentioning of "abnormality" peculiar to this or that nation causes a sharp protest of the members of the society. Units of this lexical group, regardless of the speaker, are always considered as dysphemisms, as such taboo words are spread to all members of society.

1. Chintoque, n. (Terme injurieux, voire raciste, désignant un Chinois ; par extension, toute personne asiatique) (Abusive, even racist term, designating a Chinese; by extension, any Asian person).

Purée ***les chintoques*** *sont tellement plates, je suis jalouse.* (**Mashed** potatoes are so flat, I'm jealous).

2. Espingouin, adj. et n. (Péjoratif: Espagnol. Étym. Déformation du mot espagnol combiné avec le mot pingouin).

Moi, je me fight toujours avec la prof ***d'espingouin****, elle me saoule.* (Me, I always fight with the penguin teacher, she pisses me off).

Category 5: Dysphemisms denoting God, devil, and words and swearwords related to various religious rituals.

The use of words and phrases related to religion is very common. However, it is very difficult to determine whether these words or phrases are dysphemisms. During her research, the author shows two reasons for the use of dysphemisms in religious semantics. Firstly, their use is related to the emotional state of the speaker conditioned with frustration, rage, anger and other

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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negative experiences. Secondly, dysphemisms linked with theology are used when the speaker opposes religion, rebukes it, mocks it or deliberately blasphemes it by denying the existence of God.

3. RESULT

In the final part of the study, the author stresses that the above classification has no end, that speech norms are ordered in the process of social development, as well as the expansion of the taboo sphere and dysphemic vocabulary [13, pp. 280]. Moreover, A.N. Rezanova divides dysphemisms into pure and conditional (depending on the context) dysphemisms [14, pp. 10].

To pure dysphemisms attributed words with a pejorative character regardless of the context.

– Mais qu'est-ce que tu vas faire? Tu vas le rejoindre? Tu vas être la putaine d'un rat d'égout?
– Je préfère être sa putaine que ta femme! (Film "Titanic", La conversation entre Rose et Carl)

- But what are you going to do? Are you going to join him? You gonna be fucking a sewer rat?
- I'd rather be his whore than your wife! (Movie "Titanic", The conversation between Rose and Carl)

Conditional (depending on the context) dysphemisms include any lexical units with a pejorative character (jargonisms, slangisms, proverbs, etc.), which are considered as dysphemisms only under certain contextual conditions.

1. – Et voyez maintenant comme elle aime les bêtes!
– And now see how she loves animals! [Alphonse de Lamartine, 1790-1869]
2. Elle n'est pas bête, elle est loin d'être bête. – She's not dumb, she's far from dumb.
3"Quelle bête es-tu?" – "How you are stupid?"
4. Cette femme est sa bête noire! – This woman is his pet peeve!

In addition, there is also a semantic-pragmatic classification of dysphemisms by linguists A.A. Gaeva and A.H. Nikitina, in which dysphemisms are divided into lexical and phraseological, and each of these groups is divided into three more subgroups: contextual, semantically derivatives and original dysphemisms [15, pp. 15].

Contextual dysphemisms include neutral lexical, meliorative phraseological expressions related to some context and expressing such feelings as displeasure, disgust, contempt. In other words, the lexemes or idioms have a certain negative meaning, while their basic meaning does not change.

The group of semantically derivative dysphemisms includes lexemes and phrases. However, in their direct meaning they are not lexical resources expressing negative thoughts such as humiliation, discredit, irony, but in a figurative sense they express emotional and expressive coloring, which is characteristic of dysphemisms, and convey the meanings listed above.

The third type is real dysphemisms, which regardless of the context have a characteristic semantics in the main meaning of the word. This group includes conversational words, as well as swear words and obscene words (lexicons).

4. CONCLUSION

Consequently, these classifications are mainly based on the semantics of dysphemisms. We can say that the semantic-pragmatic classification of dysphemisms (phraseological and lexical dysphemisms) by linguists A.A. Gaeva and A.H. Nikitina complements the classification of pure and conditional (depending on the context) dysphemisms by scientist A.N. Rezanova.

The newest research of the phenomenon of dysphemisms made it clear that the group of dysphemisms includes not only crude or vulgar units, but also neutral words used in a particular speech situation to perform a communicative task, as well as the improved vocabulary.

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IMPACTS OF SPECIFIC DRILLS ON SKILL PERFORMANCE VARIABLES AMONG GRASSROOTS LEVEL BASKETBALL PLAYERS (A Pilot Study)

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ABSTRACT
The idea of the study was to find out the impacts of specific drills on skill performance variables among grass root level basketball players. To achieve the purpose of the study, five grass root level basketball players would be randomly selected from National Sports School, Coimbatore district and their age ranged between 12 and 14 years. Single group design. Specific drills pilot study group (n = 5) would be undergone for a period of four weeks. The results revealed that there was a significant difference found on the criterion variables. The difference was found due to specific drills given to the experimental group on dribbling, shooting and passing of basketball players.
KEYWORDS: *Specific drills, Dribbling, Shooting, Passing and Basketball Players.*

INTRODUCTION

Basketball is one of the fastest games in which high level conditioning and coordinative abilities with technical and tactical potentials are essential to perform every skill at desired or required level. In basketball is a same agile. Specific skill training is a program includes performance training designed specifically for athletic performance enhancement. Training programs for game performance enhancement could include such areas as dribbling, passing, shooting and other than to developing in, speed, power, endurance, flexibility, mobility, agility, mental preparedness (including goal setting), sleep, recovery/regeneration techniques and strategies, nutrition, rehabilitation, and injury risk reduction. A general program should include all of these components and a more specific program may only include a few, depending upon the athlete's specific needs (based on strengths, weaknesses and/or imbalances) and the demands of the sport they participate in. Sports performance training is exercising with the specific goal of improving your effectiveness as an athlete in your particular sport. Specific training might get someone in general shape and have them improve as an athlete somewhat. In sport, the team training refers the set of physical exercise used to develop either physical or motor fitness aspects of a player. When the training for players at higher level or above the basic level, they have to trained with specific objectives in sport, the training program should designed specifically based on the components that are needed for the skill or technique in sport. Thus such type of specific skill training program is a need for the player to excellent in sport. Thus the present study has been carries out to study the impacts of specific drills training on skill performance variables among grass root level basketball players.

METHODOLOGY

The idea of the study was to find out the impacts of specific drills on skill performance variables among grass root level basketball players. To achieve the purpose of the study, five grass root level basketball players would be randomly selected from National Sports School, Coimbatore district and their age ranged between 12 and 14 years. Single group design was used. Specific drills pilot study group (n = 5) would be undergone for a period of four weeks.

CRITERION MEASURES

The subjects of specific drills pilot study would be assessed on the selected variables by the standardized test items before and after the training period of four weeks.

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Table -I

S.No	Criterion Variables	Test Items	Unit of Measurements
Performance Variables			
1	Dribbling	Johnson Basketball Test	Points
2	Passing		Points
3	Shooting		Points

TRAINING PROGRAMME

The training program was lasted for 60 minutes for session in a day, 3 days in a week for a period of six weeks duration. These 60 minutes included 10 minutes warm up, 40 minutes respective training and 10 minutes warm down procedure. Every three weeks of training 5% of intensity of load will be increased from 65% to 80% of work load. Volume of training was prescribed based on the number of sets and repetition.

STATISTICAL TECHNIQUES

The data are analyzed by paired 't' test was used for assessed the impacts of specific drills skill performance variables among grass root level basketball players. The significance level was fixed at 0.05 level of confidence which is considered to be the appropriate one for this study.

RESULTS

Table-II

Relationship of Mean, SD and't'-Values of the Dribbling, Shooting and Passing between Pre & Post Test of the Specific Drills of Basketball Players

	Variables	Test	Mean	S.D	't' Values
Specific Drills Group	Dribbling	Pre Test	19.20	1.64	10.61*
		Post Test	21.80	2.16	
	Shooting	Pre Test	14.00	3.16	9.48*
		Post Test	17.00	3.53	
	Passing	Pre Test	14.60	2.07	7.48*
		Post Test	17.40	1.81	

*Significant at 0.05 level of confidence

Table-II reveals that the obtained mean values of pre test and post test scores of specific drills group were 19.20 and 21.80, 14.00 and 17.00, 14.60 and 17.40 respectively; the obtained t ratio was 10.61, 9.48 and 7.48. The required table value is 2.77 at 0.05 level of confidence for the degree of freedom 4. The obtained t ratio was greater than the table value. It is found to be significant changes in dribbling, shooting and passing of the basketball players. The mean values on specific drills group are graphically represented in figure-1.

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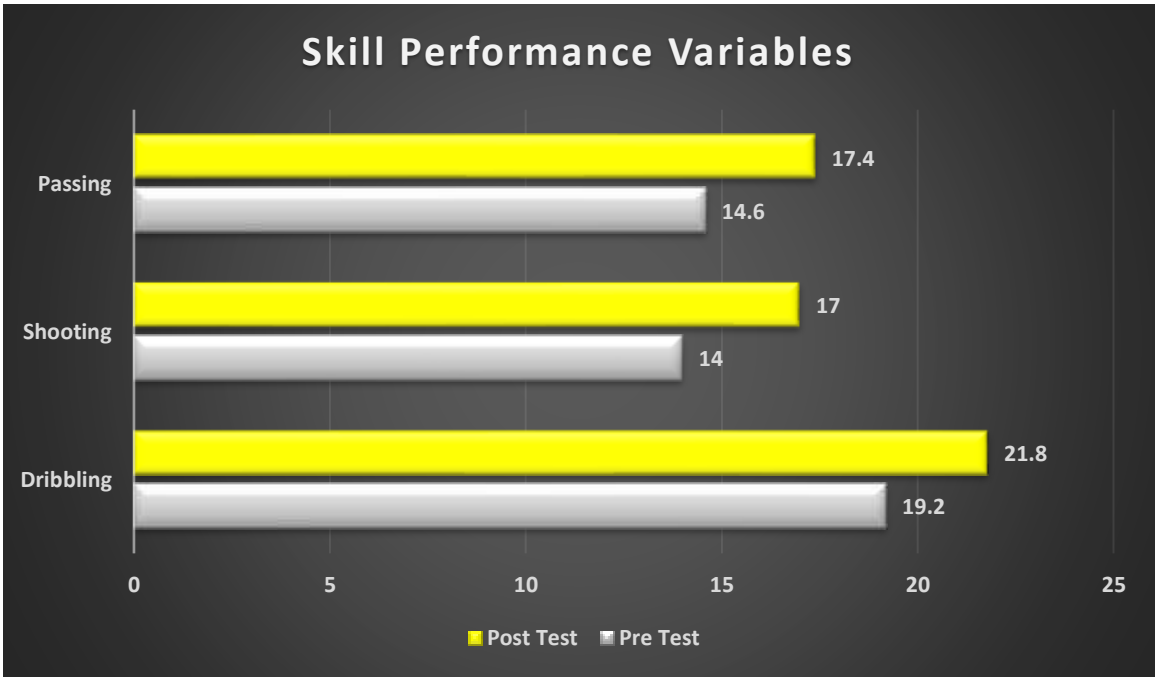

FIGURE-1: BAR DIAGRAM SHOWING THE PRE TEST & POST TEST ON DRIBBLING, SHOOTING AND PASSING OF SPECIFIC DRILLS

DISCUSSION ON FINDINGS

The specific drills are a fantastic training which has been found to be beneficial of the basketball players. To study the specific drills on dribbling, shooting and passing of basketball players at grassroots level, it was tested under to specific drills group. The specific drills includes on dribbling, shooting and passing. The specific drills are namely crossover dribble, semicircle dribble, scissors and dribble figure 8. It also improves the dribbling ability, game tactics, anaerobic capacity, quickness and eye hand coordination and other than some physical fitness components are namely speed, agility, and power. The obtained result proved positively the specific drills group significantly improved. The result of the present study showed that the specific drills have significant improvement on dribbling, shooting and passing ability of basketball players. The results of the study are in line with the studies of **Ascender.,et al (2019)[1] and Marcolin., et al (2018)[2].**

CONCLUSIONS

Based on the findings and within the limitation of the study it is noticed that practice of specific drills helped to improve dribbling, shooting and passing ability of basketball players at grassroots level. It was also seen that there is progressive improvement in the selected criterion variables of specific drills group of basketball players after four weeks of specific drills programme. Further, it also helps to improved dribbling, shooting and passing.

It was concluded that individualized impacts of specific drills group showed a statistically significant positive sign over the course of the treatment period on dribbling, shooting and passing of grassroots level basketball players.

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EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

DRUG-DRUG INTERACTIONS

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Article DOI: https://doi.org/10.36713/epra12202
DOI No: 10.36713/epra12202

ABSTRACT

Drug-drug interactions, dietary interactions, and other factors may cause a drug's effect on a person to differ from what is anticipated. Beverages and dietary supplements that person consumes (drug-nutrient/food Interaction) or a different illness the person is suffering from (drug-disease interaction). A when a substance impacts a drug's activity, it is said to be a drug interaction. i.e., the effects change or produce a new impact that neither generates on its own. These interactions could happen by cchanceabuse or a lack of understanding of the relevant substances' active components. Physicians and pharmacists are aware that various meals and medications can interact when consumed together in terms of food-drug interactions might affect the body's capacity to utilize a specific diet or medication, or can result in significant adverse consequences. Interactions between clinically significant drugs that could be harmful alterations in pharmacokinetic, pharmacological, or other factors may affect the patient.or their Pharmacodynamic qualities. Some people might be exploited to the adverse drug events are sometimes caused by drug interactions, however this is less common. As a result, it is recommended that patients adhere to their doctor's and physician's orders.

To achieve the most advantages with the fewest food-drug interactions. The literature survey was carried out by obtaining information from various reviews. And innovative works on general or particular medication and food interactions. This review provides details on the various ways that meals interact with one another.Indrug-drug provide patients with the greatest possible benefit, doctors and pharmacists must carefully choose which medications to prescribe.

KEYWORDS: *Absorption, adverse drug reaction, distribution, drug-drug metabolism, interactions, and excretion.*

INTRODUCTION

Drug-drug interactions (DDIs) are common, expensive, and a major factor in morbidity. Worldwide mortality [1] as well. Only in the United States, DDIs account for 20% of all Unwanted medication effects [2]Many health issues can be treated and resolved with medicines. They must, however, be Taken. Properly to guarantee their effectiveness and safety. Medications need to be very careful. Specific in their effects, predictable in their outcomes for all patients, and never be completely affected by concomitant food or medication, have linear potency, and Contains no hazardous ingredients at any dosage and just needs one dose to provide a long-lasting cure. However, this optimal medication has yet to be found [3].

Numerous medications contain ingredients that interact with the body In various ways. Drug use can occasionally be significantly impacted by diet and lifestyle choices. An instance when substance influences a drug's activity is known as a drug interaction. i.e., the effects are boosted, lowered, or they create a brand-new impact that neither of the previous two produces independently. Usually, drug interactions spring to mind (drug substance interaction). However, interactions between medications and meals are also possible drug-food interactions. In addition to prescription medications and other remedies (drug-herb interactions).these can happen as a result of careless usage or ignorance of the active components In the relevant substances. Inadvertent drug effect reduction or enhancement may result from diet and drug interactions. Some frequently alcohol, used herbs, and fruits can all contribute to the therapy's failure. to significant changes in the patient's health. 90% of clinically significant food-induced variations in the bioavailability of drugs are what lead to food drug Interactions. about the medicine. Some diet (food) medications' significant adverse effects include changes in absorption by fiber-rich, high-protein diets.[4] biological availability is an essential pharmacokinetic factor that is related to the therapeutic impact of most Drugs. However, the impact of food intake on the therapeutic effect of the drug must also be quantified in order to assess the clinical relevance of a food-drug Interaction.

Interactions connected with are the most crucial a high chance of treatment failure brought on by a markedly decreased bioavailability federated state.Chelation frequently results in such interactions. Have food-related components. Moreover, the body's reaction

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

to food consumption, Particularly, The bioavailability may be increased or decreased by gastric acid secretion. of particular medications. [5,6] pharmacokinetics can be changed by drug interactions. and/or pharmacodynamics of a drug.

The effects of a drug's Pharmacodynamic interaction may be antagonistic, synergistic, or additive. Drug interactions (Dis) are a significant but underappreciated cause of medication mistakes. The concurrent use of additional medications that,[3] have a wide surface area upon which the drug might be absorbed,[4] bind or chelate,[5] alter stomach pH,[6] alter gastrointestinal motility, or[7] impact transport proteins such as P-glycoprotein, may affect the gastrointestinal absorption of pharmaceuticals. Clinically rarely is a drug's absorption rate reduced alone.whereas a decrease in the amount of absorption will be clinically significant if it causes serum levels that are below therapeutic levels. [7] Extrapolating data from in vitro to the human situation can be challenging since factors such nonspecific binding, atypical kinetics, low effector solubility, as well as varied accessory protein ratios, may affect an enzyme's kinetic activity. [8] Coenzyme Q-10 (CoQ10) is widely taken as a nutritional supplement.

Selection of doctors: We selected participants from a list of more than 25,000 PCPs that was nationally representative. Medical association workforce databases and list serves, hospital organization physician rosters, and participants of national medical conferences were some of the resources used to construct the recruitment lists. We invited randomly chosen physicians from the assembled list between may and July 2018. A physician questionnaire of 20 questions was used to assess the participants' eligibility. Up till 330 doctors were included in the study sample, doctors who met the eligibility requirements were invited to take part.because it is acknowledged by the general people as a crucial component for sustaining human health. P-glycoprotein (P-gap), an intestinal efflux transporter, is hampered by it as a result, drug-food interactions occur.[9] drug and natural product interactions is a typical concealed issue seen in clinical practices. The exchanges the same pharmacokinetic principle underlie both natural compounds and pharmaceutical. principles of pharmacodynamics as they relate to medication Interaction agents that have recently been discovered to alter drug-metabolizing enzymes.[10]
The most well-known example is grapefruit, but other fruits like star fruit, pomelo, and civilian oranges all contain substances that inhibit CYP3A4, the most significant enzyme in drug metabolism[11].

EVALUATION AND IDENTIFICATION OF DRUG-DRUG INTERACTION

Material and procedures

From May to July 2018, we conducted a prospective, cross-sectional research of DDI preventive care practices among PCPs working in the US. Board-certified family and internal medicine doctors treated identical simulated patients known as Clinical Performance and Value (CPV®) vignettes as we assessed their DDI screening, workup,and care recommendations.

Ethics

This research complied with ethical guidelines, was authorized by theAdjaraInstitutional Review Board in Columbia, Maryland, and was registeredwith clinicaltrials.gov (NCT03581994). All participants gave their informed consent.

Selection of doctors

We selected participants from a list of more than 25,000 PCPs that was nationally representative. Medical association workforce databases and list serves, hospital organization physician rosters, and participants of national medical conferences were some of the resources used to construct the recruitment lists. We invited randomly chosen physicians from the assembled list between may and July 2018. A physician questionnaire of 20 questions was used to assess the participants' eligibility. Up till 330 doctors were included in the study sample, doctors who met the eligibility requirements were invited to take part.

Physicians must treat patients

They would in an office environment in order to provide for their needs in Clinical Performance and Value vignettes: simulated patients [12] By using the technology, doctors can simulate a real patient visit by asking questions, reviewing medical records, and ordering tests and procedures in the lab. the five domains of care for open-ended questions in the CPVs are as follows: Taking a history, having a physical exam, ordering a diagnostic test, and 4) Establishing a diagnosis, followed by 5) a treatment strategy and follow-up. Between 49 and 72 evidence-based criteria are reviewed for each instance. Two doctors separately scored each case using clear, predetermined criteria, with a third doctor making decisions in the event of a tie on any one of the particular criteria. Thus, a score between 0% and 100% is assigned to each domain as well as the overall performance. a clear measurement of clinical practice variance is provided by CPV vignettes, whichaccount for case-mix variation because all doctors are treating the same patients.

Evaluation of current DDI

Evaluationprocedures and identification of challenges and potential for DDI prevention in the primary care environment were the main outcomes of the analysis. In more detail, we sought to: 1) ascertain the frequency with which PCPs were able to recognize, classify, and treat DDIs in simulated CPV patients; and 2) assess the influence of provider characteristics (e.g., age, gender, practice setting) and clinical practice characteristics (e.g., inquiring about medication history, ordering a presumptive or definitive

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drug test) on the likelihood of DDI diagnosis and treatment. For studies involving binary outcome variables (such as diagnosing a DDI), chi-squared tests and logistic regression modelling were employed; for analyses involving continuous outcomes, t-tests and linear regression modelling were utilized (e.g., diagnosis-treatment score).

MECHANISM OF DRUG-DRUG INTERACTION

Two part of mechanism of action

- Pharmacokinetics interaction
- Pharmacodynamicsinteraction

Pharmacokinetic Interaction

In this interaction, drug affect the absorption, distribution, metabolism and elimination of drug.

IN thisinteraction, one agent altering the absorption, distribution. If there is delaying in the absorption of drug then there is decrease in plasma concentration level, reducing effect or sometime prolonged the onset of action variables involved in alteration of absorption are follows[**13**]

- **ABSORPTION**

1. Alteration gastrointestinal absorption
    - Complexation.
    - Altered gastric PH.
    - Food.
    - GIT flora.
    - Inhibition of GI enzyme.
    - Complexation/chelation/Adsorption:
      Example of alteration in absorption process by Complexation formation are chelation between antacids and tetracycline, tetracycline with metals.
    - Altered GT Transit/emptying:

Absorption of drugs also affected by alteration in GI Transit or emptying rate. the drugs which affecting the GI Transit time administered with other influences the absorption process.Ex. Administration of acetaminophen with anticholinergics delay in absorption process of acetaminophen.

- Altered Gastric PH

Non-ionized drugs get more readily absorbed than ionized drug.in acidic environment of stomach, acidic drugs are available in the form of non-ionized state so, it rapidly absorbed while in alkaline environment (intestine) acidic drug become ionized and the further absorption get reduced basic drugs in contrast and these are readily absorbed from the gastrointestinal tract than from the stomach.the drugs that alter the PH of DIT may modify the absorption of subsequently administered drugs.

Ex. Administration of H2 blocker along with ketoconazole'sdecrease the dissolution rate of ketoconazole resulting in reduced absorption.

- Food

In stomach, presence of food influence the absorption of number of drugs.

The food also reduces the absorption of drug by binding with it or by changing the PH of GI content or changing dissolution rate of drugs.

Presence of food in stomach reduces the absorption of penicillin, erythromycin, rifampicin.

So, it recommended that antibiotics should be given at least two hours after or one hour before the meal to achieve optimum absorption.

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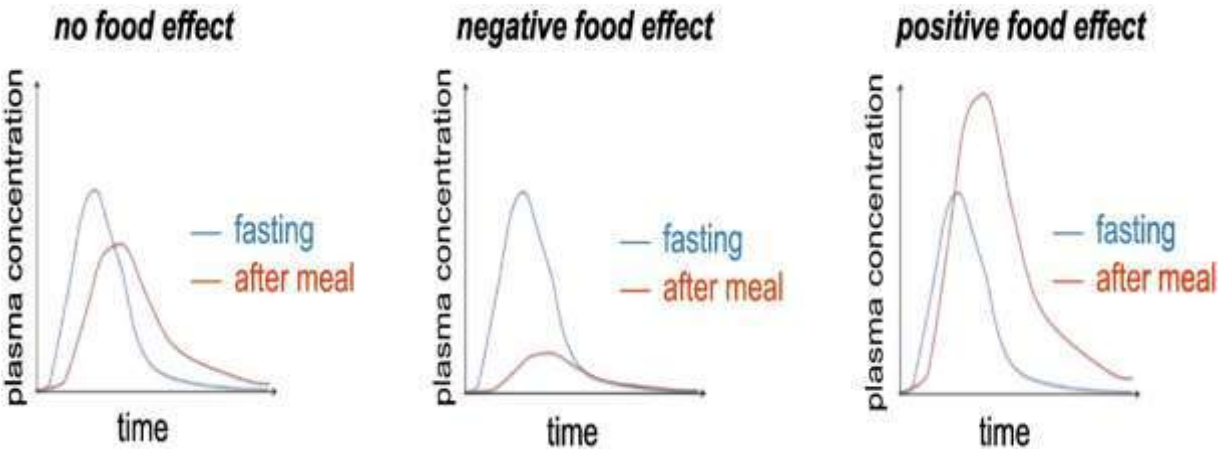

- Gastrointestinal flora

Certain antibiotics may enhance the response of anticoagulants by altering thegastrointestinal flora and thus interfering with vitamin k synthesis and results to alter in the efficiency of anticoagulant.

Inhibition of GI Enzyme:

The absorption of certain drugs depends on their metabolism by the enzyme.If these enzymes are inhibited then the absorption of drugs also decreases.Ex. Administration of folic acid along with phenytoin decrease the absorption of folic acid In the diet folic acid is present in the formula of polyglutamate which is poorly soluble.

1. Alteration in distribution:

Interactionsin plasma protein binding:

These types of interactions are more significant when the two drugs are capable of binding to similar site on the protein. The drug which has greater affinity for binding positions will dislocate the other from plasma protein.

Ex. In administration of phenytoin along with valproic acid protein binding of valproic acid is reduced and total steady state concentration.

2. Alteration in hepatic metabolism:

(A)Induction of metabolism

One drug enhances the metabolism of other drug usually by stimulating the production of the hepatic enzyme involved in drug metabolism. Due to enzyme induction may cause rapid metabolism of drug resulted to decrease in pharmacological action of a subsequent drug.Ex. When phenobarbital administered with warfarin there is increase in the metabolism of warfarin resulting in reduced anticoagulant.

(B)Inhibition of metabolism:

A drug that inhabits the microsomal enzyme production may raise the blood level of drug resulted to increase drug effect and longer duration of action .

Ex. When cimetidine administered with theophylline cimetidine increases the plasmaconcentration of theophylline results in increased in adverse effect.

3. Alteration in renal clearance of dioxin:

A)Increased in renal blood flow:

Drug which increases the rate of clearance increases the excretion of another drug.

Ex. When hydralazine administered with dioxin, there is increase the renal clearance of dioxin.

B) Decreased renal blood flow:

Drug which decreases the rate of renal clearance decreases the excretion of other drug results in risk of toxic effects.

Ex. When NSAIDS Administered with lithium ,NSAIDS decrease clearance of lithium results in increased in risk of toxicity.

C) Inhibition of active tubular secretion:

When penicillin/Nalidixic acid/methotrexate/Dispone administered with preboned, probenecid prolonged the half-life of penicillin and other drugs by increasing the plasma concentration thus allowing single dose therapy for preventing toxic reaction.

D) Alteration in tubular reabsorption affected the renal clearance process.

Ex. When antacids administered with aspirin there is reduction in the reabsorption of salicylate from tubules through increased in PH urine.

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Drug Distribution

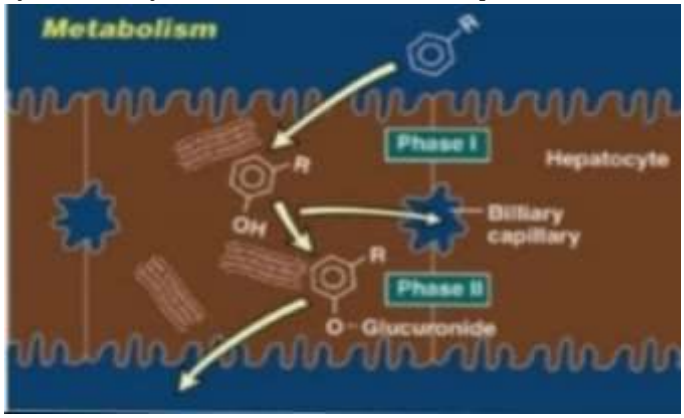
Drugs are delivered to a location for use or disposal. Serum proteins-bound. Basic medicines are bound to a-acid Glycoprotein, while acidic drugs are linked to plasma albumin [14]. The medication is pharmacologically inert while attached to a plasma protein because it cannot be filtered by the kidney and does not affect the concentration gradient. the medication is pharmacologically active when it is unbound or "free. The pharmacokinetics of bound medicines may be affected if albumin levels in the serum are reduced. A drug with a high affinity for binding may displace a molecule with a lower affinity, raising the free concentration of the drug with the lower affinity. However, the unbound portion of the drug is more readily available for both removal and the site of action. Using this rule has frequently been applied to medications with a narrow therapeutic index (490%) and high protein binding (490%) levels, where modest changes in free drug concentration could have a big impact on pharmacological effects.

Generally speaking, protein-binding displacement interactions do not result in clinically significant modifications of drug response [15,16] with the exception of situations where the displacing medication may also lessen the substrate drug's rate of elimination.Interactions between methotrexate and non-steroidal anti-inflammatory medicines (NSAIDs) are a good illustration of this idea. Different NSAIDs have an impact on the pharmacokinetics of methotrexate. Ibuprofen, for instance, may reduce the clearance of methotrexate by 40–50% [17], perhaps by lowering renal perfusion as a result of a reduction in renal prostaglandin synthesis (18).

Break Down Of Medication

Research in the field of biotransformation, sometimes referred to as metabolism, is expanding. Recent research suggests that metabolic pathways are involved in the majority of clinically significant medication interactions. The majority of medications leave the body via being chemically changed into a less lipid-soluble substance, at least in part. They are expelled by the kidney or in bile and are not reabsorbed across a lipid membrane. The majority of metabolism happens in the smooth endoplasmic reticulum of the hepatocyte, while it also takes place in the plasma, intestines, lungs, and skin.

Briefly, there are two phases to metabolism. The oxidation, hydrolysis, or reduction of a medication are all part of phase I metabolism. These processes make the drugs more water soluble and make it easier for the body to get rid of them. Stage Il Metabolism necessitates the joining of an additional adding a chemical to the medication to produce an inactive chemical and a medication that is more water soluble. Stage II Glutathione conjugation, sulfation, acetylation, and methylation are among the processes. The hepatic CYP is the enzyme responsible for this reaction's catalysis. Iron, heme, and a protein complex make up CYP. NADPH and molecular oxygen are used.Using (a reduced version of NADP) as an electron source, this a number of oxidations are catalyzed by the cytochrome system.Oxidised medication is produced as a result of reduction processes. the item



[19]. Even

Phase 1 and 2 metabolism

if there are over 50 differentJust three families of enzymes have been found. the CYP1, CYP2, and CYP3 enzymes are in charge of the most substances, including steroid metabolism, prostaglandins, vitamins, other Drugs form endogenous substances, and numerous medications.

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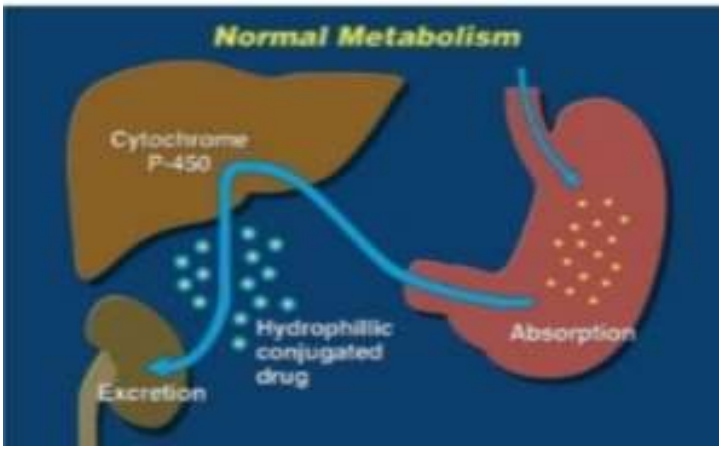


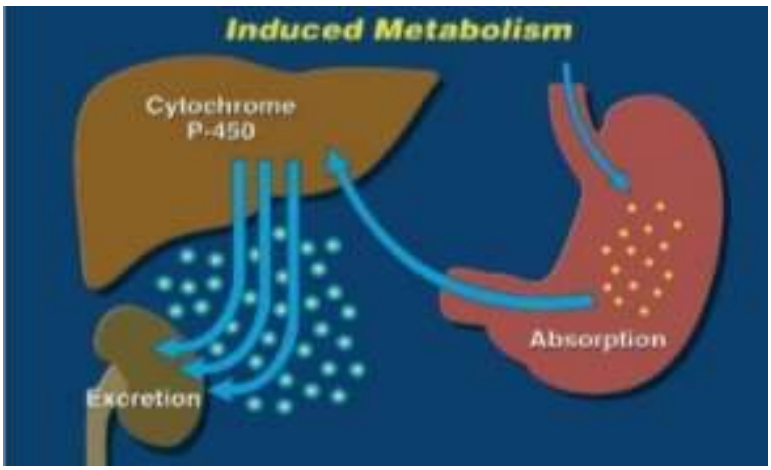
Normal metabolism

Used in dentistry: Depending on whether an enzyme is induced or inhibited, the rate of drug metabolism may be increased or decreased. Following prolonged exposure to an inducing substance, enhanced gene transcription typically results in the induction of drug metabolism As a result, the effects of enzyme induction might not manifest completely right away. An accelerated rate of metabolism, improved oral first-pass metabolism, and a decreased bioavailability are the results of enzyme induction. As a result of everything, the drug's plasma concentration falls. Contrarily, medications that are digested into an active or harmful Increased impact or increased toxicity may be linked to metabolite induction. An established and well-known case of enzyme induction involves the use of oral contraceptives with the medication rifampin (OCs). A powerful metabolic inducer of CYP, rifampin is an antibiotic used to treat tuberculosis. Due to the OC's altered metabolism, contraception may fail [20]. The barbiturates, phenytoin, and carbamazepine are further common CYP inducers. Drug-metabolizing inhibition results in a decrease in the drug's metabolite and an increase in the plasma concentration of the parent drug, which has a more pronounced, lasting pharmacological impacts.

Drug Excretion

Kidney is the main organ involved in removing substances from the body, just as the liver is the main organ involved in drug metabolism. The liver, lungs, digestive tract, saliva, sweat, tears, and breast milk are additional locations where drugs can be excreted. Changes in urine pH, which can affect a drug's passive reabsorption, competition for the same transport route, variations in active tubular secretion, or changes in renal blood flow are just a few of the mechanisms that might cause changes in renal excretion. The rate of urinary excretion of weak bases increases as a result of acidification of the urine.

Induced metabolism



Pharmacodynamics Interaction

A)Combinations of drugs are frequently used as therapeutic advantages because of their additive or synergistic beneficial effects. These combinations are categorized as either beneficial or harmful interactions based on their effects. a drug with comparable or connected biological effects synergistic effects are produced by drugs that operate at the same place or that affect the same

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physiological system. due to the usage of drugs with identical pharmacological effects, there are excessive pharmacological effects. drug with adverse pharmacological effects.

(B)The usage of two medications with pharmacologically distinct effects results in the interaction. These results are a result of a certain drug's side effects. For instance, an anti-diuretic drug.

C) Interaction at receptor site: When drugs are administered, they bind to specific regions of the receptor site and produce the effects that are observed. These interactions can occur at the same receptors or at different receptors that are located at physiologically related sites. both the opioid morphine and the medicine naltrexone work on the same receptor location when administered, but naltrexone blocks some of the effects of morphine, namely respiratory desorption.

D) Electrolyte level changes:

When adding a drug to a therapy regimen and changing the electrolyte level, it's critical to monitor the results.For instance, thiazide diuretics can lead to severe potassium loss.

The origins of unintended medication interactions [21]

- Mistaken medication selection.
- Not accounting for renal function.
- Inadequate dose.
- The incorrect administration method.
- Incorrect medication administration.
- Transmission mistakes

Managing Drug Interactions

Avoiding Concomitant Therapy; Changing the Main Drug's Dose

- Altering the timing of two drug intakes.
- Observation of combined therapies when employed.
- It's crucial to inform the patient about possible interactions.
- To find interactions, advanced screening procedures must be applied.[22]

TYPES OF INTERACTIONS

Drug interactions can take many different forms, so be cautious. Let's investigate each of them in more detail.

- **Drug-drug**

When two or more prescription drugs interact, it is known as a drug-drug response. One illustration is the interaction between fluconazole (Dipluran), an antifungal drug, and warfarin (Coumadin), an anticoagulant (blood thinner). Combining these two medications can increase bleeding to potentially severe levels.

- **Non-prescription medication:**

Treatment this is an interaction between a drug and one or more over-the-counter medications. These include herbal remedies, vitamins, supplements, and over-the-counter (OTC) drugs. Ibuprofen and a diuretic, a medication used to help the body get rid of excess water and salt, can interact in this way (Advil). Because ibuprofen frequently causes the body to retain salt and fluid, it may lessen the effectiveness of the diuretic. Both prescription and over-the-counter diuretics are available.

- **Drug food introduction:**

This occurs when consuming food or beverages changes how a medicine behaves. For instance, there may be an interaction between different statins and grapefruit juice. You run the risk of overdosing and developing liver or kidney failure if you drink a lot of grapefruit juice while taking one of these statins. Rhabdomyolysis is a potential adverse reaction to the statin-grapefruit juice combo. A protein known as myoglobin is released into the blood as skeletal muscle degrades. Myoglobin may potentially harm the kidneys.

- **Drug-alcohol:**

Some medicines should not be taken with alcohol, according to a reliable source. Combining these substances with alcohol frequently results in fatigue and slower reflexes. Additionally, it may raise your risk of unpleasant side effects. For instance, taking metronidazole and drinking alcohol at the same time can result in stomach pain, vomiting, and Trusted Source flushing. Antibiotic metronidazole is widely used.

- **Drug-disease interaction:**

This occurs when the usage of a drug changes or exacerbates an ailment or disease. Additionally, various medical conditions can raise the possibility of adverse medication reactions. For illustration, several decongestants that individuals use to treat colds might raise bloodHigh blood pressure sufferers should avoid using these products (hypertension). metformin, a medication used to treat diabetes, and renal problems are another example. Those who metformin dosages should be reduced or avoided in people with renal disease. ThisIs as a result of metformin's ability to build up in the kidneys of those who have this condition, the likelihood of serious adverse effects increasing.

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- **Drug-laboratory:**

Some drugs can affect the results of certain lab tests. Test findings may be inaccurate as a result of this. Tricyclic antidepressants, for instance, have been demonstrated toInterfere with skin prick tests needed to identify some diseasesallergies

DRUG INTERACTIONS EXAMPLES

1. Fluconazole with Simvastatin

Some CYP450 enzymes are prevented from operating normally by the fluconazole (Dipluran) medication. due to this modification, interactions with fluconazole are frequent. Fluconazole is one instance. simvastatin (Zocor), a cholesterol-lowering drug, induces an increase in blood levels of the drug. Because of simvastatin side effects more probable.

2. Dofetilide and Ondansetron

Zofran, a medication that contains ondansetron, is used to treat nausea and vomiting. However, it has a variety of possible interactions. The heart's beat is one illustration. dofetilide medicine (Tikosyn). Both drugs have the potential to prolong the period of time among heartbeats. This time can become excessive when used collectively. This could lead to fainting, dizziness, and in severe cases, even death. This conversation typically involves more severe when ondansetron is administered intravenously.

3.Digoxin (Lanoxin) and amiodarone

Digoxin is a heart medication. It is regarded as a limited therapeutic medicine for an index (NTI). This implies that even a small variation in its dosage could result in major issues Digoxin may be susceptible to medication interactions as a result.another heart drug called amiodarone (Pacerone) may interact with how much digoxin is absorbed into the circulation. This may result in effects that require more digoxin than usual.

4.WarfarinandBactrim

Some antibiotics, like Bactrim (sulfamethoxazole/trimethoprim), can make bleeding more likely. Interactions with blood thinners like warfarin may result from this.(Jantoven, Coumadin). when coupled with Bactrim, there is an increased risk of severe bleeding.

5.Omeprazole and levothyroxine

Levothyroxine (Synthroid), a medication for the thyroid, is another example of an NTI drug. Consequently, you must be cautious of any drugs that can have an impact on howit operates. Omeprazole (Prilosec) treats heartburn by reducing stomach acid production. heartburn. however, it may decrease levothyroxine's absorption, which would reduce its effectiveness.

6.Quinolones with Theophylline

Patients with asthma and other respiratory diseases often find relief using theophylline. nowadays, less people utilize it because there are better alternatives available. medications. antibiotics called quinolones are used to treat urinary tract infections.(UTIs) and other infections. Ciprofloxacin and ofloxacin are a few examples. sparfloxacin as well as norfloxacin.Quinolones interfere with theophylline's metabolism, which raises the drug's blood levels and raises the risk of the drug's toxicity as well as seizures.

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7. Sulfa drugs and warfarin

Warfarin: It's an oral anticoagulant that's used to stop blood clots from forming.Antibiotics with the sulfa class: These drugs are used to treat bacterial infections. I examplesInclude sulfisoxazole and sulfamethoxazoleSulfa medications and warfarin interact enhancing the effects of the former.

8. Phenytoin and Warfarin

Warfarin: It's an oral anticoagulant that's used to stop blood clots from forming. phenytoin: used to treat seizures and as an anti-convulsant. Warfarin's effects may be intensified by phenytoin, and vice versa. can raise phenytoin levels in the blood.

9. Macrolides and Warfarin

To stop blood clots from forming, people take warfarin, an oral anticoagulant. antibiotics called macrolides are commonly used to treat bacterial infections. examples azithromycin, clarithromycin, and erythromycin are some examples. warfarin's metabolism and clearance are reduced by macrolides, which has the effectOfthe effects of warfarin, such as bleeding, are increased.

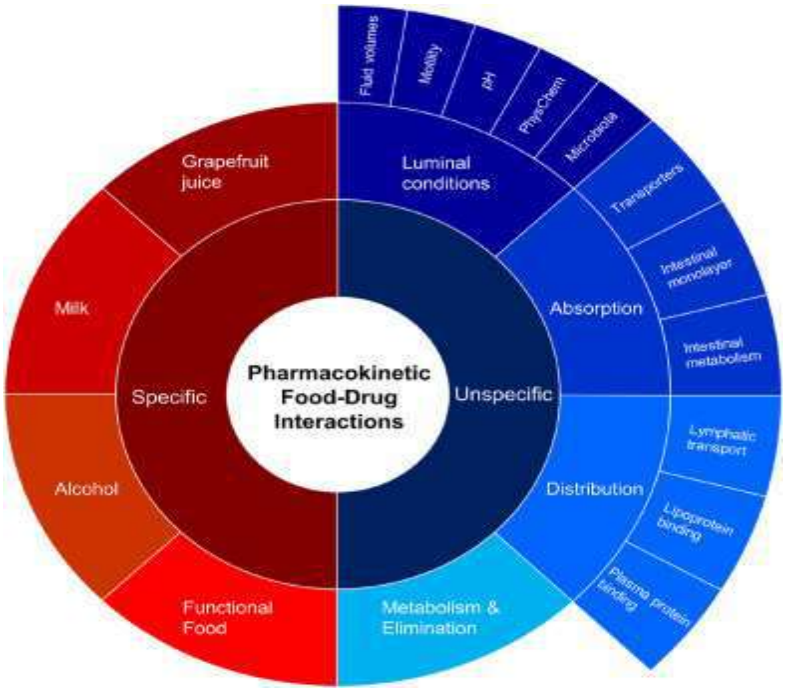
10. Verapamil and digoxin

Digoxin: When there is a disturbance in cardiac rhythm, it is used to treat congestive
heart failure and to reduce the heart rate. high blood pressure is treated with verapamil. the heart rate is slowed by it. verapamil may reduce the clearance of digoxin, resulting in higher levels. and possible toxicity of digoxin in the body. Digoxin with verapamil consumption may cause the heart to beat more slowly than necessary.

MECHANISM OF ACTION OF DRUG-FOOD INTERACTION

1.Interaction involving Absorption:

Due to changes in gastric pH and gastric acid production, many commonly used drugs may not be absorbed as well when food is



present in the stomach. motility, secretion, and of course GITtransit time. As an illustration, azithromycin taking it with food reduces absorption, which has a considerablenegative impact on the body's metabolic rate. a decrease in bioavailability of the food's nutrients, including calcium. the medicine and the anison may combine to generate complexes that are less readily absorbed. On the on the other hand, meals may improve the bioavailability of several medications (Fehr, 1998).

PHARMACOKINETIC INTERACTION

1.Interaction involving Absorption

Presence of food in the stomach may affect the absorption of many commonly used drugs, due to alteration of gastric pH, gastricsecretion, and motility and of course transit time of the GIT. For instance, azithromycin absorption is Decreased when it is taken with food, resulting in significant reduction in bioavailability. [**23**], the components of the food, such as calciumorison, may form complexes with the drug that are less easily absorbed. On the other hand, the bioavailability of some drugs may be enhanced by food (Fehr, 1998).

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2.Interactions With regard to distributions

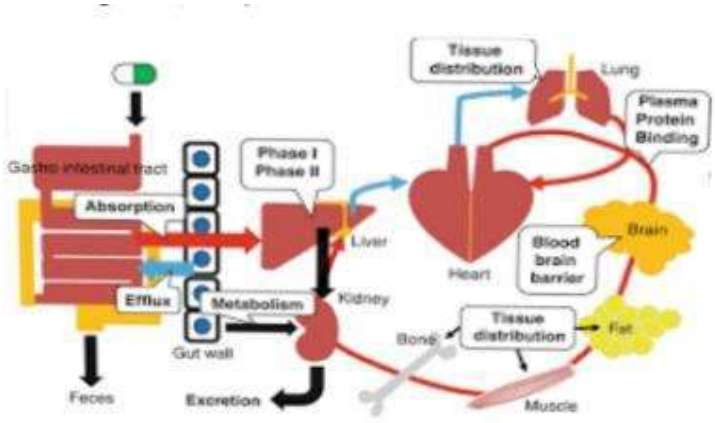
The blood or plasma concentrations of a medicine once it is in the systemic circulation depend on how widely it is transported to extravascular locations. The amount of drugs in the overall drug concentrations in the blood are represented by whole blood. the amount of drug molecules in the plasma is unaffected by their sequestration in red or white blood cells. Red blood cells. In general, unless the drug is preferentially sequestered by red blood cells, the quantities in the blood and plasma are believed to be equal. Whether a medicine can passively spread across tissue or organs will depend on the flow of blood through those areas. the amount to which cell membranes serve as a substrate for active uptake or efflux transporters binding to tissue and plasma protein sites.

3.Interaction involving Metabolism

Many drugs undergo hepatic metabolism, which can occasionally interact with food. For instance, when provided along with the hypertension medications felodipine and nifedipine, concentrated grape fruit juice increases the bioavailability of both. It is hypothesized that flavonoid components in grapefruit juice concentrate prevent felodipine nifedipine from being metabolised by cytochrome P-450. This interaction might make a substance more hazardous and effective.nifedipine felodipine. This interaction might make these medications more harmful and effective at the same time. Citrus fruit or its juice is frequently used in morning foods, therefore it has enormous clinical significance. Patients need to be made aware of this potential interaction (Fehr, 1998).

4.Excretion-related interactions

A number of food ingredients may change the pH of urine, which ultimately results in a decrease or increase in the patient's drug intake. Due to diets like these, acidic urine will have a longer half-life of acidic medications. meats, fish, cheese, and eggs), as long as the medication is still in its unionised form in an acidic medium. form and half-life of an acidic medication in an alkaline environment.



DIAGRAMMATIC SUMMARY OF DRUG -FOOD INTERACTION (ABSORPTION DISTRIBUTION, METABOLISM, EXCRETION).

Pharmacodynamic Interactions

Foods and medicines may change the pharmacologic effects of each other. Vitamin K-rich diets may impair the therapeutic efficacy of warfarin and produce antagonism. of the clotting agent. Among the foods high in vitamin K are green leafy vegetables.(Brussels sprouts, broccoli, spinach, kale, and turnip greens), cauliflower, chickpeas, liver, liver, and green tea.

Alcohol may enhance the effects of medications that slow the central nervous system, such as benzodiazepines, antihistamines, and Modes: o Narcotics, muscle relaxants, antipsychotics, antidepressants, or any medication with sedative properties (Booth, et al 1997). Coffee is an illustration of a meal that can enhance the effects of a drug because caffeine interacts with theophylline in a variety of ways. Caffeine has reportedly enhanced theophylline levels in the blood. Levels by 20% to 30% and lengthened theophylline's half-life by reducing clearance. Patients may express anxiety, trembling, or sleeplessness.

Caffeine has some bronchodilator effects, which may enhance.drugs with sedative effects include opioids, muscle relaxants, antidepressants, antipsychotics, and antipsychotics (Booth, et al 1997). Coffee is an illustration of a meal that can enhance the effects of a drug because caffeine interacts with theophylline in a variety of ways. There have been reported that caffeine boosted theophylline levels in the blood by 20%–30%. and decreased elimination, which lengthened theophylline's half-life. Patients mightcomplain of trembling, anxiety, or insomnia. There are some bronchodilator effects of caffeine. Which could improve.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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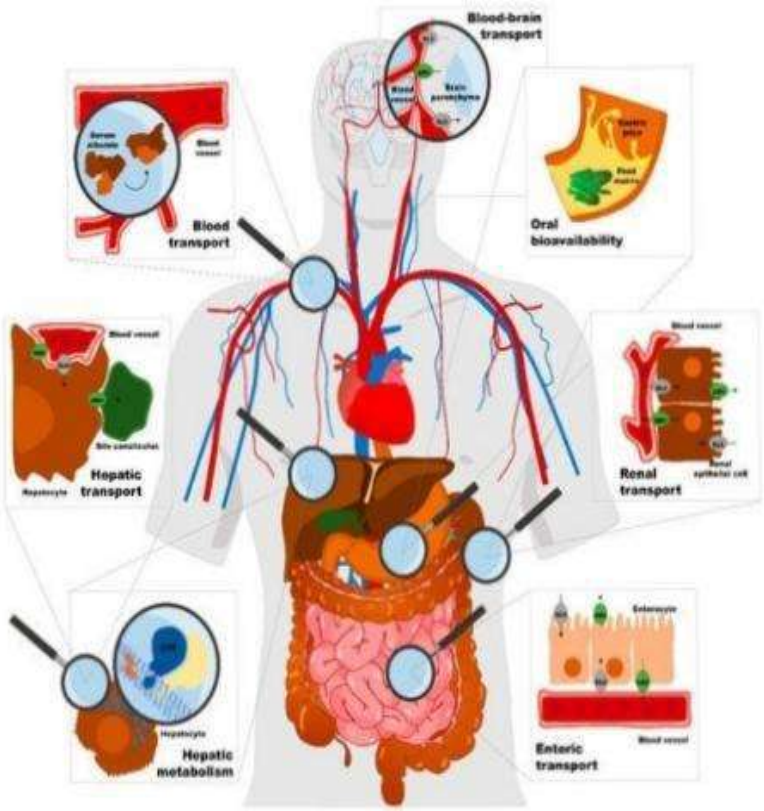

DIAGRAM DRUG-FOOD PHARMACODYNAMICS INTERACTION

EXAMPLES OF HOW FOOD AND DRUGS INTERACT.

1.Grapefruit and Atorvastatin

A cholesterol-lowering drug called atorvastatin (Lipitor) is broken down and eliminated from the by certain CYP450 enzymes in your body. Oranges and orange juice can prevent these the same CYP450 enzymes, which can increase your body's atorvastatin levels. This can make side effects more likely.

2.Leafy greens and warfarin

Warfarin functions by obstructing vitamin K's effects. Blood clots are influenced by vitamin K is abundant in leafy green vegetables, which can partially reverse the effects of warfarin. Finding a balance between the two is crucial. You must be constant in your approach. you consume a lot of leafy greens while taking warfarin.

3. Dairy and minocycline

Dairy products like milk and yoghurt can interact with certain antibiotics, including minocycline (Minocin). The amount of minocycline that is absorbed by your body can be decreased by dairy items. Minocycline should be taken either one hour before or two hours after consuming dairy products.

4.Alcohol and metformin

Alcohol and the diabetes drug metformin both increase the level of lactic acid in your blood.

Lactic acidosis is an uncommon but serious condition that can result from this. every now and then, having one or two drinks should be OK. But it's advisable to refrain from drinking.

5.Age-related meats and MAOIs

You can prevent your body from breaking down a protein called tyramine by taking a monoamine oxidase inhibitor (MAOI), such as selegiline (Emsam) or phenelzine (Nardil). aged meats, including tyramine levels are high in foods like salami and sausage. A body with too much tyramine can blood pressure to spike suddenly, which can be harmful. To keep away from this if you're taking an MAOI, you should consume a low-tyramine diet.

CONCLUSION

Elderly patients' prescriptions had more than five possible drug-drug interactions on average. By employing substitute drugs or congeners that are not linked to drug interactions, it would be simple to prevent the small percentage of drug interactions that belonged to risk category X (i.e., to be avoided drug combination). The two factors that were found to be predictive of probable drug interactions were increasing age and polypharmacy.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

EFFECT OF CORE STRENGTH TRAINING ON SELECTED PHYSICAL VARIABLES OF HANDBALL PLAYERS

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ABSRACT
The study was designed to investigate the effect of core strength training on selected physical variables of inter-school boy's handball players. To investigate the study, thirty inter-school boys handball players were randomly selected from NS handball academy Coimbatore and their age were ranged between 14 and 17 years. The subjects were randomly assigned to two equal groups (n=15). All the subjects were divided in to two groups with 15 subjects each as experimental and control group. Group-I underwent core strength training for a period of twelve weeks and group-II acted as control who did not participate in any special training other than the regular routine. The physical fitnessvariables such as shoulder strength and leg explosive power were selected as dependent variables. Pre and post-test random group design was used for this study. The dependent't'test was applied to determine the difference between the means of two groups. To find out whether there was any significant difference between the experimental and control groups. To test the level of significant of difference between the means 0.05level of confidence was fixed. The result of the study shows that, there was a significant changes takes place on shoulder strength and leg explosive power of inter-school boys handball playersdue to the effect of twelve weeks of core strength training. And also concluded that, there was a significant difference exists between experimental and control groups in shoulder strength and leg explosive power. The control group did not significant changes the selected criterion variables.
KEYWORDS: *Core strength training, shoulder strength, leg explosive power.*

INTRODUCTION

Core strength training mainly includes balance exercises that are performed regularly can improve core stability. Stabilize the spine is the primary function of the core muscles. The ultimate aim of core strength training is not to develop muscle hypertrophy but to promote functional capability of physical activity. This training leads to improve synchronization of participating muscles. "Importance of core muscle development can be underline in many functional and athletic activities as it enhances core stability and proximal stability to facilitate distal mobility. The appropriate timing and tension of core muscles contracting in sequence may enhance the optimal stability of both deeper and superficial core muscles" **McGill (2006)**. The core is a group of muscles that are not only essential for sports but also for our daily activities. It is important to strengthen our core because it involves in every movement of our body. It allows other musculature to produce force and also regulate the transfer of energy. It helps the practitioners to enhance the fitness level which increase their working performance. Even elderly people can also practice to maintain their fit and flexible "Core strength is essential for improvement of strength and the ability of the neuromuscular system to generate force, and stabilizes kinetic chain dynamically, the core musculature also helps to protect it from unwanted forces that are part of functional movements" **Richardson (2000).** A strengthened core region works as a solid block that prevent chest cavity from moving while perform strenuous lifting exercises. Core training improves our posture through strengthening of torso and abdominal muscles. Strong core muscles help us to sit straight because of the lower abdominal muscles has drawn in toward the spine. The increased core stability helps us to keep our spine healthy and flexible all over the life. Core training promotes the strength, stability and mobility of our core muscles and helps our body to perform the movements more efficiently.

Core strength is an essential part of any athlete's total fitness. Handball athletes cannot ignore this facet in their physical training because handball is not a one dimensional game; players are constantly shifting their body from side to side or rotating **(Akuthota et al., 2008)** their bodies toward the ball. One strategic level of handball requires that one keeps their opponents running and off-balance, hence many directional changes during a match. Therefore, this study aimed to analyse the motor fitness parameters in male handball players after 12 weeks of the core training programme. It was expected that a scientific core muscle

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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training method for male handball players could be proposed. (**Leetun, 2004)**

METHODOLOGY

The purpose of the study was to find out the effect of core strength training on selected physical variables of inter-school boys handball players. To achieve the purpose of the study, thirty inter-school boys handball players were from NS academy, Coimbatore. The subjects were randomly assigned in to two equal groups namely, strength training group (STG) (n=15) and Control group (CG) (n=15). A pilot study was conducted to assess the initial capacity of the subjects in order to fix the load. The respective training was given to the experimental group the 3 days per weeks (alternate days) for the training period of twelve weeks. The control group was not given any sort of training except their routine.

Design

To evaluate physical fitness variable shoulder strength in push up measured in score. The parameters were measured at baseline and after twelve weeks of strength training were examined. To evaluate physical fitness variable leg explosive power in jump test measured in score. The parameters were measured at baseline and after twelve weeks of strength training were examined.

Training protocol

The training programme was conducted for 45 minutes for session in a day, 3 days in a week for a period of twelveweeks duration. These 45 minutes included 10 minutes warm up, Plyometric training for 25 minutes and 10 minutes warm down. Every three weeks of training 5% of intensity of load was increased from 65% to 80% of work load. The volume of strength prescribed based on the number of sets and repetitions. The equivalent in strength training is the length of the time each action in total 3 day per weeks (Monday, Wednesday and Friday).

Table I
Computation of 'T' Ratio on experimental group and Control group selected physical variables of inter-school boy's handball players.

Group	Variables		Mean	N	Std. Deviation	Std. Error Mean	t ratio
Experimental Group	Shoulder Strength	Pre	19.26	15	0.88	0.35	6.32*
		Post	21.53	15	1.30		
	Leg Explosive power	Pre	1.51	15	0.166	0.008	4.40*
		Post	1.55	15	0.164		
Control Group	Shoulder Strength	Pre	18.93	15	1.90	0.34	0.96
		Post	18.60	15	2.35		
	Leg Explosive power	Pre	1.51	15	0.04	0.09	1.37
		Post	1.52	15	0.04		

*Significant level 0.05 level degree of freedom (2.14, 1 and 14)

Table I reveals the computation of mean, standard deviation and 't' ratio on selected skill performance variables namely shoulder strength and leg explosive power of experimental group. The obtained't' ratio on forehand drive and leg explosive power were 6.48 and 4.40 respectively. The required table value was 2.14 for the degrees of freedom 1and 14 at the 0.05 level of significance. Since the obtained't' values were greater than the table value it was found to be statistically significant. further the computation of mean, standard deviation and 't' ratio on selected physical variables namely shoulder strength and leg explosive power of control group. The obtained't'ratio on shoulder strength and leg explosive power were 0.96 and 1.37 respectively. The required table value was 2.14 for the degrees of freedom 1and 14 at the 0.05 level of significance. since the obtained't' values were lesser than the table value it was found to be statistically not significant.

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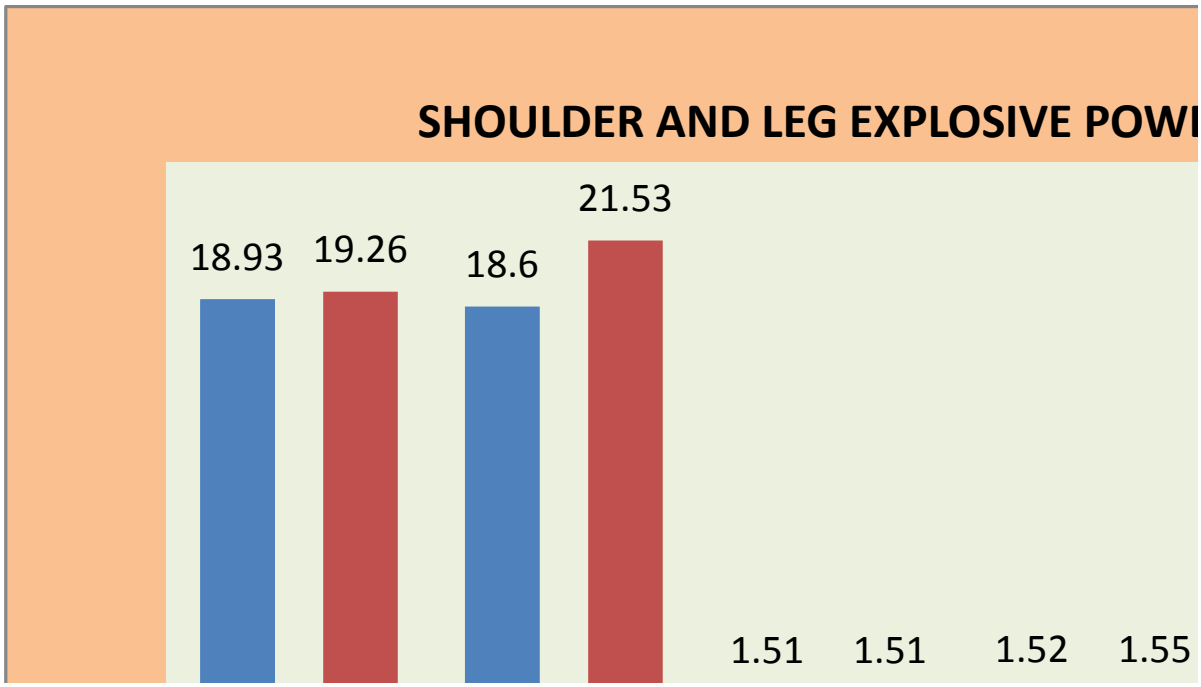
The bar diagram shows the mean values of pre test on leg explosive power of control group and experimental group.



DISCUSSION ON FINDINGS

The present study was experimented the effect of core strength training on shoulder strength and leg explosive powerof inter-school boys handball players. The result of this study indicated that the core strength training improved the shoulder strength and leg explosive power. The findings of the present study had similarity with the findings of investigations referred in this study. **Seied** (2012) evaluate the effect of Strength and Core Stabilization Training on Physical Fitness Factors among Elderly People. **Sekendiz** et al., (2012) examined swiss- ball core strength training on strength, endurance, shoulder strength, and balance in sedentary women. **Subramanian** *al.,* (2014) reported that core strength training induced adaptations on selected physical and physiological parameters of cricket players. The result of the present study indicates that the core strength training programme is effective method to improve muscular strength and shoulder strength of inter- school boys handball players. The discrepancy between the result and the result of previous studies might be attributed to several reasons, such as the training experience level of the subjects, the training program, the intensity used and the duration of the training program.is speculated that the observed changes in short service may properly designed sport specific which are suitable for adolescent male badminton players.

CONCLUSION

Based on the results of the study following conclusion have been arrived.

1. Eight weeks of core strength training program significantly improved the shoulder strength and leg explosive power of inter-school boys handball players.
2. The core strength training is appropriate training protocol to bring out desirable changes over fitness variables of handball players

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EPRA International Journal of Research and Development (IJRD)
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AN ANALYSIS OF EMERGING TRENDS IN ONLINE SHOPPING DURING AND POST COVID-19 WITH SPECIAL REFERENCE TO THE CONSUMERS OF MANGALURU CITY: A PERSPECTIVE STUDY

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Article DOI: https://doi.org/10.36713/epra12246
DOI No: 10.36713/epra12246

ABSTRACT

COVID-19\ Novel Corona virus *disease has changed the normality of the world as it had earlier. The rapid dissemination of the contagious viral infection among the social community has shaken the basic composition of working operations in numerous business sectors. Online Shopping\ E-shopping is an emerging trend in the field of* ***E-Commerce*** *over the recent years. The purchasing of goods electronically has helped the customers to fulfill their needs of procurement with more convenience and discomforts. After the outburst of the pandemic, the purchase of products via online has assumed greater attention and significance in view of controlling the spread of virus in traditional buying at the physical stores\shops. The proportion of placing E-orders for the commodities has increased immensely in the post epidemic scenario. The customers tend to buy more items digitally rather than resorting to in-personal shopping in the actual shops as a precautionary measure. In this regard, an attempt has been made to analyse* ***the emerging trends in e-shopping during and Post COVID-19 era*** *by collecting the primary data from the selected consumers (respondents) living in* ***Mangaluru City.***

KEYWORDS: *COVID-19, Consumers, Emerging Trends, E-Purchases, Online Shopping, Post pandemic,*

INTRODUCTION

An extensive growth of **Corona pandemic** all across the parts of the country, insistence of **country-wide lockdown** and the maintenance of **social distancing** by the public in public places mandatorily have interrupted the usual habits and preferences of the customers and their method of shopping. The outbreak of vicious virus in the society has led to the adaption of new habits to suit the requirements of current situation. The emergence of new habits among the consumers is due to **COVID-19** and the advancement of **technology** in the sphere of business and commerce. After the outburst of pandemic, the numerous changes have been recognised with regard to the likes, dislikes and priority of the consumers. The post corona period has revolutionised the field of E-commerce in terms of expansion in online purchasing activities.

E-shopping plays a key role in providing safety to the people from infection by enabling them to procure various commodities from their convenience place itself without visiting the stores\shops. Online purchasing is the system of buying products\ services electronically by using digital devices without in-human contact with the seller\store keeper. The E-ordering of the goods has become the most recent trend in the era of **COVID-19** as a precautionary and preventive measure to safeguard the wellbeing of the customers. In view of combating the wide transmission of the infection, the consumers have changed and shifted their behaviour as regards the purchasing decisions and restricted them to stay back at their safest places except for the acquisition of essentials and the emergency reasons. As a result the demand and necessity for commodities through internet purchases has increased radically on the part of the consumer groups over the few months as a matter of mitigating the risk from the microbe contamination. This manuscript is specifically prepared to examine the **recent trends in E-shopping among the consumers during and after the age of COVID-19.**

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OBJECTIVES

- To study and understand the emerging trends in respect of online purchasing behaviour of the consumers during and after the Covid-19 outbreak.
- To specify and analyse the factor determinants influencing the consumers to shift from conventional buying to electronic shopping after the Corona eruption.

RESEARCH METHODOLOGY

Area of the study: For the purpose of collection of primary data, the area of the study has been confined to the limit of **Mangaluru City Corporation (MCC), Dakshina Kannada district.** The respondents (consumers) were chosen randomly on convenience basis living in different areas of the city.

Sample size: The size of the sample taken into consideration for undertaking the study would be **20 respondents**. The respondents are interviewed and interacted face to face by ensuring **social distancing.** Besides this, responses have been gathered through **telephonic method** and the secondary data was extracted from several articles and related websites available in the internet.

Limitations of the study: The sample size determined for the survey was limited to the few consumers of **Mangaluru City** and hence the inferences of the study wouldn't be applicable to other regions of the country.

ANALYSIS OF EMERGING TRENDS IN CONSUMER BEHAVIOUR TOWARDS ONLINE SHOPPING

The existing adverse crisis created by the pandemic has changed the normal behaviour of human beings leading to the disruptions in their respective work and in the area of business. The **National lockdown** enforced in the country has forced the people to work from home except for the purchase of necessary items. The research study clearly indicates that, majority of the respondents (consumers) of **Mangaluru City Corporation** would like to step out from their house only to obtain the basic commodities like **groceries, vegetables, fruits and meat etc**. The on-shop buying of the goods has been restricted only to the basic needs as the consumers are likely to be worried about the risk of getting infected from the microbe (virus) in public places.

The demand for non-essentials has drastically decreased in the physical stores and malls where the individuals face the challenge of keeping physical distance from others. Most of the respondents would like to use online platforms for acquiring different **comfort and luxury items**. As per their view, the chance of being affected by the virus is very low in case of electronic purchases rather than traditional buying. The key- factors which determine the online purchasing decision of the consumers would be digitalization and the protection from the risk.

The survey also shows the fact that, some part of the consumers who have never purchased the products through online mode during **Pre-COVID** have shown interest towards online shopping in **Post COVID-19** as a preventive measure to overcome from the evils of **Corona.** Over the last **2 months period,** the market share for the E-commerce and the buyer behaviour has altered beyond the expectations. Besides, some of the consumers also opined that getting the goods electronically has been adapted temporarily until the problem of **Novel corona** gets resolved and disappears from the society. They prefer to restart buying from the conventional market places as like before when the world would be freed from the clutches of cruel virus.

SUGGESTIONS TO THE COMPANIES AND CONSUMERS

- The companies need to provide additional benefits to the consumers by offering **special discounts and concessions** for the online purchase of goods.
- The companies should update the **security features** on their website in order to ensure safety especially to those who have security concerns.
- The companies have to modify the **return policy** of sold items in favour of the consumers to enable them to return the products in case of **damage\ low quality** etc.
- The consumers must be aware of **online fraudsters** and have to be cautious while placing the orders for the goods against such companies.
- The consumers need to be educated to make effective use of **electronic gadgets** for the purchase of products in case of necessity and the unnecessary expenses could be avoided.

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CONCLUSION

The era of post pandemic has been regarded as **'New Normal'** where people need to accept the truth of universal existence of the disease and the undesirable condition has to be treated as normal phenomenon until the global crisis and challenges of the epidemic would be resolved in the society. To conclude, the major shift in the consumer behaviour is due to fear and the reluctance to socialize in crowded places and the evolution of ICT in business. The **COVID-19** has created a **landmark** for the adaption of **E-Commerce** among the mass section of the customers. The outcomes of the study has clearly reveals the fact that the post **COVID-19** has made the consumers to rely upon heavily on online shopping to get rid of from the dreadful virus. Though digital purchasing of the products has certain limitations, people are likely to opt it owing to the adverse situation prevailing in the nation in order to protect them from all sorts of the risks generated by **Corona.**

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

HOMOGENEOUS SENTENCE MEMBERS IN RUSSIAN AND UZBEK

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ANNOTATION

This article deals with the study of homogeneous members of a sentence in modern Russian and Uzbek.

KEYWORDS: *intonation, semipredicativity, sentence, conjunctions, morphological expression, syntax.*

ОДНОРОДНЫЕ ЧЛЕНЫ ПРЕДЛОЖЕНИЯ В РУССКОМ И УЗБЕКСКОМ ЯЗЫКЕ

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Аннотация

В данной статье рассматриваются вопросы исследования однородных членов предложения в современном русском и узбекском языке.

Ключевые слова: *интонация, полупредикативность, предложение, союзы, морфологическое выражение, синтаксис.*

Несколько подлежащих при одном сказуемом, несколько сказуемое при одном подлежащем, несколько второстепенных членов, которые зависят от одного и того же слова и отвечают на один и тот же вопрос, называются однородными. (Волчишка вылез, осмотрелся, походил, сел. Ветер загудел, сорвал крышу с сарая).

Между однородными членами предложения ставятся запятые. Запятые ставятся, если однородные члены соединены союзами А, НО. (Солнце светит, но не греет. В гостях хорошо, а дома лучше).

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
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Запятые не ставятся, если однородные члены соединены одиночным союзом, И, ИЛИ. (В саду растут яблони и груши).

Запятая ставится, если однородные члены соединены повторяющимися союзами И, ИЛИ. (В саду растут и яблони, и груши. В лесу пахнет или перлыми листьями, или нагретой корой).

Однородные члены предложения произносятся с интонацией перечисления. Например:

Мама купила желтые, красные, зеленые шары. Я ехал не на автобусе, а в метро.

Мальчик кинул мяч, а он в сетку не попал.

Снежными коврами покрылись и деревья, и кусты, и дороги.

Целую неделю движется караван по пескам, а поесть и напиться негде.

Развитие речи студентов с использованием однородных членов предложения, чтении текстов по специальности.

Осложненные предложения включают:

1) предложения с однородными членами;
2) предложения с обособленными членами;
3) предложения с вводными и вставными конструкциями;
4) предложения с обращениями.

По традиции включая в осложненные предложения перечисленные конструкции сразу же отметим их пестроту и разнообразие, отсутствие единого основания выделения в отдельные группу и пестроту самих групп.

Если эти виды предложений рассмотреть по шкале переходности, то увидим, что они занимают зону переходности между простыми и сложными предложениями.

Центр осложненных предложений занимают предложения с обособленными членами; периферийными для сложного предложения являются предложения с вводными и вставными конструкциями и обращениями; периферийными для простого предложения являются предложения с однородными сказуемыми.

Место конструкций по шкале переходности определяется степенью предикативности той части предложения которую можно назвать осложняющей, т.к. оно содержит полупредикативность, дополняющую основное предикативное ядро и проявляющуюся в разной мере.

Таким образом, полупредикативность – это дополнительное и основному высказыванию сообщение об отнесенности высказываемого к действительности.

По «количеству» предикативности следующий ряд предложений неравнозначен:

1. На площади *стоят* неподвижные и величавые липы.
2. *Липы* на площади *стоят неподвижные и величавые.*
3. *Липы, неподвижные и величавые,* стоят на площади.
4. На площади *стоят липы. Они неподвижные и величавые.*

В первом и втором примерах одна предикативность, отличаются они разной степенью значимости признака: в составе именного сказуемого признак приобретает предикативный характер, что усиливает его коммуникативную значимость.

В третьем предложении «полторы» предикативности в четвертом – две. Наиболее экономным по языковым средствам и семантически емким оказываются, третий пример определениями, т.е. с частичным выявлением потенциальной предикативности, свойственной вообще определениям. Предикативная сущность определений наиболее наглядно выявляется при замене одного предложения двумя (4-й пример). Это позволяет в максимальной степени актуализировать признак.

Полупредикативность вносит тонкие оттенки и информативную семантику синонимичных конструкций.

В системе осложняющих полупредикативных групп степень полипредикативности может быть большей или меньшей. Даже внутри отдельных групп нет единообразия по основному признаку осложненных

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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предложений – в них можно (при более глубоком и более детализированном анализе) выявить разные по степени предикативности разновидности.

Однородные члены предложения – одно из проявлений структурно–семантической категории синтаксиса – однородности, которая обнаруживаются и не уровне сложного предложения.

Однородными могут быть все члены предложения: Мелькают мимо **будки, бабы, Мальчишки, лавки, фонари, Дворцы, сады, монастыри**… (Пушкин); гром **перекатывается, грохочет, ворчит, рокочет, встряхивает землю.** (Паустовский); Интимная поэзия Блока никого не может оттолкнуть от себя с первого взгляда, но для своего настоящего понимания требует **вдумчивости и внимания** (Брюсов); Я хочу изведать тайны жизни **мудрой и простой**. (Брюсов); Весна посылает песни **радостно, ясно, ново**. (Луканин).

Однородными могут быть компоненты членов предложения, чаще всего сказуемых: Счастье **не может, не должно быть одинаковым**. (Дубов); Создание языка **было и остается процессом познавательным**. (Брюсов); Язык **должен быть прост и изящен**. (Чехов).

Как показывают примеры, однородные члены предложения обычно имеют одинаковое морфологическое выражение однако могут быть выражены различными частями речи и разными формами какой-либо части речи. В ряд с однородными членами могут входить фразеологические сочетания, словосочетания и даже придаточные предложения (чаще с помощью упадательного слова); Говорил Жухрай ярко, четко, понятно, простым языком (Н.Островский); Говорил он спокойно, без грусти, без жалобы в голосе и так, точно он сам внимательно вслушивался в свою речь; проверяя ее мысленно (Горький).

Однородные члены предложения характеризуются набором следующих признаков:

1) занимают позицию одного члена предложения;
2) связаны с одним и тем же членом предложения подчинительной связью;
3) связаны между собой сочинительной связью;
4) часто имеют одинаковое морфологическое выражение;
5) обычно выражают однотипные понятия.

В основу определений однородных членов, кладется один (или два) из указанных признаков, поэтому, естественно, что эти определения не охватывают всех случаев однородности членов предложения.

Главным признаком однородные члены является то, что они занимают позицию одного члена предложения. Именно в этом свойстве однородных членов проявляются и сочетаются все остальные.

В предложении однородные члены объединяются в цельный структурно-семантический блок по отношению к другим членам предложения, синтаксическая функция всей группы однородные члены совпадает с синтаксической функций любого члена этой группы.

Таким образом, в связь с другими компонентами предложения однородные члены вступают не сами по себе, а лишь в структурно-семантическом единстве, в сочиненном ряду.

Структурно-семантический блок однородных членов связи с другими членами предложения подчинительной связью. Все однородные члены со исключением подлежащих, являются соподчиненными членами, так как подчиняются одному и тому же члену предложения. Так, в предложении Лес **зазвенел, застонал, затрещал** (Некрасов). Однородные сказуемые подчинены подлежащему лес, а между собой связаны сочинительной бессоюзной связью.

В предложении **Сказка нужна** не только детям, но и взрослым (Паустовский). Однородные дополнения подчинены сказуемому а между собой связаны союзом не только, но и однородные подлежащие подчиняют себе сказуемое (или сказуемые) и общие второстепенные члены, если они есть: Раскаленные **камни и песок обжигали** босые ноги (Конецкий). Не только юношеские **стихотворения** Блока, **но и его** позднейшие **создания требуют** от читателя большого напряжения внимания (Брюсов).

Выявив внешние связи сочиненного ряда, обратимся к анализу его внутренних, собственных свойств.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Структура блока однородных членов. В блоке однородных членов его части связаны между собой по смыслу и грамматическими средствами. Грамматические значения блока однородных членов выражаются интонацией (в устной речи), сочинительными союзами и некоторыми лексико-грамматическими средствами.

Интонационная перечисления наблюдается в предложениях без союзов и при соединительных союзах, а противительные, разделительная и сопоставительная интонация обычно сопровождают противительные, разделительные и сопоставительные союзы.

В соединении однородных членов особенно велика роль союзов. По традиции сочинительные союзы делятся на следующие группы:

а) соединительные: и, да (в значении и), ни-ни;

б) противительные: а, но, за (в значении но), зато, однако;

в) разделительные: или, либо, то-то, не та, не то;

г) сопоставительные (градационные): как-так и, не только- но и, хотя и – но, если не-то, не то чтобы –а (но), не столько – сколько;

д) присоединительные: да и, а и, но и, да и то, а и то и др.

Структурно-семантическая ценность блоков однородных членов в их связях между собой и с другими членами предложения может быть выражения не только союзами, но и другими лексико-грамматическими средствами: предлогами, частицами формой множеств. Число сочетающихся с блоком слов, наличием общего второстепенного члена, общим главным членом в словосочетании. Нередко в одном предложении встречается не один, а несколько способов связи.

Семантика блока однородных членов. Языковым значением блока однородных членов является однотипность понятий, выражаемых однородными членами. Это значение обусловливает позицию в предложении, единую для всего блока синтаксическую функцию. В однотипности членов предложения обнаруживаются разные степени лексико-семантических обобщений.

При внимании к лексико-семантическим значениям однородных членов можно заметить, что в сочиняемом ряду встречаются синонимы, сталкиваются антонимы, образуя дополнительные речевые смыслы, которые взрывают эхо внешнюю однотипность, одномерность и т.д. **Ликуя и скорбя, И обливаясь** черной кровью, Она глядит, глядит, глядит в тебя, **И с ненавистью и с любовью!** (Блок). Вагоны мимо, мимо, мимо… **И радостно**, **И грустно** мне.

При повторяющихся сочинительных союзах, которые приобретают свойства усилительных частиц, каждый следующий член однородного ряда приобретает большую смысловую значимость по сравнению с предыдущим.

Наиболее веселыми оказываются последний и первый члены ряда. Например: А ты, молодое вдохновение…Не дай **остыть** душе поэта, **Ожесточиться, очерстветь. И наконец окаменеть** (Пушкин). За все я отвечаю в этом мире – **За вздохи, слезы, где и потери. За веру, суеверы и безверье**.

Общее значение однотипности сочиненного ряда уточняется, видоизменяется, дифференцируется и т.д. разнообразными средствами связи, функциональное назначение которых состоит в выражений не только общего значения, но и многочисленных оттенков, дополняющих и осложняющих общее значение. Например:

1) Отношения градации, при которой, несмотря на формальное «равноправие», в семантическом плане актуализируется один или несколько однородных членов.

2) Разделительные отношения выражаются разделительными союзами – Что я? Царь или дитя? Либо дождик, либо снег, либо будет, либо нет. На белую блузку Анна Борисовна повязала не то бантик, не то галстук.

3) Противительные отношения выражаются в основном противительными союзами, однако здесь возможны и союзы других групп, в частичности соединительные и присоединительные: Хотел помочь – и не мы (Пушкин). Я давно собирался навестить тебя, да боялся потревожить.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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4) Причинно – следственные отношения чаше встречаются в блоке однородных сказуемых, однако они возможны и в блоке определить лексико-грамматическим средствам выражения этого оттенка значения являются местоименные наречия потому, поэтому, отчего, вводное слово следовательно и т.д.

5) В блоке однородных членов выражаются временные отношения (одновременность и последовательность) которые способны дополнять и осложнять отмеченные выше значения. Значения одновременности и последовательности могут быть актуализированы семантическими конкретизаторами – обстоятельствами времени: Можно **любить** и **ненавидеть** одновременно (Брюсов).

Каждые полминуты он медленно, как подмокшая спичка, **начинал разгораться**, потом **вспыхивал** лучистым белым огнем.

Описание семантики блока однородных членов предложения показывают:

1) общее языковое значение однотипности блоков лишь фон, на котором с помощью разнообразных средств связи выражаются разные значения, связанные с лексико-семантическими значениями словоформы:

2) в семантике блоков обнаруживаются такие оттенки, которые не позволяют в категорической форме говорить о смысловом равноправии однородных членов, хотя такие случаи нередки.

Таким образом, смысловое «равноправие» не может быть дифференциальным признаком однородных членов предложения, поэтому в целом для блоков однородных членов свободный порядок словоформ не характерен;

3) отмеченные значения наблюдаются и в сложно сочиненных предложениях, чем объясняется и общность средств связи, главными из которых являются сочинительные союзы;

4) в семантике блоков однородных членов есть и значения, характерные для подчинения (ср. также: отец и сын – отец с сыном) и др.

Обобщающие слова при однородных членах. Обобщающие слова являются самым общим выражением семантики однородных членов. Они занимают обычно актуализирующие позиции: или открываются сочиненный ряд, или закрывают его.

В роли обобщающих слов часто используются местоименные словоформы: все, всегда, везде, всюду, никуда и т.п.: **Все: лицо, походка, взгляд, голос** – все вдруг изменилось в ней. Нет ничего откладывать. Нельзя: ни праздник, ни воскресную прогулку. **Повсходу: в кустах, в траве** – затем, зачирикали птицы. **В вестибюле, в коридоре, в кабинетах – всюду** толпились люди. **Он был мастер на все руки: слесарь, столяр, плотник и даже механик**.

Особо выделим пример с обобщающей глагольной формой: Он заметно **молодился – подкрашивал усы,** носил вышитые рубашки. Росло во мне желание жить, водить большие траектория, любить, знакомится, дружить.

Нечеткость связи обобщающего слова, с однородными членами – причина разнородности знаков применения.

Однородные и неоднородные определения – их разграниченые – один из наиболее трудных вопросов. В грамматика литературе отмечаются лексические и грамматические (морфологические и синтаксические) критерии разграничения однородных и неоднородных определений.

Одним из главных факторов является семантика определении: однородные определения характеризуют разные предметы (или один предмет) по одному признаку (цвету, материалу, размеру и т.п.), а неоднородные определяют предметы (или предмет) с разных сторон. ср.: всюду между, деревьев мелками белые, красные, синие рубахи. – На нем белое новеньская **синяя сатиновая** рубашка и черные штаны.

В некоторых пособиях также однородные определения рассматриваются как синонимы, которые употребляются вместе, для того чтобы полнее характеризовать предмет. Также синонимы обычно не исключают друг-друга а, перекрываясь, описывают предмет более полно и объединяются единством производимого впечатления.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

Среди морфологических факторов наиболее существенно то, что в однородном ряду используются обычно только качественные или только относительные прилагательные: Над нами теперь торжественно шумели темно-зелеными вершинами красивые, стройные кадры. Если одно из определений качественное прилагательное а другое – относительное, то определение обычно неоднородны: Царственный дубовый лес подступал к самым окнам. То же самое при сочетании местоимений и прилагательных: Широка страна мая родная…

Среди синтаксических факторов отметим следующие:

1) Вопрос об однородности/неоднородности определений решается на основе характера связи слов в словосочетании: определения не являются однородными, если одно из них непосредственно связано с определенным словом, образуя с ним словосочетание, а другое относится ко всему этому словосочетанию как и одному сложному наименованию.

Общеизвестен пример сложного словосочетания длинный товарный поезд, в котором определение длинный относится к сочетанию товарный поезд: длинный товарный поезд.

2) Однородность/неоднородность определений может зависеть от их количества: чем определений больше, тем ярче интонация перечисления, отражающая желание говорящего перечислить признаки предмета, важные для его характеристики: Хороша развесистая, белоствольная, светло-зеленая, веселая береза.

Невозможно учесть при квалификации однородности/ неоднородности определений все указанные факторы, тем более что нередко они дополняют друг-друга: Мы проводили мрачную и грустную зиму в нашем старом покровском доме. Трудности в разграничении начинаются там, где область «чистой» грамматики соприкасается с областью лексических значений.

В разграничении однородных и неоднородных определений много субъектного. В лингвометодических целях из многих факторов, указанных выше, целесообразно выделить объективные показатели. К ним относятся семантическое различие по цвету, материалу и т.д. и морфологический фактор, учитывающий сочетаемость качественных и относительных прилагательных и др.

Как в русском, так и в узбекском языке однородными членами бывают два или несколько членов, которые относятся к одному члену и отвечают на один и тот же вопрос.

Однородные члены в общих языках обычно выражаются соответственно одними и теми и же частями речи, имеющими одну и ту же грамматическую форму, но они могут быть выражены и различными грамматическими формами, так как каждый член предложения может выражаться различными частями речи.

Однородными членами предложения в русском языке не могут иметь при себе пояснительные слова, - они могут быть распространенными.

В обоих языках все члены предложения могут быть однородными. В предложении они могут быть связаны посредством союзов и без союзов.

В русском языке определения могут быть однородными, если каждое из них связывается перечисляются разновидности признака предмета, например: Осенью ковыльные степи совершенно изменяются и получают свой особенный, самобытный, ни с чем не сходный вид.

В узбекском языке однородность определения находится в соответствии с русским языком.

В русском языке между однородными определениями можно вставить соединительный союз и, по-узбекски **ва, хамда**; однородные определения разделяются запятыми, а между неоднородными определениями нельзя поставить соединительный союз и, и они запятыми не разделяются.

Такое различие определений на письма имеется в обоих языках.

Союзы при однородных членах. При однородных членах предложениях бывают соединительные союзы: и, ни-ни, да (в значении и).

В узбекском языке в соответствии с русским языком, при однородных членах бывают союзы **ва** (и, за).

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

В русском языке при однородных членах могут быть разделительные союзы: или, либо, то-то, не то – не то. Им соответствуют в узбекском языке союзы: йа (ва,ёки, унда).

При однородных членах могут быть противительные союзы а, но, за (-но) и др. Им в узбекском языке соответствуют союзы **лекин, аммо, анча.**

Предлоги при однородных членах. В русском языке при однородных членах могут стоять предлоги если в предложении при каждом однородном числе стоит один и тот же предлог, то его можно сохранить только при первом однородном члене и опустить перед остальными.

В узбекском же языке предлогов нет, их заменяют послелоги (приложении) (**илова**) которые могут также опускаться при однородных членах, как и предлоги в русском языке; только в узбекском языке послелог сохраняется при последнем однородном члене.

В узбекском языке не только послелоги, но и аффиксы, прибавляемые к концу глагольных форм **лар,** даже аффиксы, прибавляемые к склоняемым частям речи в том или другом падеже, подчиняются вышеуказанному правилу.

В узбекском языке употребление однородных членов без послелога и аффикса и сохранение их только при последнем не является обязательным. Иногда для сохранения стиля или соблюдения рифмы в стихах и вообще в исключительных случаях аффикса однородных членов могут сохраняться.

Согласование сказуемого с однородными подлежащими. Если в русском языке в предложении стоят два или несколько подлежащих, то сказуемые после них ставится во множественном числе.

Согласование сказуемого с однородными подлежащими в узбекском языке несколько отличается от согласования в русском языке. Если в узбекском языке в предложении однородные подлежащие, выраженные именами существительными, обозначающими неодушевленный предмет, стоят перед сказуемым, то оно ставится в единственном числе. Молодость и природа ускорили мое выздоровление. – Yoshlik va tabiat mening sog'ayishimni tezlashtirdi.

В русском языке, если сказуемое стоит перед однородными подлежащими, выраженными существительными в единственном числе, то оно ставится в единственном числе, согласуясь с ближайшим подлежащим.

Мне светят солнце и луна. Если однородные подлежащими выражены личными местоимениями, то сказуемое при них ставится во множественном числе: *Men va siz ertaga sahnada chiqishimiz kerak.*

Обобщающее слово есть член предложения, который является более общим обозначением для всех стоящих при нем однородных членов, например: У самых источников росли прекрасные деревья: тополи, дубы, ели, айва.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

PROBLEMS OF DEVELOPING RUSSIAN LANGUAGE STUDY SKILLS IN NON-LINGUISTIC UNIVERSITY STUDENTS

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ANNOTATION
This article discusses some methods of increasing competence in the study of the Russian language for students of non-philological specialties.
The article also discusses interactive methods in the process of teaching the skills of oral speech to students of non-philological specialties.
KEY WORDS: *interactive, non-philological, oral speech, innovative, pedagogical technology.*

ПРОБЛЕМЫ РАЗВИТИЯ НАВЫКОВ ИЗУЧЕНИЯ РУССКОГО ЯЗЫКА У СТУДЕНТОВ НЕЯЗЫКОВОГО ВУЗА

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Аннотация
В данной статье рассматривается некоторые методы повышения компетенции при изучении русского языка для студентов нефилологических специальностей.
В статье также рассматриваются интерактивные методы в процессе обучения навыков устной речи студентов нефилологических специальностей.
Ключевые слова: *интерактив, нефилологические, устная речь, инновацион, педагогическая технология.*

Специфике обучения студентов национальных групп в вузах посвящено немало работ, в которых ставятся и решаются актуальные задачи достижения лучших результатов в профессиональном речевом развитии [1,5]. Обучение студентов к письменной и устной речи является одним из перспективных направлений в преподавании русского языка как иностранного (РКИ) и направлено на развитие профессиональной компетентности будущих специалистов.

Изучение русского языка - сложная задача. Это требует сотен часов изучения и постоянной регулярной практики. Это также очень полезный опыт; изучение русского языка открывает двери в новые культуры и даже новые способы мышления. Изучение языка может быть сложной задачей. К счастью, технический прогресс сделал изучение русского языка намного более простым, увлекательным и удобным.[6, 83-86]

В эпоху глобализации обучать студентов русскому языку в вузе, не учитывая их профессиональную направленность, - значит игнорировать научную базу в данном направлении. Ведь социальный статус человека, в

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
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целом проявляется прежде всего в умении эффективно общаться в процессе профессиональной деятельности. Формирование и развитие языковой личности на основе знаний русского языка как единства взаимосвязанных
сторон системы и функционирования его законов в коммуникативном воздействии, формирование у студентов коммуникативных качеств, способствующих успешной работе с литературой по специальности, приобретение ими навыков самостоятельной работы с научной литературой
– вот задача преподавания русского языка в неязыковом вузе.

В современной системе образования созданы все условия для обучения иностранным языкам, в том числе русскому, с использованием современных педагогических и информационно-коммуникационных технологий. Использование созданных условий, создание новой методики обучения русскому языку на всех ступенях системы образования с использованием современных педагогических и информационно-коммуникационных технологий является одним из важных требований и задач современных педагогов.

В частности, ряд решений и мер нашего правительства, связанных с преподаванием иностранных языков, показывают важность всех требований и задач в этом направлении.[1]

Преподавателями нашей кафедры разработаны оригинальные учебные программы с учётом задач формирования навыков профессиональной деятельности будущих высококвалифицированных специалистов на русском языке, необходимости работы наших студентов как с литературой по избранной специальности, так и с общественно-политической, научной, публицистической и художественной литературой. Поэтому инвариативное представление комплекса знаний, умений и навыков по предмету является основой речевой подготовки и определяет её цели, структуру и содержание.

В ходе реализации этих решений получили дальнейшее совершенствование организация непрерывного обучения русскому языку на всех уровнях системы образования, а также обеспечение современными учебно-методическими материалами.

В результате подрастающее поколение сможет в полной мере использовать все условия и возможности для развития достижений мировой цивилизации и мирового информационного сотрудничества и связи.

В традиционной системе обучения преподавание русского языка студентам, не являющимся филологами, основывалось только на практической грамматике. В результате учащиеся хорошо осваивают грамматику, но испытывают трудности, когда дело доходит до правильной речи или произношения слов. Я думаю, пришло время отказаться от простоты.

Образовательные рабочие программы студентов-нефилологов по предмету русский язык должны быть реформированы. Необходимо добиться параллельного ведения всех аспектов в ходе урока, проводимого по-новому. Данная теория закрепляется различными упражнениями, играми, дебатами и дискуссиями на самом уроке.

Вот несколько примеров методов и приемов организации учебного процесса для студентов-нефилологов и достижения положительных результатов:

1) вводится полное вовлечение обучающихся в учебный процесс и ни один обучающийся в группе не остается без внимания;

2) уровень знаний и обучаемость студентов группы изучается индивидуально и на этой основе им даются задания;

3) на уроке в основном говорят по-русски, а непонятные слова стараются объяснять другими вариантами или жестами вместо непосредственного перевода;

4) разделение на малые группы, работа в форме рассуждения, занятие переводом текста, высказывание мнения, используются методы взаимообъяснения;

5) создается возможность учащимся свободно мыслить, а допущенные ошибки не прекращаются внезапно, а после того, как учащийся высказывает свое мнение, совместно анализируются и подкрепляются примерами;

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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6) организуются различные грамматические, лексические, тематические и другие игры. Роли распределяются в зависимости от знаний студента;

7) Рекомендуется рассказывать истории по разным красочным картинкам, смотреть короткометражные фильмы и вместе их обсуждать, слушать актуальные по теме новости и пытаться понять.[2]

Важным фактором повышения эффективности обучения считается формирование теоретических знаний и практических навыков в учебном процессе, обеспечение восприятия и восприятия учебного материала в разных формах, через разные органы чувств. Анализы усвоения содержания образования показывают, что в образовательном процессе во всем мире используется более сотни методов педагогических технологий. Соответственно, независимо от того, проводятся ли уроки русского языка в традиционной или интерактивной формах, на уроке используются следующие 11 методов обучения: лекция, 4-ступенчатая, мозговой штурм, работа в малых группах, ролевая игра, рабочая игра, тур. обсуждение, проект, инструктивный текст... важно использовать их вместо них. Для этого учителю необходимо досконально знать свой предмет и больше работать над собой.

Слово «интерактивный» является английским и означает взаимное действие, сотрудничество. Д. Н. По определению Кавтарадзе, «Интерактив — это образовательная технология, основанная на взаимном сотрудничестве внутри группы и связанная со свободой учащегося в решении учебных задач». [3]То есть сотрудничество педагога с группой, взаимное сотрудничество группы, активность учащегося, опора на опыт группы (а не учителя) и опора на принципы обратной связи являются основными требованиями интерактивного метода.

Педагогическая технология – педагогический процесс, осуществляемый в определенной последовательности и порядке, учитывающий потребности и возможности обучающихся, направленный на достижение конкретных целей, тщательно спланированный, направленный на повышение эффективности воспитания и обучения и гарантирующий достижение окончательный результат. Наличие у учителя естествознания электронной литературы для чтения, электронных мультимедийных учебников, не только текстовых и наглядных, но и аудио- и анимированных методических указаний, предназначенных для совершенного самостоятельного обучения естествознанию, имеет большое значение для овладения учащимися наукой. В целях повышения эффективности содержания образования необходимо внедрение новых педагогических и информационных технологий в образовательных учреждениях республики, проведение учебных занятий с использованием новых интерактивных методов и средств, в том числе дистанционное, проведение компьютеризированных конференций, создание электронных учебников, а также использование их в учебном процессе приносит свои плоды.[4]

Поток педагогических технологий быстро распространился почти во все развитые страны, был признан такой престижной организацией, как ЮНЕСКО, и в настоящее время успешно принят и используется во многих странах. Ученые-педагоги и практики высших учебных заведений нашей страны стараются использовать научно обоснованные передовые технологии в образовательной практике, адаптируя их к социально-педагогическим условиям Узбекистана.

Особое внимание следует уделить методам обучения, которые являются одним из элементов образовательного процесса, поскольку метод основан на решении конкретной задачи и является продуктом практического или теоретического изучения иностранного языка.[5]

Учитель – главный исполнитель образовательной реформы. Так, основной процент усвоения основывается на организации урока учителя, его педагогических способностях, знаниях и опыте. При этом необходимо добиться того, чтобы каждый преподаватель мог усвоить, обработать и применить большой объем информации за короткий промежуток времени.

В заключение следует сказать, что перед каждым поколением стоит задача изучения и освоения знаний, созданных человечеством, и единственный способ добиться этого – повышение знаний, навыков и квалификации молодого поколения.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

MORAL EDUCATION AT THE ENGLISH LESSON IN GENERAL SCHOOLS

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ANNOTATION
This article discusses the moral education of students in English lessons. A list of goals, objectives and methods of moral education at school is given, the moral qualities of a person are indicated, which are formed through a foreign language. The essence of such concepts as "moral education", "goals and objectives of moral education", "conditions for the effective formation of the moral behavior of schoolchildren", "methods of morally directed teaching", "individual moral experience", "personal qualities of the student" is revealed.

The relevance of the issue of moral education of schoolchildren is determined.

The significance of the content side of the discipline "Foreign language (English)" in the process of moral education of students is analyzed and revealed. A list of topics and exercises is given that contribute to the creation of the necessary basis for the effective mastery and demonstration of the moral qualities of schoolchildren in foreign language classes.

KEYWORDS: *English language, moral education, aesthetic and ethical cultures, values, patriotism, skills and habits, social and cultural sphere, spirituality.*

НРАВСТВЕННОЕ ВОСПИТАНИЕ НА УРОКЕ АНГЛИЙСКОГО ЯЗЫКА В ОБЩЕОБРАЗОВАТЕЛЬНЫХ ШКОЛАХ.

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Аннотация
В данной статье рассматривается нравственное воспитание учащихся на уроках английского языка. Дается перечень целей, задач и приемов нравственного воспитания в школе, указываются нравственные качества личности, которые формируются посредством иностранного языка. Раскрывается сущность таких понятий, как «нравственное воспитание», «цели и задачи нравственного воспитания», «условия эффективного формирования нравственного поведения школьников», «приемы нравственно направленного обучения», «индивидуальный нравственный опыт», «качества личности ученика».

Определяется актуальность вопроса нравственного воспитания школьников.

Анализируется и раскрывается значимость содержательной стороны дисциплины «Иностранный язык (английский)» в процессе нравственного воспитания учащихся. Дается перечень тем и упражнений, которые способствуют созданию необходимой основы для эффективного овладения и демонстрации нравственных качеств школьников на занятиях по иностранному языку.

Ключевые слова: *английский язык, нравственное воспитание, эстетические и этические культуры,ценности, патриотизм, навыки и привычки, социально-культурная сфера,духовность.*

A foreign language at school is an integral component of the learning process. A foreign language acts as a means of forming and educating a morally responsible person, as a means of communication, knowledge,

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understanding and interpretation of the facts of a different culture, awareness of one's own culture and familiarization with it of representatives of other language communities. Among the goals of teaching a foreign language is an educational goal, which involves: the education of a humanistic worldview, respect for representatives of other cultures, patriotism; formation of a system of value orientations, moral and aesthetic views; education of a culture of communication, feelings, behavior, the need for self-education [1].

Main part. One of the components of the process of teaching both a foreign language and other subjects at school is moral education, aimed at familiarization with universal and national values, the formation of aesthetic and ethical culture, the education of a culture of self-knowledge and self-regulation of the individual, aimed at creating a need for self-development and social interaction, psychological culture [2]. Morality, in turn, is a set of historically established principles, norms and rules of human behavior, which were supported and are supported by the power of public opinion, traditions, habits, education system and personal beliefs [3]. The process of moral education itself is a purposeful, rich and organized pedagogical process that contributes to the formation of moral views, beliefs, value orientations, the formation of the ability to be guided in situations of moral choice by the motives of duty, conscience, justice, respect and love [4].

The relevance of the issue of moral education stems from the humanistic paradigm of modern pedagogy, aimed at shaping a personality capable of surviving in difficult socio-economic conditions and finding its niche in market relations without losing human dignity. To do this, it is necessary to solve the problem of overcoming the contradictions between the system of national and universal values approved by the progressive public consciousness and the real mores of the microenvironment in which the formation of the initial life experience of schoolchildren takes place. It is necessary not only to introduce children to the system of humanistic values, to develop moral and aesthetic ideals in them, to accustom them to the correct assessment of their actions, to teach them to make the right choice in difficult life situations, but also to raise the moral and psychological culture of parents. The importance of the formation of moral experience was pointed out by Aristotle, A.S. Makarenko and V.A. Sukhomlinsky. Individual moral experience is considered as a motivational-need and operational readiness of a person to self-organize his behavior on the basis of moral principles and values developed by the public consciousness. They act as a motivational core for moral activity, in the process of which a person, realizing various types of duty, develops in himself certain life attitudes, personal qualities that characterize him as a person.

The conditions for the effectiveness of the formation of the moral behavior of schoolchildren include:

- The teacher's focus on the formation of moral motives and attitudes in children;
- Reliance on the theory of student-centered learning and best practices in moral education;
- a variety of methodological support in the formation of the moral experience of schoolchildren in the educational process: the selection of visual material, life situations with moral content, conducting workshops on ethical culture, creative use of the educational potential of one's subject (foreign language);
- timely resolution of contradictions between the moral values of public consciousness and the negative actions of the microenvironment through the organization of individual, group and collective forms of work of children's and parent teams [5].

Thus, the integrity of the formation of the experience of the moral behavior of schoolchildren determines: education, which is organized in the classroom; interactive activity in the lesson; relationships; collective and group tasks; inclusion of the child in all activities; reflection, etc. We must not forget that in order to consolidate the first positive results, it is necessary to give the student freedom of choice, note the positive aspects in his behavior and attitude, encourage with a word and treat with understanding all the student's feelings about his moral choice and self-determination [6].

Based on the foregoing, it is possible to represent the structure of the experience of the student's moral behavior as follows:

- Knowledge: historical and cultural values, ethical, aesthetic and spiritual values;

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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- Skills: make decisions in situations of moral choice, resolve conflict situations, analyze moral actions and situations, predict the results of behavior;

- Skills and habits: culture of behavior in everyday life, caring for others, behavior in society, positive interaction;

- personality traits: independence of thinking in the sphere of morality, reflexivity, value orientation of thinking, empathy, impression, a sense of the sublime and proper.

To implement the moral orientation of teaching, the teacher can use the following techniques:

- Presentation of the situation with moral content; - personal example of the teacher;

- Holistic intuitive perception of it;

- Sensual individual assessment;

-logical analysis of individual judgments-assessments, correlation of one's assessment with others;

- Introspection;

- Adequate praise;

- Practical consolidation of norms in a behavioral act [5, 6].

The experience of moral behavior will acquire a holistic character if there is a subject in the system of teaching schoolchildren that systematically includes children in various types of personally significant activities that form knowledge, skills, and habits of moral behavior. For schoolchildren of any level, such a subject can be a foreign language (English) [5]. A foreign language (English) as a school subject has a wide and comprehensive content side, which can be divided into the following areas and their components:

- social sphere: family, relationships, help around the house, friends, animals, housing, shopping and shopping, healthy lifestyle, good and bad habits, culture of life, interpersonal relationships;

- educational and labor sphere: school, study, foreign language lessons, rules of conduct at school, school traditions, choice of profession, plans for the future, education in Uzbekistan, the role of a foreign language;

- socio-cultural sphere: national and family holidays, cultural leisure, art, sports, international cooperation, cultural life of Uzbekistan, national character, rules of safe behavior; - social and educational sphere: the Republic of Uzbekistan (geographical position, climate, customs and traditions), prominent people of Uzbekistan, historical information about Uzbekistan and Great Britain, the state structure of these countries. Due to the diverse and deep subject-thematic content of teaching aids for schoolchildren in English, teachers have the opportunity to form the moral qualities of students, they can create various pedagogical situations related to the formation of the moral qualities of the student's personality. A foreign language contributes to the formation of such personality traits of a student as: politeness, gratitude, diligence, friendship and devotion, discipline, nobility, will, patience, mutual assistance, responsibility, sympathy, joy for others, fidelity, self-control, frugality and curiosity.

After analyzing the textbooks for schoolchildren in grades 3-6, we can state the fact that the topics: “Acquaintance”, “Family”, “My home and pets”, “At the lesson”, “Day off”, “Native land”, contribute to the formation, development and application of such morally oriented qualities as caring for oneself, loved ones and pets, love for parents, friendship, diligence, helping elders, discipline, compassion, love for the country, knowledge of the holidays and traditions of the native land, as well as gratitude.

The topics of grades 7 - 11 in English become more in-depth, extensive and more complex: "Studying at school and school life", "Relationships and friendship", "Memorable places", "Holidays", "Health and sports", "Art" , "Professions", "Youth", "Countries of the world", "The world around us". These complex and morally oriented topics are aimed at such educational activities, during which the personal meaning of the moral principles and norms of students is formed, realized, and experienced [7, 8].

The presence of a wide range of topics for study cannot be a guarantee of a productive and successful mastery of moral qualities. Both the content, and the goal, and the methods, and techniques, and the desire of the teacher and students must go together with well-chosen and morally oriented tasks and exercises. Here is just a small list of tasks

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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that will contribute to the rapid assimilation of both knowledge and moral norms, which will allow the teacher to conduct lessons for the benefit of students, for their moral formation and development:

- express your opinion, judgment, arguments;
- tell your story;
- give advice to the hero who finds himself in a difficult life situation;
- evaluate the actions and deeds of the characters in the story;
- analyze the situation and highlight the positive and negative motives of the behavior of the actors;
- write an essay to put forward their proposals;
- conduct an interview;
- to beat the situation and give it an estimated characteristic; - act as an expert on one of the topics;
- create a project about your country;
- "advertise" the best qualities of your classmate friend; - express praise or blame;
- share tips on how to find a true friend and maintain a good relationship;
- perform voluminous grammatical exercises to consolidate knowledge and educate the will;
- present the family tree and talk about family traditions; - compare the traditions and cultural holidays of your country and the country of the language being studied.

Having considered the possibilities of a foreign language in the process of forming the moral qualities of secondary school students, we can formulate the following conclusions:

1) the most important function of education is the formation of moral consciousness and moral qualities of students;

2) the specificity of the process of moral education is determined by its content;

3) the formation of the moral qualities of a student's personality is an integral part of the process of teaching a foreign language;

4) the content of the discipline "Foreign language" contributes to the mastery of certain moral qualities by students;

5) selected and carefully thought-out tasks and exercises in foreign language lessons create the necessary conditions both for the acquisition of moral qualities and for the manifestation of these qualities by students in situations created by the teacher.

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EPRA International Journal of Research and Development (IJRD)
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MAIN TYPES OF INTERACTIVE RUSSIAN LANGUAGE TEACHING METHODS IN AN ECONOMIC UNIVERSITY

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ANNOTATION
In this article, the author focuses on modern methods of teaching the Russian language in non-linguistic universities and expresses certain scientific views.
The demand for learning and teaching the Russian language is currently increasing. This encourages science teachers to take responsibility for their work.
KEY WORDS: *Russian language, economic terminology, teaching, methods.*

ОСНОВНЫЕ ВИДЫ МЕТОДОВ ИНТЕРАКТИВНОГО ОБУЧЕНИЯ РУССКОМУ ЯЗЫКУ В ЭКОНОМИЧЕСКОМ ВУЗЕ

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Аннотация
В данной статье автор акцентирует внимание на современных методиках преподавания русского языка в неязыковых вузах и высказывает определенные научные взгляды.
Спрос на изучение и преподавание русского языка в настоящее время возрастает. Это побуждает учителей естествознания брать на себя ответственность за свою работу.
Ключевые слова: *русский язык, экономическая терминология, обучение, методы.*

Русский язык почитается как язык, имеющий свое место в развитии мировой науки, особенно в экномическом вузе. Экономист, не знающий русского языка, не будет зрелым специалистом в своей профессии. Потому что, русский язык является основой бизнеса.

Именно поэтому особое внимание уделяется преподаванию русского языка в неязыковых вузах. При обучении русского языка учителя естественных наук хорошо используют на уроках различные технологии, чтобы развивать у студентов практические навыки. К каждому уроку они применяют новые педагогические технологии, уделяют особое внимание созданию новых поколений учебной литературы с целью повышения эффективности уроков.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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В обучении студентов русскому языку эффективно используются различные педагогические технологии. Эти технологии признаются продуктом работы студента. Причина в том, что учитель естественных наук не только создает эти технологии, но и мобилизует все свои знания и умения. Его продукция будет показателем мастерства студентов.

При обучении русскому языку и основам бизнеса в экономическом вузе широко используются такие методы, как тренинг, программированное, компьютерное обучение, дискуссия, кейс-метод, деловые и ролевые игры[1].

Под тренингами подразумевается учебная технология моделирования специально заданных ситуаций, где студенты имеют возможность развить и закрепить необходимые знания и навыки и обобщить свой практический опыт. Программированное обучение позволяет достичь высокой степени структурирования дидактического материала и выполнить пошаговую оценку степени его усвоения. При этом информация представляется небольшими блоками в печатном виде или на мониторе компьютера, а студенты имеют возможность работать в удобном для них темпе, выполняя задания, показывающие степень усвоения материала[3].

Целью учебной дискуссии является процесс поиска. При этом педагог создаёт и поддерживает благоприятную психологическую обстановку на занятии и обеспечивает правильность выводов. Этот метод позволяет максимально использовать теоретические знания и практические навыки студентов, способствует лучшему усвоению изучаемого ими материала, что объясняется тем, что в групповой дискуссии они формулируют доказательства, обосновывают принципы и подходы, предложенные преподавателем.

Целью кейс-метода является закрепление знаний, полученных студентами на занятиях и их экспертиза, глубокий анализ информации, выявление ключевых проблем, определение путей их решения и формирование программы действия[4].

Практические ситуации могут быть разработаны на основе описания реальных событий или искусственно сконструированы. Следует выделить следующие этапы работы обучающихся над практической ситуацией: знакомство с ситуацией, выявление проблем, анализ имеющейся информации, формирование альтернативных решений, оценка предложенных альтернатив, подготовка решений по итогам рассмотрения практической ситуации, презентация результатов проведенного анализа, обсуждение выступлений и подведение итогов.

Метод деловой ролевой игры представляет собой персонифицированную игру с различными, зачастую противоположными, интересами её участников. Этот метод помогают формировать следующие важные профессиональные компетенции: коммуникативные способности, толерантность, умение работать в малых группах, самостоятельность мышления. Игра такого типа является разновидностью имитационного моделирования, связанного с исполнением соответствующих ролей и представляющего собой «заместителя» реальных ситуаций повседневной жизни и профессиональной деятельности[2].

Этот метод очень эффективен, к примеру, при проведении обобщающего семинарского занятия по теме « Бухгалтерский учет». В деловой ролевой игре «Аудитор и руководитель фирмы», организованной на таком занятии, может быть отражена деятельность узких специалистов: бухгалтера, экономиста, менежера, маркетолога, роли которых исполняют студенты. При этом занятие планируется с учётом эффективности усвоения знаний, а также осуществляется реализация его структурных компонентов в соответствии с принципами многократного вариативного повторения. В ходе игры студенты могут выполнять русско-узбекский и узбекско-русско переводы экономических терминов, их конструирование по терминоэлементам, осуществлять пояснение их общего смысла, сравнивать роль русского и узбекского языков в экономической терминологии и в экономике в целом, читать и писать по - русски названий денежных операций процессов и состояний, обозначающих названия наук, разделов экономики, методов исследования, анализировать термины по экономике и употреблять в речи термины, обозначающие название операций.[5].

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Кроме того, этот метод способствует развитию креативных качеств личности, эрудиции, профессионального поведения, речевого общения и усвоению этических норм межличностного взаимодействия. Интерактивные методы обучения развивают способность обучающихся выявлять проблемы, собирать и анализировать информацию, готовить альтернативные решения и выбирать из них наиболее оптимальное, владеть техникой общения, а также способствуют успешному формированию у них общекультурных и профессиональных компетенций[1]. Всё это успешно формируется при выборе наиболее оптимальных методов обучения и воспитания. Современная педагогика предусматривает тесное взаимодействие педагога и обучающихся во всех звеньях образования, что достигается путём широкого внедрения интерактивных технологий в процесс обучения. В связи с этим, приоритетными сегодня являются методы, где главное внимание уделяется практической отработке знаний, умений и навыков.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

TEACHER QUALITY AND ACADEMIC PERFORMANCE OF STUDENTS IN PUBLIC SECONDARY SCHOOLS IN RIVERS STATE, NIGERIA

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ABSTRACT
This study examined teacher quality and academic performance of students in public secondary schools in Rivers State, Nigeria. Three objectives with corresponding research questions and null hypotheses guided the study. Correlational survey research design was adopted for the study. The population of this study comprised of all the 6,893 teachers of 291 public senior secondary schools in Rivers State. A proportionate stratified random sampling technique was adopted to select a sample size of 1,033 teachers representing 15% of the entire population. Two instruments titled: Teacher Quality Scale (TQS) and Academic Performance Scale (APS) were used for this study. Cronbach alpha reliability test was conducted to ascertain the reliability of the instruments, of which the reliability coefficients of Teacher Quality Scale and Academic Performance Scale were 0.89 and 0.83 respectively. Research questions 1-3 were answered with the use of Pearson Product Moment Correlation, while z-ratio correlation statistics was used to test the corresponding hypotheses at 0.05 significance level with the help of statistical package in social science (SPSS). The result of the study revealed that, there was a very weak and positive relationship between teacher's teaching methods and academic performance of students, while teacher's time management and subject mastery were found to have moderate and positive relationship with academic performance of students in public secondary schools in Rivers State. Consequently, the study concludes that that though there are quality teachers in public secondary schools in Rivers State, their quality does not reflect much on students' academic performance. Based on the results and conclusion, the study recommended among others that supervisors from the school board and principals should step up their supervisory roles and techniques to ensure that teachers vary their teaching method. Also, teachers should be motivated by the government through Ministry of Education to participate actively in training programmes and workshops to update their knowledge and pedagogical skills on time management.
KEYWORDS: *Teacher, Quality, Students, Academic Performance*

INTRODUCTION

Education in a simple term has to do with acquisition of knowledge and skills for individual and societal development. It is very vital for emancipating mankind. Each society puts a lot of capital on it to ensure that the entire generation acquires the necessary skills, knowledge and the desired attitudes critical for future survival. However, owing to educational value, the success of education is measured through assessment in examination. Students' academic performances are assessed to ascertain if the set educational objectives and goals have been achieved. This however, boils down to the qualities of teachers and their workplace. Education at secondary school level is the bed rock and foundation towards higher knowledge in the tertiary institutions. It is an investment as well as instrument that can be used to achieve a more rapid economic, social, political, technological, scientific and cultural development in the country. However, the quality of education one receive especially at the secondary school level is dependent on the quality of a teacher.

A teacher is an instructor, facilitator, educator or a person who imparts knowledge or has the ability to transfer knowledge to the students. A teacher is a person who teaches the students with the allocated time in the school to foster learning. They play an important role in ensuring quality education delivery. The most common role the teacher play is to dispense pertinent knowledge to the students by following a stipulated curriculum that guides that level of education. Teachers, as important members of the school

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play pivotal roles in educating the students. Teachers use different teaching methods in teaching to ensure knowledge is dispensed. They set the tone of their classroom, build warm environment, and become role model. A teacher is responsible for the emotional, behavioural, planning, preparing and effectively teaching students in a class to support or enhance their success. Far beyond that, he carries out the role of a parent, counselor, mentor and many others. However, the primary role of a teacher is to impart knowledge to his students and ensure that their performance increase over time.

The teachers is expected to ensure a good progress in the performance of his students, monitor their emotional, social and moral development. He can help to address social problems that affect the student success. The teacher is projected to have advance knowledge and skills in order to be efficient and effective in the classroom for instructional delivery. He is expected to be proficient in the use of technologies in teaching and in management of the classroom for students academic performance. All of these and many more are the role of a quality teacher. Teacher quality is a key determinant of students academic performance. It is referred as to those attributes or qualities that a teacher possess. These attributes include teacher's teaching method, time management, subject mastery and many others. Teachers with these qualities to an extent influence their student academic performance.

Teacher's time management refers to the process whereby a teacher organizes and plans the amount of time to teach or deliver a lesson in the classroom for achievement of school goals and objectives (Sahito, et al.2016). Honing such quality is very necessary for a teacher, so as to avoid time wastage. When a teacher manages his time, it enables him to plan and deliver the lesson for the day without getting the students bored or tired in the class, which will result in better performance of the students. Another teacher quality is his teaching method. A teaching method comprises the principles and strategies adopted by a teacher to enable student learning and understanding of what is been taught (Isa, et al., 2020). These strategies are determined partly on subject matter to be taught and partly by the nature of the learned. For a particular teaching method to be appropriate and efficient it has to be in relation with the characteristics of the leaner and the type of learning it is supposed to bring about (Isa, et al., 2020). Consequently, a teacher should design and select an appropriate teaching method that suits the nature of the subject matter and also how the students learn. This will help to promote a lot of creativity, effective teaching and learning process in the classroom, and as well enhance students performance. Commonly used teaching method may include dramatization, demonstration, lecture method, recitation, memorization, field trips or combination of all (Isa, et al., 2020).

Subject mastery is unarguably another teacher quality that is required from a teacher. According to Cohen (2010), teaching a course entails more than superficial knowledge of the subject. That is, the more a teacher understands a particular content, the more effective and efficient he will be to transfer knowledge to the students. For example, a teacher with the knowledge of Mathematics will deliver accurately and competently than a teacher who has little or no content knowledge on the subject. When a teacher has a strong content knowledge, it helps his students get better knowledge and understanding of the subject which translate or result in academic performance. Subject mastery helps the teacher to respond to students productively. Teachers understanding of the purpose and nature of a particular subject or discipline influences his/her manner or method of teaching, the ability to clearly explain and ask good questions, the ability to arouse students interest in the subject for better academic performance.

Academic performance is the outcome of education. It is the extent to which a student, teacher or institution has achieved their educational goals. Academic perforamce is commonly measured by examinations or continuous assessment but there is no general agreement on how it is best tested or which aspects are most important- procedural knowledge such as skills or declarative knowledge such as facts (Annie, et al., 2016). Nevertheless, it refers to how students deal with their studies and how they cope with or accomplish different tasks given to them by their teachers. Academic performance is the ability to study and remember facts as well as the capacity to communicate the knowledge acquired either verbally or in writing. A student behaviour can be regarded performance, when it is observable and measurable in a particular situation.

Overtime several indicators have been used to measure teacher quality. Each teacher quality index provides a single measure of teacher quality based on a larger number of teacher quality measures, such as teacher experience, certification status, academic ability and even stability at school. Although there is ongoing argument about whether there is a link or connection between objective measures of teacher quality (such as teaching method, time management and subject mastery) and students' performance in school. It is on this premise that this study sought to reexamine the relationship between teacher quality (proxied by teaching method, time management and subject mastery) and academic performance of students in public secondary schools in Rivers State, Nigeria.

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STATEMENT OF PROBLEM

The career of teaching come with a lot of excitement, personal reward, challenges and chance to encourage and support others to achieve their dreams and aspirations. This is possible with an excellent teacher who knows how to work with his/her colleagues, parents, other professionals and community members to inspire the students to perform better in their academic works. Through several rigorous process and training teachers acquire qualities that are essential in ensuring a long-lasting change in students' behaviour. With such qualities, teachers are expected to motivate, guide and encourage students to study hard to improve their academic performance.

However, there have been public outcries that the academic performance of students in public secondary schools in Rivers State is below expectation. Many of the students perform woefully in both internal and external examinations, some cannot even boast of five credit in their West African Examination Certificate (WAEC), while some can even cannot read fluently, speak good English nor even solve simple Mathematical problems. These problems and more are not peculiar to only the students in public secondary school in Rivers State, but report from the public and external examinations outputs has it that there has been a decline in the standards of education in Nigeria. The question then is that does it mean the qualities teachers' possess does not have a positive and significant link with students' academic performance? It is on this background that this study sought to determine the relationship between teacher quality and academic performance of students in public secondary schools in Rivers State, Nigeria.

Aim and Objectives of the Study

The aim of this study is to examine teacher quality and academic performance of students in public secondary schools in Rivers State, Nigeria. Specifically, the objectives of the study sought to:

1. Ascertain the relationship between teacher's teaching methods and academic performance of students in public secondary schools in Rivers State.
2. Determine the relationship between teacher's time management and academic performance of students in public secondary schools in Rivers State.
3. Find out the relationship between teacher's subject mastery and academic performance of students in public secondary schools in Rivers State.

Research Questions

The following research questions guided the study.

1. What is the relationship between teacher's teaching methods and academic performance of students in public secondary schools in Rivers State?
2. What is the relationship between teacher's time management and academic performance of students in public secondary schools in Rivers State?
3. What is the relationship between teacher's subject mastery and academic performance of students in public secondary schools in Rivers State?

Research Hypotheses

The following hypotheses were tested at 0.05 level of significance.

1. There is no significant relationship between teacher's teaching methods and academic performance of students in public secondary schools in Rivers State.
2. There is no significant relationship between teacher's time management and academic performance of students in public secondary schools in Rivers State.
3. There is no significant relationship between teacher's subject mastery and academic performance of students in public secondary schools in Rivers State.

METHODOLOGY

This study adopted a correlation survey design to ascertain if there is a relationship or co-variations among the variables using a quantitative method of research. The population of this study was made up of all the 6,893 teachers (i.e. 3,490 male and 3,403 female) of 291 public senior secondary schools in Rivers State. (Source: Planning, Research and Statistics Department, Rivers State, 2021). The sample size for this study was 1,033 teachers representing 15% of the entire population. The sample size was drawn from the entire population using the proportionate stratified random sampling technique. This ensured that all members of the population are given equal opportunity of being selected. The research instrument titled: Teacher Quality Scale (TQS) and Academic Performance Scale (APS) were used for this study. The instruments have two sections (A and B). Section A elicited demographic information from

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the respondents, while section B elicited information on Teacher Quality Scale and Academic Performance Scale. The two instruments were coded in line with the modified four-point Likert rating scale as follows; Strongly Agree (SA) = 4 Points, Agree (A) = 3 Points, Disagree (D) = 2 Points, Strongly Disagree (SD) = 1 Point respectively. Cronbach Alpha reliability statistics was used to test the reliability of the two instruments. The reliability coefficients of Teacher Quality Scale and Academic Performance Scale are 0.89 and 0.83. For the data that were analyzed, research question 1 to 3 were answered using Pearson Product Moment Correlation (PPMC), while z-ratio statistics was used to test the corresponding hypotheses at 0.05 significance level with the help of Statistical Package in Social Science (SPSS).

RESULTS AND ANALYSIS

As part of data collection efforts, the researcher designed and distributed 1,033 copies of the questionnaire to the respondents. One thousand and twelve (1,012) copies were retrieved and found suitable for analysis resulting in 97% retrieval rate.

Table 1: Distribution of Respondents by their Gender

S/No	Status	Frequency	Percentage (%)
1	Male	554	54.74
2	Female	458	45.26
	Total	**1012**	**100**

From the above Table 1, it was revealed that 554 of the respondents were male representing 54.74%, while the remaining 458 were female representing 45.26% of the total respondents.

Research Question 1: What is the relationship between teacher's teaching methods and academic performance of students in public secondary schools in Rivers State?

Hypothesis 1: There is no significant r relationship between teacher's teaching methods and academic performance of students in public secondary schools in Rivers State.

Table 1: Pearson Product Moment Correlation (PPMC) showing the relationship between teacher's teaching methods and academic performance of students in public secondary schools in Rivers State.

Variables	N	df	R	P (Sig.)	Decision
Teaching Method	1012	1010	0.172	0.081	Accepted Ho_1
Academic Performance	1012				(Not Significant) P > 0.05

Decision Rule: 0.00 – 0.19 = Very Weak, 0.20 – 0.39 = Weak, 0.40 – 0.59 = Moderate, 0.60 – 0.79 = Strong, 0.80 – 1.00 Very Strong

To answer the research question 1, results from Table 1 produced a correlation coefficient, 'r' of 0.172; which by percentage is 17%. This value shows there is a very weak and positive relationship between teacher's teaching methods and academic performance of students in public secondary schools in Rivers State. In other words, teaching method as part of teacher quality to a very weak extent correlates with academic performance. Hence, any improvement in teacher's teaching method will lead to a corresponding increase in r academic performance of students in public secondary schools in Rivers State.

For hypothesis 1 tested, it is revealed also from Table 1 that the correlation for hypothesis one shows a significant correlation at r = .172 where p-value = 0.081 (P>0.05). Since the p-value 0.001 is higher than the alpha level 0.05, we therefore accept the null hypothesis, thus, there is no significant relationship between teacher's teaching methods and academic performance of students in public secondary schools in Rivers State.

Research Question 2: What is the relationship between teacher's time management and academic performance of students in public secondary schools in Rivers State?

Hypothesis 2: There is no significant relationship between teacher's time management and academic performance of students in public secondary schools in Rivers State.

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Table 2: Pearson Product Moment Correlation (PPMC) showing the relationship between teacher's time management and academic performance of students in public secondary schools in Rivers State.

Variables	N	df	R	P (Sig.)	Decision
Time management	1012	1010	0.572	0.000	Rejected Ho_2
Academic Performance	1012				(Significant) P < 0.05

Decision Rule: 0.00 – 0.19 = Very Weak, 0.20 – 0.39 = Weak, 0.40 – 0.59 = Moderate, 0.60 – 0.79 = Strong, 0.80 – 1.00 Very Strong

To answer the research question 2, results from Table 2 produced a correlation coefficient, 'r' of 0.572; which by percentage is 57%. This value shows there is a moderate and positive relationship between teacher's time management and academic performance of students in public secondary schools in Rivers State. In other words, time management as part of teacher quality correlates with academic performance. Therefore, any improvement in teacher's time management will lead to a corresponding improvement in academic performance of students in public secondary schools in Rivers State.

For hypothesis 2 tested, it is revealed also from Table 2 that the correlation for hypothesis two shows a significant correlation at r = .572 where p-value = 0.000 (P<0.05). Since the p-value 0.000 is less than the alpha level 0.05, we therefore reject the null hypothesis, thus, there is a significant relationship between teacher's time management and academic performance of students in public secondary schools in Rivers State.

Research Question 3: What is the relationship between teacher's subject mastery and academic performance of students in public secondary schools in Rivers State?

Hypothesis 3: There is no significant relationship between teacher's subject mastery and academic performance of students in public secondary schools in Rivers State.

Table 3: Pearson Product Moment Correlation (PPMC) showing the relationship between teacher's subject mastery and academic performance of students in public secondary schools in Rivers State.

Variables	N	df	R	P (Sig.)	Decision
Subject Mastery	1012	1010	0.511	0.000	Rejected Ho_3
Academic Performance	1012				(Significant) P < 0.05

Decision Rule: 0.00 – 0.19 = Very Weak, 0.20 – 0.39 = Weak, 0.40 – 0.59 = Moderate, 0.60 – 0.79 = Strong, 0.80 – 1.00 Very Strong

To answer the research question 3, results from Table 3 produced a correlation coefficient, 'r' of 0.511; which by percentage is 51%. This value shows there is a moderate and positive relationship between teacher's subject mastery and academic performance of students in public secondary schools in Rivers State. In other words, subject mastery as part of teacher quality correlates with academic performance. Thus, any improvement in teacher's subject mastery will lead to a corresponding improvement in academic performance of students in public secondary schools in Rivers State.

For hypothesis 3 tested, it is revealed also from Table 3 that the correlation for hypothesis three shows a significant correlation at r = .511 where p-value = 0.000 (P<0.05). Since the p-value 0.000 is less than the alpha level 0.05, we therefore reject the null hypothesis, thus, there is a significant relationship between teacher's subject mastery and academic performance of students in public secondary schools in Rivers State.

Discussion of Finding

The first finding of this study revealed that there is a very weak and positive relationship between teacher's teaching method and academic performance of students in public secondary schools in Rivers State. In other words, this simple means that the teaching method adopted by teachers is not sufficient enough to contribute or improve the academic performance of students in public secondary schools in Rivers State. This result of the study is tandem with Adunola in Kayode and Ayodele (2015) who reported that

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regrettably, poor academic performance by the students in Nigeria is fundamentally linked to application of ineffective teaching methods by teachers to impact knowledge to learners. According to the scholar, most teachers in public schools in Nigeria barely vary their method of teaching. Adgoke in Ogide (2017) stated that in our institutions, teachers use mainly the lecture method which is a teacher – centered method and the implication is that learners are passive and learning tends to be superficial. Asikhia in Sahito (2016) found that, qualifications of teachers and students' environment factors do not influence students' poor performance but teachers' methods of teaching influence poor performance. According to Adunola in Kayode and Ayodele (2015), regular poor performance by majority of students is fundamentally linked to application of in effective teaching methods by teachers to impact knowledge to learners. Also, the finding confirms the findings by Hake (1998) as cited in Oke (2020) who reported that students' little or no active involvement in the learning process could lead them to perform poorly in their academics. This finding substantiate the hypothesis tested which revealed that there is no significant relationship between teacher's teaching methods and academic performance of students in public secondary schools in Rivers State.

The second finding of the study showed that there is a moderate and positive relationship between teacher's time management and academic performance of students in public secondary schools in Rivers State. In other words, time management as part of teacher quality correlates with academic performance. Therefore, any improvement in teacher's time management will lead to a corresponding improvement in academic performance of students in public secondary schools in Rivers State. This result corroborates the findings of Isa, et al (2020) who observed that there is a positive relation between time management of teachers training and performance of students in the classroom. That's why it was recommended that teachers should improve their time management skills through consciousness about controlling their time (Kayode & Ayodele, 2015). If a teacher who possess good quality especially in time management, findings from Akinwonmi (2006) as cited in Greewait (2021) reported that it has a significant impacts on students' academic performance. Hence, this is evident in the hypothesis tested which revealed that there is a significant relationship between teacher's time management and academic performance of students in public secondary schools in Rivers State.

Lastly, the third finding of the study revealed that there is a moderate and positive relationship between teacher's subject mastery and academic performance of students in public secondary schools in Rivers State. In other words, teaching method as part of teacher quality to a very weak extent correlates with academic performance. This means that, any improvement in teacher's teaching method will lead to a corresponding increase in r academic performance of students in public secondary schools in Rivers State. This finding is in consonance with Thomas and Amaechi (2019) who opined that subject mastery content of a teacher has a strong relationship with the quality of teaching and academic performance of students. Concurring to this view, Shanes and Latham (2012) buttressed that when a teacher has a strong content knowledge he is better able to assist in the cognition and transmission of knowledge to students. The teacher specializes on the subject(s) to be taught which generally equips the teacher with scholarly knowledge of those subjects and integrates with professional education leading to new understanding and skills for professional performance in the school for students performance. Also in line with the finding, Darling-Hammond in Oke (2020) postulated that among other things, teachers knowledge of teaching subject matter and qualifications attained in teacher training largely determine the effectiveness of a teacher in his work environment and as well how he/she prepare the students for better grades. However subject mastery knowledge is a necessary skill for all teachers because it helps the teacher function effectively in arousing better performance in his students. Without continuously learning, the teacher might have an encounter with precocious students losing baffling questions, if not given accurate respond/feedback embarrass teachers and undermine their authority in the classroom (Darling-Hammond, 2006 as cited in Oke, 2020). Therefore, there is a significant relationship between teacher's subject mastery and academic performance of students in public secondary schools in Rivers State.

CONCLUSION

From the finding of the study, it could be concluded that though there are quality teachers in public secondary schools in Rivers State, their quality does not reflect much on students academic performance. It was observed that there is a very weak and positive relationship between teacher's teaching methods and academic performance of students, while teacher's time management and subject mastery was found to have moderate and positive relationship with academic performance of students in public secondary schools in Rivers State.

RECOMMENDATIONS

The following were the recommendations for the study:

1. Supervisors from the school board and principals should step up their supervisory roles and techniques to ensure that teachers vary their teaching method. Stepping up their supervisory roles would not only keep the teachers alert, but enable them to work diligently to improve on the academic performance of the students.

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2. Teachers should be motivated by the government through Ministry of Education to participate actively in in-service training programmes and workshops to update their knowledge and pedagogical skills on time management. This would help them vary their methods of teaching to suit the subject matter to be taught for students' better understanding and academic improvement.
3. In a bid to sustain and improve teachers' subject mastery, school administrators should encourage teachers to take time to plan and prepare their lessons before going to the classroom.

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EPRA International Journal of Research and Development (IJRD)
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SOCIO-EDUCATIONAL PERSPECTIVES: A STUDY ON HUMAN ADJUSTMENT

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Article DOI: https://doi.org/10.36713/epra12233
DOI No: 10.36713/epra12233

ABSTRACT

Individual attitudes regarding social objects are referred to as social attitudes. Individual attitudes that are so closely influenced by group interactions as to become extremely standardised and consistent within the group are referred to be collective attitudes. Adjustment is that state of an individual who is capable of adapting to changes in their physical and social environment. In other words, adjustment is the behavioural process of resolving incompatible demands or needs that are impeded by environmental challenges. Both people and pets adapt to their surroundings. In this essay, researcher would like to concentrate on the numerous aspects of social beings and how they adapt to different spheres of life while displaying their social views.

KEYWORDS: *Adjustment, Attitude, Education, E-learning, Intelligence*

INTRODUCTION

Individual attitudes regarding social objects are referred to as social attitudes. Individual attitudes that are so closely influenced by group interactions as to become extremely standardised and consistent within the group are referred to be collective attitudes. While the majority of social attitudes are so universally inter-conditioned and standardised, other attitudes, such as those of antisocial and maladjusted people and of people who live in the past, are equally significant. The attitude is initially a trial response, which is an interrupted, substitute behaviour that develops within an incomplete adjustment response, but it has the potential to become the organism's permanent set.

The ability to adjust to changes in one's physical, vocational, and social environment is known as adjustment. In other words, adjustment is the behavioural process of resolving incompatible demands or needs that are impeded by environmental challenges. Both people and animals adapt to their surroundings on a daily basis. For instance, when their physiological state prompts them to seek food, they eat to state their hunger and so adapt to the hunger signal. When a person struggles to respond normally to a need or stress in their environment, adjustment disorder develops. A high quality of life depends on successful adjustment. The likelihood of developing clinical anxiety or depression, as well as feelings of hopelessness, anhedonia, difficulties concentrating, sleep issues, and reckless behaviour, is higher in people who have trouble adjusting.

INTELLIGENCE AND SOCIAL ADJUSTMENT

The psychological process of adjustment is how people deal with or manage the demands and difficulties of daily life. It implies conformity and is concerned with how a person adjusts to his or her surroundings and daily demands. Psychological adjustment aids the organism's ability to manage internal and external wants, desires, and conflicts as well as expectations and pressures from the outside environment. Numerous researches have been conducted, and the results demonstrate the existence of social beings that can adapt to their surroundings and participate in society. According to a survey, there are notable gender inequalities among secondary school pupils, but no distinctions were discovered in terms of where they live. There appears to be an urgent need for improvement because these inequalities are found to be highly significant for gender in all the domains of adjustment, including family, peer, and societal adjustment. Academicians, policymakers, families, and all other interested parties must create methods to support better coping mechanisms among secondary school kids as a matter of priority (Pramanik, et al. 2014). Undergraduate students were the subject of a study at Sidho-Kanho-Birsha University in India that examined adjustment skills in connection to gender, study stream, and social intelligence using samples from several colleges. The study found that undergrad students in the humanities and sciences did not significantly differ from one another in terms of their capacity for adjustment, but that they did considerably differ from one another in terms of their social intelligence (Kundu, et al. 2015). Another study of undergraduate students in the Purulia District of West Bengal, India, found that there were no appreciable differences in the attitudes toward social adjustment between male and female, rural and urban, rural male and urban male, and rural female and urban female undergraduate students (Ansary, 2022).

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Social scientists have also made the bold assumption that there may be a relationship between emotion and bodily characteristics like height and BMI. According to a study, there is a substantial correlation between IQ and height, a weaker correlation between IQ and weight, and there is no significant correlation between IQ and BMI (Karmakar, et al. 2016). A study that looked at higher secondary school pupils found a connection between emotional intelligence and adjustment, demonstrating how emotional intelligence impacts peer, home, and school adjustment. Therefore, students with strong emotional intelligence may successfully navigate life's problems (Kar, et al. 2016).

In actuality, leaders, social scientists, and educators have been worried about leadership styles and adjustment capacity. A research of undergraduate West Bengal students looked at the association between leadership style and adjustment ability. The findings showed a strong correlation between West Bengali undergraduate students' leadership style and adjustment ability. This shows that more adaptable students may lead more effectively since leadership involves both teamwork and psychological adjustment with others (Kar & Saha, 2021).

A study investigated the personality and social; adjustment of Chinese American and European American adolescents. The results of this study found that the Chinese American and European American adolescents became more similar to each other over time through developmental and acculturative processes (Huntsinger, C. S. & Jose, P. E. 2006). A study examined the parenting practices and child social adjustment: multiple pathways of influence. The findings of this study found that the parenting practices were related to peer-reported social behaviour, peer dislike and child social problem-solving (Domitrovich, C. E. & Bierman, K. L. 2001).

CREATIVITY AND SOCIAL ADJUSTMENT

No longer is creativity a biological constant. The most coveted quality of the human intellect is creativity (Saha & Maji, 2013). It is viewed more as a 'variant' that is constantly changed by the environment, socioeconomic situations, and cultural factors. Finding and cultivating a child's creative potential in the classroom has become more important since psychologists and educators realised the value of creativity in human development. The concept of 'creativity' is becoming more widely accepted, and everyone has some degree of creativity. These can be seen and accurately measured using a number of techniques. Programming and structuring an educational environment that will support the development and expression of creativity can foster this ability. Thus, educators have both a chance and a difficult responsibility to find and foster children's creativity. In truth, a school is where some concerted attempts can be made to establish the groundwork for fostering in children the fundamental abilities, skills, attitudes, and motivations required for self-realization and creative life achievements (Saha, 2012). Being sensitive to issues such as problems, deficiencies, gaps in knowledge, missing components, disharmonies, etc. is a necessary step in the creative process. Other steps include identifying the problem, looking for solutions, speculating, or formulating hypotheses about the deficiencies, testing and retesting these hypotheses, possibly revising them, and communicating the results (Saha, 2013). Boys are more creative than girls, according to a research, and there is no discernible difference between students in rural and urban areas. In terms of creativity, there is also no discernible relationship between residence and gender (Paul, et al. 2017). Another study was carried out in Birbhum District, West Bengal, to compare and offer data on the socioeconomic position, environmental awareness, and creative abilities of higher secondary school students with ages ranging from 16 and older. 300 pupils from eight higher secondary schools in the Birbhum District were the subjects of a random data collection. The findings showed that there are no appreciable differences between male and female pupils in terms of Socio-Economic status (SES), environmental awareness, and creativity (Saha, et al. 2012).

EDUCATIONAL AND TECHNOLOGICAL FACTORS

The internet is praised for providing the entire world with an enormous amount of aid. The many ways we utilise the internet for communication, finance, education, shopping, blogging, and other purposes has not only made our lives more limited but has also led us to undermine it (Gorain, et al. 2022). One's sociocultural life is being robbed by this excessive reliance on the internet, which also leads to social isolation and sadness. As a result, this dependency has shown to have a strong impact on the behavioural, cognitive, and emotional patterns that are initially influenced by biological and environmental factors. Internet dependence, social isolation, and personality traits are all closely related to one another (Mondal, et al. 2018). The first two factors described above have a cause-and-effect relationship, as well as a reverse relationship. Internet Dependency and Social Isolation are greatly influenced by personality traits. Dependency and social isolation are frequently seen to be the catalysts for altered personalities. Therefore, it would be more accurate to assess the difference between these three dependent variables when compared to any other collection of independent variables (Gorain, et al. 2021).

We are all living in a time of globalisation where technology has ingrained itself into every facet of our life. Modernization is advancing quickly, and technology has advanced enough to provide electronic learning (Kar, et al. 2014). Instead of teaching theoretical topics through lectures, a flipped classroom is set up to better build students' conceptual knowledge. It gives students the chance to engage in face-to-face classroom interaction as well as technology-based learning in a comfortable setting (Mahato,

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et al. 2022). The target language learners provide a difficult reality in the field of second language acquisition. Every learning setting presents teachers with a variety of students who, depending on their openness, inventiveness, and intelligence level, have various capacities for assimilation of learning experiences (Chakraborty and Saha, 2014).
A study explained the challenges and prospects of using e-learning among EFL students in Bisha University. The researcher suggest that comprehensive training of teaching staff as well as students in the field of e-learning skills and adopt a blended learning approach at the beginning of the implementation of full-scale e-learning (Ja'ashan, et al. 2020). A study on e-learning and students' motivation: a research study on the effect of e-learning on higher education revealed that the use of interactive features of e-learning increases the motivation of the undergraduate students for the learning process (EI-Seoud, et al. 2014). A paper examined the effectiveness of e-learning: an explorative and integrative review of the definition, methodologies and factors that promote e-learning effectiveness. This paper suggested that, the effectiveness of e-learning may very well be evaluated by the quality of the interaction provide ((Noesgaard, S. S. & Orngreen, R. 2015).

ATTITUDE TOWARDS ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

One of the most sensitive and important topics of the 21st century in today's bettering planet is sustainable development (Halder, et al. 2022). It is one of the terms that is most frequently used today. Since the publication of Our Common Future by the World Commission on Environment and Development in 1987 and Agenda 21 by the United Nations Conference on Environment and Development in 1992, the idea of sustainable development has permeated society and been integrated into a variety of daily activities. People are now beginning to carefully address environmental issues. To live a healthy and productive life, there are three interdependent components: our society, economy, and environment. The idea of sustainable development affects more than just our age today. In reality, it makes us more aware of the needs of our future generations (Saha & Maji, 2013). We would only be able to decide how to allocate their use effectively if we were considerate of the environmental services. Three factors are interwoven, and if they are used correctly in practical settings, they can provide a healthy, sustainable world from which everyone can profit. The fundamental tenet of sustainable development is the interdependence of society, the economy, and the environment. Information and differences on the degree of environmental awareness among teacher candidates in West Bengal, India, were obtained from a study on the topic. The findings showed that 1) in-service teacher candidates are more aware than pre-service candidates, 2) science candidate candidates are more aware than humanities candidate candidates, 3) male candidate candidates and female candidate candidates, level of environmental awareness are not significantly different, and 4) government-aided college candidate candidates and private college candidate candidates are not significantly different in relation to level of environmental awareness (Saha, 2012).

A study on environmental education and sustainable development says that the researchers concluded that environmental education, regardless of the manner in which it is connected to sustainable development, must face its own limits (Sauve, L. 1996). A study on education, sustainability and social learning revealed that the researcher concluded that we are living in a special moment of transition between paradigms and it is important to dare and create innovate pedagogical practices oriented by the guidelines of social learning and the values of sustainability (Jacobi, P. R., et al. 2016).

WOMEN IN SOCIETY AND ATTITUDE TOWARDS SOCIETY

In light of the past two crucial decades, feminism researchers have engraved essential protest to the way social science has outlined men, women, and society. Since the beginning, debates over epistemology, technique, and methodology have been intertwined with discussions on the best ways to correct inaccurate and incomplete accounts in the context of traditional analyses (Adhikari & Saha, 2021). One needed to observe the implications of the most obvious methods one may aim to modify the androcentrism of the traditional analyses in order to grasp the breadth and depth of the metamorphosis of social sciences required to identify women and gender activities. Women have been "added" to these analyses by feminists. We discover three different types of women who emerged as unavoidable candidates for this mechanism: women who contributed to public life and were already the subject of social science research; women who are social scientists; and lastly, women who had fallen victim to the most egregious and flagrant manifestations of male preeminence (Adhikari & Saha, 2021). A study was conducted on attitude towards women's participation in local politics in South Asia. Findings of this study showed that attitudes towards women's participation in local politics are overwhelmingly positive (Haug, M. et al. 2019).

Sometimes literature is quite important in shaping a person's perspective toward society. In The God of Small Things, Arundhati Roy takes on the role of a societal critic. She does not distance herself from the surrounding society, system, brutality, and injustices. Roy has combined imagination and history with pure creativity to capture the harsh truths of the culture. Indian society is governed by taboos, which occasionally have a tendency to sully the social balance. The situation is occasionally made worse by politics, political competition, and an unyielding desire for power. Naturally, the outcomes are predictable. Higher authority and social standing provide adequate justification for dictating to and persuading the subjugated, leaving their life open to attack (Adhikari & Saha, 2021).

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ATTITUDE TOWARDS HEALTH AND YOGA

Yoga is an age-old practise that combines mental, physical, and spiritual exercises. The Rigveda is the first text to discuss yoga. Human lives are said to transform for the better via the practise of yoga. Yoga is valued for its wide range of advantages since it relaxes the mind and builds physical strength (Saha, 2021). The benefits of yoga can be most clearly seen in students who are improving their memory and capacity to focus, as well as their physical health and mental peace. The focus of the current study is on Indian West Bengali Purulia district undergraduate college students' attitudes regarding practising yoga. Data In order to cluster a set of objects, they must be grouped so that they are more similar to one another than to those in other groups. Five clusters are established after two-step cluster analysis in order to carry out the current investigation (Saha, et al. 2021). In a study, it was intended to determine how undergraduate students felt about yoga education. 295 undergraduate students' data were examined for the study. According to the study's results, there is no discernible difference between undergraduate students at rural and urban colleges who are male and female in terms of their attitudes toward yoga education. Another finding of this survey demonstrated that there is no discernible difference between undergraduate students majoring in the arts and sciences in terms of their attitudes toward yoga instruction (Khatun, et al. 2022).

A study was conducted on attitudes toward yoga among secondary school students in Cuddalore District. The finding of this study also showed that there is a significant difference exists between Government and Self-finance secondary school students regarding their attitude toward Yoga (Sembiyan, 2019). A study on the attitude of teacher trainees towards yoga as an organized activity. The results of this study showed that arts and science teacher trainees of the training colleges had sound awareness, most of the arts and science teacher trainees' showed a favorable attitude towards Yoga (Nanaware and Palanethra, 2019). examined the effect of yoga on students' mental health. The findings of this study suggested that, yoga has a moderately large and lasting effect, at least for some months, reducing symptoms of distress and improving sleep quality among students (Ulleberg, P. et al. 2020). The findings of these studies revealed that a yoga program may be utilized as a stepping stone towards regular exercise among both the adults and children.

CONCLUSION

Social attitudes pertain to an individual's perceptions of social items. Collective attitudes are described as individual attitudes that are so strongly shaped by group interactions as to become incredibly standardised and constant within the group. The ability to adjust to changes in one's physical, occupational, and social environment is referred to as adjustment. To put it another way, adjustment is the behavioural process of addressing incongruent expectations or needs that are inhibited by environmental difficulties. Pets and people both adjust to their environment. The attitude is originally a trial response, which is an interrupted, replacement behaviour that emerges inside an insufficient adjustment response, but it has the ability to become the organism's permanent set. The better one's attitude towards the society and its objects, the better response we get from them, which in turn makes our living in a society better and comfortable.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

PROFESSIONAL AND COMMUNICATIVE COMPETENCE OF FUTURE TEACHERS OF ENGLISH AND ITS SIGNIFICANCE

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ABSTRACT
This article describes the professional and communicative competence of future English teachers and its content. The development of professional and communicative competence of a future English teacher as a mature specialist should help young people find their place in work, get a quality education, acquire high-quality language skills, develop information competencies, form interpersonal social and cultural communication. In this article, we have interpreted the opinions of many researchers regarding professional and communicative competence. In conclusion, the qualities of the professional and communicative competence of the future English teacher are highlighted. Also, when collecting all the considered components, the content and essence of professional and communicative competence and the formation of the most complex qualities of a person's personality, which are interconnected and mutually demanding, are clearly manifested.
KEY WORDS: *professional and communicative competence, pedagogical skills, language skills, mature specialist, competence, sociability , development of speech skills .*

To Come In

In recent years, the state policy in the field of education in the Republic of Uzbekistan has been recognized as one of the priority areas for the development of social society. As the President of the Republic of Uzbekistan Sh.M. Mirziyoyev said, "education is the most important and priority issue of any state and society, which is being addressed not only today, but also tomorrow ". [1] At a time when the role of our country in the world community is increasing, and cultural and economic ties between countries are strengthening, teaching a foreign language to young people who will create their future, developing speaking skills in a foreign language, teaching their communication is one of the most important current problems of the present. Through in-depth training in foreign languages, the goal is to prepare independent, knowledgeable specialists capable of ensuring the modern development of Uzbekistan at the level of international standards. To do this, it is necessary to prepare future English language teachers as specialists who fully meet international standards, develop their professional and communication skills, and fully realize their professional and creative potential.

The Action Strategy for the Further Development of the Republic of Uzbekistan defines priority tasks, such as "radical improvement in the quality of education, in-depth study of foreign languages" [2]. In this regard, the ways of developing the professional competencies of students of higher educational institutions, which determine the psychological and pedagogical features, professional and pedagogical aspects of teaching foreign languages. It is important to analyze the conditions and practice, didactic support for the organization of professional activities of future teachers of English, improve the content of foreign language education, increase the efficiency of the application of forms, methods and means.

The development of professional and communicative competence of a future English teacher as a mature specialist should help the younger youth find their place in the workforce, **get** a quality education, acquire high-quality language skills, develop information competencies, form interpersonal social and cultural communication, but most importantly - help the individual. An urgent task is to develop it to meet demand and create the necessary conditions for realizing its potential.

MATERIALS AND RESEARCH

According to scientists, the ability to communicate with students and their colleagues is also important in the work of future English teachers. In this case, it acts as a means of scientific and pedagogical communication between the teacher and students, a necessary condition for improving professional skills and creating a comfortable psychological atmosphere in the student audience. To do this, future English teachers must have special professional and communication skills: knowledge of the student's personality; organization of students' activities in the educational process in the form of cooperation, creative search; perception and correct assessment of the situation of communication; empathy, compassion, understanding of the personality of the student; harmony of respect for the personality of a student in demand based on humanistic methods of interaction, etc. [3]

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
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A review of the pedagogical and psychological literature showed that the professional and communicative qualities of future English teachers manifest themselves as a complex integrative phenomenon as professional skills that ensure the teacher's communication with other participants in the educational process, its continuous maintenance and development. The professional and communicative competence of future English teachers includes not only the knowledge, skills and abilities necessary for professional activities, the quality of a complex of personal qualities , but also the ability to communicate, self-improvement and development, a creative and responsible approach to professional activities. Because a teacher is not only an educated and advanced person in his field, but he must also be able to transfer his knowledge and intellectual reserve to others, be able to easily apply his theoretical knowledge in practice, have reflective, communicative and perceptual skills.

Psychological and pedagogical literature gives various definitions of professional and communicative competence:

Professional and communicative competence is a system of necessary internal resources , effective communicative construction , a set of actions within a certain framework of interpersonal relationships.[4]

It is for this reason that the main task of the educational process of future English teachers should be aimed at the formation and development of communicative competence, which is an integral part of their professional and pedagogical training. Here it is necessary to dwell on the meaning of the concept of "Communication". The word "communication" comes from the Latin word "communico", which means "to communicate, connect, deal". "Sociability", akin to the word "communicate", means "having the ability to communicate", "sociable" means "accessible, cordial", and "communicative" means "relating to communication".[5]

Communication is, first of all, a way of activity in which people's adaptation to interaction is manifested [6]. actions of different levels of complexity. Also, communication can be defined as one of the components of communication.

A person should be aimed at creating psychological conditions for the full expression of his thoughts, worldview, ideas of his interlocutors, at organizing a rich and diverse palette of means, at acquiring all perceptual, communicative, interactive aspects of adequacy "[7 **].**]

In general, communicative competence consists of the following specific integral features:

1. Socio-psychological forecasting of the basis of the communicative situation in which communication can take place.
2. Socio-psychological programming of the very process of communication, in which special attention is paid to the originality of the communicative situation.
3. Implementation of communicative processes in a communicative situation with the features of socio-psychological management.[8]

It should also be noted that communicative competence includes the following components:

- cognitive (associated with knowledge),
- emotional and behavioral.

Researcher V. V. Davydov [9], "the cognitive component is associated with the level of knowledge of another person and includes predicting the behavior of another person; the emotional component includes emotional compassion and presence, empathy, impact on another person, empathy and the ability to experience together, attentive attitude to the actions of a partner; the behavioral component primarily covers the mastery of verbal and non-verbal means of social behavior.

Thus, "communicative competence" is based on the knowledge and emotional experience of a person, and this is his ability to determine the direction of communication in various situations; this is a unique ability of a person to act effectively together with others, and it is achieved by understanding himself and others, the quality of interpersonal communication and the constant change of psychological conditions in the social conditions of his life environment.

DISCUSSION

On the basis of the above theoretical provisions, the concept of communicative competence of a future English teacher is specified.

The concept of communicative competence of a future English teacher requires the inclusion of integrated competencies necessary for the following actions:

- Assessment of situations of interpersonal perception and communicative communication (perceptual component);
- Introspection and self-evaluation in the process of communicative dialogue (reflexive component);
- Selection of suitable means of interpersonal communication ;
- Management of the process of communication and the corresponding regulation of human morality (ethical component) (Fig. 1) .

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

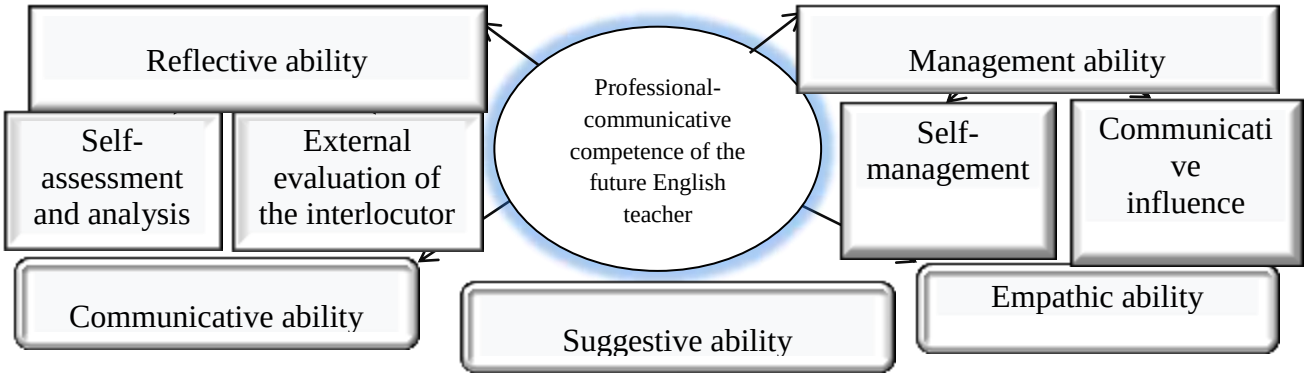

Figure 1. The relationship of communicative competence with the comprehensive improvement of pedagogical skills

Communicative competence can be expressed in the style of communication chosen by the future English teacher and in role positions in communication, which are provided by the goals of the leading interaction, characterized by stable expressive features, as well as communicative actions in the process of communication. communication situation. The communicative position of a future English teacher can reflect the ways to achieve the goals of communication and its attitude to the personality of the interlocutor, as well as specific requirements that can be implemented in the process of a specific communicative style of interaction. .

AS A RESULT

Based on this, the professional and communicative competence of a future English teacher can be considered as follows:

- a description of a person who has achieved great success in communication;
- the sum of abilities, personal qualities and acquired competencies;

– conformity of the specified results to certain standards of effective communication.

In conclusion, we can say that the professional and communicative competence of a future English teacher is :

- firstly, it is the sum of the competencies of the future English teacher in the field of communication, necessary to perform a certain activity;
- secondly, it is part of the life experience of the future English teacher , acquired in the course of his interaction with other people, his independent activity in various interpersonal situations;
- thirdly, these are the social and personal qualities of the future English teacher , which regulate the entire system of his interactions with the world, as well as with himself;
- fourthly, it is a characteristic that determines the capabilities of a person in various types of activity and at the same time corresponds to the specified type of activity;
- fifthly, it is the readiness of the future English teacher to organize his communication process in accordance with the above components in the event of real life situations. The presence of these components is a prerequisite for the successful implementation by a person of productive and professional activities in a certain area.

SUMMARY

the future teacher of English made it possible to distinguish two, interconnected and interconnected levels :

- the first level determines the manifestation of communicative competence in the most direct communication, that is, in the communicative behavior of a person;
- secondly, the future teacher of English should introduce pedagogical and communicative values through the specifics and focus of his professional motivation, his special need for communication.

When combining all the considered components, the essence of professional and communicative competence is clearly manifested, which forms the most complex qualities of a person's personality, interconnected and mutually binding. As a result, professional and communicative competence appears as one of the important professionally oriented characteristics of a future English teacher, the development of which is a priority for higher professional education. Modern stages of the development of society, new paradigms in education - all this fills the problem of the development of professional and communicative competence with new content.

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EPRA International Journal of Research and Development (IJRD)
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SUPPORTING AND ENABLING IMPROVEMENTS IN THE AREA OF CARE FOR ADULTS WITH DISABILITIES IN SINGAPORE

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Article DOI: https://doi.org/10.36713/epra12238
DOI No: 10.36713/epra12238

ABSTRACT

The purpose of this pilot study is to improve and facilitate enhancement in terms of care for adults with disabilities in Singapore. In many developed countries in the world, many if not all adults with special needs, live out in the community and are fully integrated with society. However, the majority of adults with disabilities in Singapore are residing in institutions because their families are not able to take care of them. There have been some attempts at mainstreaming adults with disabilities into the Singaporean community, however the number is very small. Although there has been much progress in the disability sector in Singapore, much work needs to be done in the adult disability sector. There are few research studies conducted on the adult disability sector in Singapore and the rest of the world (Happe & Firth, 2020; Lee & Burke, 2018). In Singapore and the rest of the world, there needs to be more of a person's centred model when working and supporting adults with disabilities. Thus, the premise of this study is how do we improve the quality of life of adults with disabilities in Singapore? How do we improve and facilitate enhancement in terms of care for adults with disabilities in Singapore?

KEY WORDS: *adults, disabilities, quality of life*

INTRODUCTION

Singapore has developed 'The Enabling Masterplan' which is a roadmap for Singapore to build a more inclusive society where persons with disabilities are empowered and enabled to realise their true potential. Thus, the goal of the 3rd Enabling Masterplan is to better enable persons with disabilities in Singapore to fulfil their aspirations in all aspects of life. One of the main recommendations for the Singapore government's enabling plan is to: To build the capacity and capability of disability service providers to enhance service quality. To improve the care as well as the quality of life for adults with special needs, there is an assumption that there is a direct and positive correlation between staff competency, confidence and expertise that would facilitate adults with special needs well-being. In this study, the investigator would look into the concerns and recommendations of the staff working with adults (clients) with disabilities. The project would be implemented in two voluntary welfare organisations (VWOs).

In this pilot project, the investigator intends to evaluate the efficacy of the staff's level of competency and areas of concern that may be lacking in their support for adults residing or in their care. This study involves the implementation of interviews and observation from four staff from each VWO organisation to facilitate the investigation of this study regarding improving and facilitating enhancement in terms of care for adults with disabilities in Singapore. There were be interviews, observation sessions, focus group discussions, feedback (sharing session with the staff) and a quantitative study (survey).

PURPOSE OF THIS STUDY

The purpose of this pilot study is to improve and facilitate enhancement in terms of care for adults with disabilities in Singapore. Some general and over-arching questions are:

i. How can we improve on this existing system because the majority of adults with disabilities in Singapore are living in institutions or segregated settings?

ii. What are some ways we can increase the quality of life for adults with disabilities in Singapore?

The questions listed above were needed to be explored and investigated to create a more in-depth understanding of the concerns and issues that adults with disabilities face in Singapore. In addition, this study seeks to extract data and information that may contribute to the well-being of adults with disabilities in Singapore.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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RESEARCH OBJECTIVE

The objective of this study is to examine the different ways to improve and enhance the care aspect for adults with disabilities. In Singapore, many of the staff working with adults with disabilities do not have the qualifications or experience to help these adults. With better-trained staff, the assumption is that it would benefit the clients and therefore the prognosis and expected trajectory for adults with disabilities would also be improved.

RESEARCH QUESTIONS

1. What are the perceptions of the staff and professionals on the current existing model that MSF (Ministry of Social Services) or MOH (Ministry of Health) has given to each of these organisations? Eg, inclusion versus segregation, funding model, etc.
2. Do the staff and professionals believe this model is a person-centred approach? Why or why not? How can we improve the existing system?
3. Are there concerns from staff and professionals regarding the care aspect of adults with disabilities? Eg. How do they intend to increase the quality of life for their clients?
4. How can we build on the capacity and capability of disability service providers to enhance service quality? Eg level of staff competency

HYPOTHESES

This study hypothesises that adults with disabilities in Singapore (institutions, centres and drop-in therapy services) are not receiving the quality of care needed to maximise their potential.
It is hoped that if most of the concerns that the staff and professionals are looked into and resolved, regarding the care aspect for adults with disabilities, the trajectory of these adults would be better and more adults would be integrated into the community.
Thus it is hoped that:

- Adults with mild learning difficulties would be taught skills to work and live independently.
- Adults with mild and moderate learning disabilities would be taught skills for open employment.
- Adults with moderate learning disabilities would be taught skills for the sheltered type of supported employment.
- Adults with severe learning needs or complex needs would learn skills to be independent in some of their self-help skills for the preservation of self-dignity and quality of life. For example, being able to shower on their own or change their clothes without another adult helping them.

METHODOLOGY

The next few paragraphs would be describing the research methodology for this study. It would describe the methodology of the study, the selection and profile of the participants, the measures used, and the procedures conducted for this mixed-method study. The participants include care staff from two organisations. There are three phases to this research study, including both qualitative and quantitative components.
Sampling for this study would be taken from the two VWO organisations as stated above. The two VWO organisations were purposely selected based on the disability sector in Singapore. These two organisations target different types of disabilities and challenges in the adult disability sector in Singapore.

Organisation	Reason Organisation was Selected
Organisation A	Clients are adults with congenital and acquired physical disabilities.
Organisation B	Clients are adults with autism and many display behavioral challenges. Many of these clients have moderate to severe autism.

PHASE I

Phase I involved the selection and interviewing of 4 participants from each organisation (8 participants in total). The interviews are based on four broad themes:
(a) perceptions regarding the existing model
(b) person-centred approach of the model
(c) concerns regarding the care aspect of adults with disabilities
(d) capacity and capability of disability service providers
In general, the interviewees felt that the funds provided in the current model were insufficient, the model was not a person-centred approach, and more regular and higher quality training for staff would be useful to enhance our staff's competency. They hoped that adults with disabilities could be given equal opportunities and resources to participate and engage in activities. They also agreed that it is important to work on the strengths and interests of the clients when teaching important skills. These interview responses then formed the basis for the development of survey questions for the next phase.

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PHASE II

Phase II involved the dissemination of a survey to 77 participants and 61 surveys were returned (completed). The survey consisted of 22 questions based on the same four broad themes from Phase I. In general, the coding and analysis of survey results revealed that participants agreed that more funds should be provided and that a model was a person-centred approach (which conflicts with the responses from Phase I), that more community engagement programmes could be implemented to raise awareness for people with disabilities that their clients should be taught social communication skills, that it is important to work on the strengths of the clients, and that more regular and higher quality training for staff could enhance staff's competency.

PHASE III

Phase III involved two focus group discussions with 14 participants from the two organisations. A total of 10 research questions were asked. These questions were broadly based on: (a) perceptions of the current funding model, (b) person-centric approach of the model, (c) perceptions of the individual care plan (ICP), (d) suggestions in terms of the services and care aspect for clients, (e) suggestions to improve the quality of life for clients, (f) suggestions for skills to teach to clients, (g) opinions regarding the qualifications and capabilities of staff, (h) confidence in handling and working with clients, (i) staff competencies, (j) staff upgrading.

In general, the coding and analysis of responses revealed that the model was not person-centric, and more funding should be provided. The Individual Care Plan (ICP) is an important component for the assessment of clients, and it is person-centric. An interviewee also suggested increasing the number of care staff to improve 'rehab quality', while another interviewee suggested providing funding for middle-income families. Some interviewees suggested teaching 'social skills' and 'independent daily living skills to clients. The interviewees generally felt confident and competent in working with their clients, however, they also agreed that a postgraduate in adult disabilities would be useful.

RELIABILITY AND VALIDITY OF RESEARCH STUDY

To ensure the reliability and validity of the study, appropriate research tools and analytical approaches were selected. For the qualitative and quantitative portion of this research, the reliability and validity of the analysis were based on the use of methodological triangulation, which in this study, combines different data sources including the completed surveys, interviews with 8 staff members, observation sessions of the 8 staff with their clients and the focus group discussions.

The triangulation of information collected served to prove the validity and soundness of the collected data. Furthermore, a second coder from the study team coded 30% of the interviews and focus group discussions for the computation of inter-coder reliability. For the observer section, the reliability of observations was established via (a) the use of rubrics, and (b) the computation of inter-observer agreement. Further, the findings of the observation sessions were triangulated with the interview questions with staff regarding their views on the services of care to adults with disabilities.

LIMITATIONS TO THE STUDY

There were some limitations to the study. Firstly, the foreign staff (i.e., those from Myanmar and India) faced some difficulties in understanding the survey questions due to the language barrier/difficulties. Although the survey was translated into the respective foreign languages by professional translators, some of the staff still do not understand the translated questions. This may have resulted in inaccurate responses. Secondly, some of the interviewees tend to respond very enthusiastically and may need prompts to be redirected to the main questions. This unfortunately extended the interview process. Thirdly, the small sample size of the study [mainly involving two Voluntary Welfare Organizations (VWOs) in Singapore] may not be representative of all the VWOs in Singapore. This may affect the internal and external validity of the study (Faber & Fonseca, 2014). Fourthly, it should be noted that the study only involves the opinions of staff in the respective VWOs. It did not include the opinions of the other stakeholders who also play a crucial role in the delivery of care services for adults with disabilities. These stakeholders include the clients themselves, their families, and other organizations such as the National Council of Social Services (NCSS) and the Ministry of Social and Family Development (MSF).

CONCLUSION

This study aimed to improve and enhance care for adults with disabilities In Singapore. The study consists of three phases, which included both qualitative (interviews and focus group discussions) and quantitative components (surveys). There are some conflicting results from the diverse participants in the different phases. Furthermore, the study has its limitations. In general, however, the results seem to show that more funding, more care staff, and more regular/higher quality training (i.e., postgraduate in adult disabilities) should be provided. It is also important to work on the strengths of the clients when teaching important skills. In doing so, it is hoped that adults with disabilities could be given equal opportunities and resources to engage in meaningful activities. This may eventually ensure inclusivity and the highest quality of care delivery and quality of life for adults with disability in Singapore.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

GOOD COMMUNICATION SKILLS: A PANACEA FOR IMPROVING THE PERFORMANCE OF THOSE WHO MANAGE HEALTH INFORMATION AT THE UNIVERSITY OF PORT HARCOURT TEACHING HOSPITAL, RIVERS STATE, NIGERIA

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ABSTRACT

The study looked at effective communication as a magic bullet for practitioners of health information management in UPTH, Rivers State, Nigeria. A multistage sampling technique was adopted, along with a descriptive study design. There were 225 participants, and a sample size of 140 was chosen. The tools utilized were checklists and questionnaires. Results indicated that most people agreed that there was no reasonable relationship between patients and providers in all sections of UPTH, according to 40 (66.7%) of the respondents who responded that health information management practitioners frequently used verbal communication skills to interact with patients, and 15 (25%) of the respondents who responded that they did not. Additionally, 340 (84%) YES responses and 65 (16%) NO responses indicate a lack of motivation and management support., lack of educational advancement as a barrier to HIMP has excellent communication skills. The management of UPTH, the Federal Government through the Federal Ministry of Health, Healthcare Partner Agencies, Health Records Officers Registration Board of Nigeria should collaborate and ensure the implementation of policies regarding adequate motivation, institutional support, availability of prerequisite infrastructure, and frequent training and retraining of health information management practitioners on communication skills improvement as well as on the use of technological tools/aids in performing their healthcare and related health services to ensure timely, accurate, effective, efficient, quality patient care services, and informed decision-making in the UPTH, and other Nigerian healthcare facilities.

KEY WORDS: *Communication Skills, Effectiveness, Health Information Management Practitioners, Panacea, and Performance*

I. INTRODUCTION

Every step of the process for delivering healthcare services requires communication. Health professionals must have adequate practical communication skills in order to accurately share patient information with another facility, a group of health information management practitioners, doctors, nurses, specialists, and other staff in a specific hospital with regard to how to manage chronic and endemic cases, treat acute/severe cases and incoming patients, handle epidemic and pandemic cases. Accordingly, [1] argued that effective communication skills facilitate the development of respectful and productive relationships with patients, their families, caregivers, and other stakeholders. They also make it easier to exercise personal leadership, improve conflict-resolution techniques, and inspire others.

Effective communication includes teamwork and collaboration, intercultural communication, critical thinking, and using a variety of communication techniques and media for expressing one's ideas and for understanding others [2]. It is not just about being eloquent, although that is undoubtedly a significant advantage. More importantly, in order to carry out job effectively, one must connect with others, address issues, seek knowledge, and have strong interpersonal skills. One must also be adaptable to positive

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change when it is required. When a health facility's information management department receives a patient's or client's first visit or phone call, it is essential that the department be staffed with professionals who are well-versed in communication techniques to ensure the delivery of high-quality healthcare services at all times. However, the health information management department at most hospitals has been characterized by a lack of qualified staff, a poor patient-provider interaction, and incorrect health records management techniques, all of which frequently result in the delivery of subpar healthcare services [3].

It is impossible to overstate the importance of effective communication skills for health information management practitioners. This is due to the fact that when health information management practitioners are poor and inefficient in their communication skills, there will be a drop in the delivery of high-quality healthcare in the hospitals and throughout the nation. It is crucial to remember that developing effective communication skills aids a healthcare professional in getting beyond obstacles that can stymie information sharing and decision-making. [4] characterized communication as the process of passing along ideas, attitudes, emotions, or behaviors from one person to another in order to address issues facing humanity and unite people for a shared goal. [4] also argued that health information management professionals (health practitioners) should take some required training courses to gain the necessary communication skills to be effective in their work at all times and ensure better health service delivery.
Because of this, [5] asserted that healthcare practitioners' communication skills have been deteriorating over time, despite significant emphasis being paid to the development of these skills in order to improve the quality of healthcare services delivered. On a similar vein, [6] noted that despite communication being a crucial component of the process of providing healthcare services (nursing), healthcare professionals (nurses) have little to no formal training in how to interact effectively with patients and their families. Therefore, [7] recommends that healthcare professionals continue to strengthen their communication skills in order to support the implementation of patient safety and the provision of high-quality healthcare services.

The professional needs effective communication skills to deal with different individuals and their diverse ways of life, cultures, and perspectives on a constant basis. Communication skills are essential for better service delivery, whether a manager is training staff, exchanging information with doctors, or working with the financial department. Additionally, among all life skills, excellent communication is likely the most crucial. One can share information with others through communication and understand what is being spoken to them. The act of communicating involves moving information from one location to another. It can be done verbally (using the voice), graphically (using logos, maps, charts, or graphs), non-verbally (using body language, gestures, and tone and pitch of voice), or in writing. Undoubtedly another essential skill set is written communication (using printed or digital media like books, periodicals, websites, or emails). Whether contacting vendors about program changes or sending communications to various administrative offices, the ability to communicate effectively and clearly is a requirement for health administrators and managers [9].

According to [4], in order to deliver effective and efficient health services in healthcare facilities, it is always important to combine many of these communication formats (verbal, written, visual, and non-vocal). It might frequently take a lifetime for someone to master the specifics of the full communication process because the world and events change so swiftly. Therefore, one must employ every technique at their disposal to ensure that they master every key communication skill that will elevate and distinguish them in the work of consistently delivering outstanding healthcare services devoid of bias. Health organizations with good communication policies typically increase their patients' capacity to satisfy their needs, whereas those without effective and efficient communication protocols invariably have a negative influence on patients' well-being. Communication skills among healthcare workers have been noted to need improvement [10]. Few recipients of health services are aware of the importance of good communication in healthcare settings for their well-being and the closing of gaps brought about by poor communication skills in the delivery of health services by healthcare professionals and health institutions. This study, which examined good communication as a panacea for practitioners of health information management at the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria, was built on these observations.

I.I STATEMENT OF PROBLEM

Every healthcare facility that has access to qualified personnel with strong communication skills frequently improves the healthcare demands that are met for its patients, fostering patient loyalty and retention. Effective connections with patients, their families, caregivers, and other stakeholders can be cultivated with the aid of good communication skills. Communication skills of healthcare professionals have been seen to be a major cause of poor patient-provider relationships and inconsistent health service delivery in many parts of the world. Numerous policies and strategies may have been implemented by health organizations to ensure the continuous development of healthcare practitioners' communication skills [1].

Although some researchers have conducted a limited number of studies on the communication skills of healthcare professionals and the provision of healthcare services, none have specifically addressed the issue of effective communication as a cure-all for the abilities of practitioners of health information management, with a focus on UPTH, Rivers State, Nigeria. As a result, the researchers made the decision to investigate the effectiveness of health information management practitioners' performances at the

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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University of Port Harcourt Teaching Hospital in Rivers State, Nigeria, in order to advance knowledge and offer remedies for the problems facing humanity.

I.II Aim and objectives of the Study: The purpose of this study is to ascertain the impact of effective communication abilities on practitioners' performances at the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria. While the study's goals also comprise: 1. To identify the various communication techniques employed often by health information management professionals at the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria. 2. To identify obstacles to practitioners' effective communication skills in their work at the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria. 3. To find approaches to enhance information management professionals' performance in communication at the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria.

I.III. Research Questions: To direct this investigation, three research questions were developed.
i. What kinds of communication techniques do professionals in health information management utilize at the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria? ii. What are the challenges to health information management practitioners' effective communication in their work at the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria? iii. How can health information management practitioners at the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria, improve their effective communication skills?

II. REVIEW OF RELATED LITERATURE

In order to ensure and accommodate medical, legal, and ethical norms, health information management practitioners (HIMP) manage and build health information programs. The upkeep, gathering, and analysis of data that is received by physicians, nurses, and other healthcare providers, including for-profit and nonprofit health partner organizations, is also fundamentally influenced by these HIMPs. Therefore, in order to provide high-quality healthcare services, these contributors to the healthcare data rely on the correct and reliable data managed by health information management professionals [11]. In another breakthrough, [12] established that the measurement of the impact of health care services on the population is frequently hampered by weak, uncoordinated, and a lack of trustworthy data and health records management procedures, which also has a negative influence on the general public's health.

Planning information systems, creating health policy, and determining present and future information demands are among the duties of practitioners in health information management [13 & 14]. Additionally, they claimed that HIMP frequently uses informatics to produce, gather, document, use, preserve, retain, and dispose of information in order to satisfy the administrative, professional, ethical, and legal requirements of health care records management. Health information management professionals oversee and build health information programs to make sure they adhere to ethical, legal, and medical requirements. In order to provide the general public with high-quality healthcare services, they are also essential to the upkeep, collecting, and analysis of data that is received by physicians, nurses, other healthcare professionals, and health partner organizations.

The correct collection, management, and use of information within healthcare systems enhances the determination of the system's effectiveness in detecting health problems, defining priorities, identifying creative solutions, and allocating resources to improve health outcomes in a timely manner [15]. Practitioners of HIM always work with clinical, epidemiological, demographic, financial, reference, and coded healthcare data. To facilitate the collection of consistent, comparable clinical information required for tasks like outcomes research, continuous quality improvement, and epidemiology, health information management practitioners must understand the language of health and how to communicate it with other stakeholders. They also need to understand the relationships between clinical terms used to describe special medical concepts and the more aggregated form of data collected with standardized classifications [16]. This indicates that those who work in health information management should develop effective communication skills in order to provide high-quality patient care.

In order to accomplish a specific objective, communication is sometimes viewed as a two-way process of exchanging or sharing ideas, thoughts, and information. According to Kuma's 2000 theory, communication is a process required to facilitate the intended change in human behavior and informed individual and community engagement to accomplish set goals. In recent years, communication has evolved into an interdisciplinary science that draws heavily from social science, where the human brain has significantly expanded for better clarity of thought and social inter-sectoral coordination. Providing individuals with information is communication's main purpose. It is the duty of the government, the media, and health information management professionals to enlighten the public with accurate and fair information, spark their curiosity, and empower them to make wise decisions.

The majority of people put a lot of consideration into key life decisions, sometimes over time and after multiple educational encounters. The cultural value, belief, and norm of the population affect their acceptance of knowledge. A fundamental component of human existence and mutual collaboration in fostering harmony, resolving crises, and improving economic growth

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as well as life expectancy quality is the availability of accurate, trustworthy, and timely information. One uses communication skills when offering and receiving various types of information. Examples include sharing fresh perspectives, emotions, or even project updates. Speaking, listening, watching, and empathizing with what has been heard are further communication skills. A new form of communication called a computer-based communication system has also greatly expanded the potential for knowledge and skill transfer. Additionally, it has made it possible to have direct, immediate conversation with anyone, wherever in the world, using email and any online chart. In a nutshell, [17] proposed that the computer-based communication system has developed into a rapidly-growing communication medium with enormous potential and has significantly impacted education in India due to the high rate of usage that is rising every day.

Interpersonal skills are those people employ when engaging in face-to-face conversation with one or more other people. This is especially true today, when healthcare delivery is becoming more complex and diverse. Listening is another component of interpersonal communication abilities. It is important to keep in mind that communication is always a two-way street and that receiving information requires active listening. People listen to the one speaking for a better comprehension during the communication process for around 45% of the time before acting on what they heard. Additionally, interpersonal communication abilities are crucial in a variety of situations and settings, including health systems and other places where people may come into contact with and engage with others. People with strong interpersonal communication abilities can collaborate more successfully and find lasting solutions to problems within and between teams or groups in both official and informal settings.

II.I Types of Communication Skills used by Health Information Management Practitioners

In order to effectively offer healthcare to beneficiaries and interact with other hospital stakeholders, health information management practitioners must possess strong communication skills. When patients or clients visit a hospital or require medical attention, they must regularly communicate with one another about new policies, procedures, and the status of activities as well as with patients and clients. According to [17], many educational institutions are implementing training programs in the areas of educating prospective employees how to communicate by first outlining the many forms of communication skills and their significance in human coexistence and in the provision of health services. Health care professionals can learn a variety of abilities in the many communication processes, such as written and oral communication, formal and informal communication, sign and symbol communication, and computer-assisted communication.

Even in a variety of situations, communication abilities go much beyond basic verbal and nonverbal communication. These communication skills encompass interpersonal, writing, and presentation abilities. Presentation techniques are not often used by a lot of healthcare professionals. According to the literature, good presentation abilities involve more than merely talking your way through a slide show while standing in front of a screen. It also includes the capacity to effectively communicate a certain point of view in small-group or large-group meetings, conferences, and seminars. As a result, practitioners of health information management must develop a number of basic abilities, such as the ability to consistently deliver information to patients, coworkers, and a group of people in a formal or casual context. More so, developing writing abilities is essential for all communication processes, including spoken language and face-to-face interactions (limited to the oral-aural type of communication). Another essential component of communication skills that a healthcare professional should possess is the capacity for clear and effective writing. Poorly written patient information frequently resulted in subpar treatment, a high number of needless deaths, a string of patient/caregiver legal claims, and inefficient use of the medical system's resources. The abilities one possesses and employs to maintain a healthy body and mind are referred to as personal skills. In conclusion, poor writing can frustrate the reader and possibly harm the reputation of the author and the organization.

II-I Barriers to acquiring good communication skills by health information management practitioners

The [18] assert that it is normal for patients to worry about their health and wellbeing. But according to a poll conducted in 2016, just 38% of adult in-patients with anxieties or fears could unquestionably locate someone in the hospital with whom to discuss their problems. There are several obstacles to effective communication, some of which are Time restraints, inadequate infrastructure, environmental problems including noise and privacy, pain and exhaustion, a lack of enabling policy and procedure, a lack of motivation and support, an inability to adapt to organizational policy changes, an absence of enabling policy and procedure; Use of vocabulary, values and beliefs, information overload, embarrassment and anxiety and Low levels of job satisfaction, indifference in one's career, or both.

II.II EMPIRICAL REVIEW

With a population of 70 and a simple random sample size of 60 health information management officers from two hospitals, [19] conducted a descriptive survey study on the evaluation of health information management practice among health records professionals in Osun State, Nigeria. Findings demonstrated that the non-computerization of health information in hospitals was caused by ineffective and inaccurate operational services brought on by a lack of technical knowledge and ICT capabilities. The findings demonstrated that the lack of professionally educated health information officers in the hospital, insufficient provision of

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working instruments, and missing and misfiled patient health records were all contributing factors to the poor work flow. The study concluded that the management of the hospitals should take immediate action to address the aforementioned deficiencies by hiring trained and certified health information officers and providing ICT facilities to allow for quick access to and sharing of patient health information among the hospital's medical staff.

The School of Health Technology in Minna, Niger State, Nigeria, employed a systematic review design study to examine the importance of health information management and the functions of health information management professionals in healthcare delivery systems. The results showed that because of the prevalence of onerous paper-based and fragmented health data management systems, especially in developing countries, health records have not yet been properly evolved into a process in healthcare delivery systems. The findings demonstrated that health information management specialists despise clinical coding procedures. The findings also showed that even while some of the practitioners work in environments where health information systems are used, they do not fully comprehend their own obligations to medical confidentiality. The results also demonstrated that health information management professionals have a skills gap in information technology that is incompatible with their responsibilities in health information systems. The study came to the conclusion that although paper-based records have many drawbacks, including the need for large storage spaces and challenges retrieving records, and computerized systems have been advocated, the paper-based system is legally more acceptable as documentary evidence because it is more difficult to tamper with the records without being noticed.

[21] conducted a study on ways to help doctors communicate more effectively. The findings demonstrated that healing a patient required a holistic strategy that takes into account factors beyond only treating an illness. The findings also showed that in order to provide patients with high-quality medical care, a doctor must possess a number of other abilities in addition to technical knowledge. The results demonstrated that a doctor's effective communication abilities increase patient compliance and general satisfaction. Findings showed that some fundamental characteristics of effective communication, such as attentive listening, empathy, and paying attention to both verbal and nonverbal aspects of communication, are commonly overlooked. Further research revealed the significance of having accurate knowledge on the nature, progression, and prognosis of the disease. The study found that formal training for doctors to improve their communication skills is essential and has been shown to enhance overall results; as a result, it recommended including formal training in communication skills in the medical curriculum and providing training for practicing doctors in the form of CMEs and CPEs.

More specifically, [22] looked at the literature on effective communication in nursing practice. The value of successful communication can be easily neglected because research shows that it is virtually always an automatic, unintentional action for the majority of people. The findings indicated that as communication is an essential component of nursing and a means through which nurses relate to patients, having some practical communication skills will improve the standard of healthcare services. The findings demonstrated that good communication has a direct impact on the wellbeing and satisfaction of patients. Results also showed that the traits of healthcare professionals and patients are the main causes of communication obstacles. The study came to the conclusion that using practical communication skills in healthcare settings improves not only patients but also healthcare providers in terms of their health and job satisfaction. The study suggested that more training be established to teach nurses how to employ effective communication in a professional setting, as well as knowledge of their own characteristics and techniques for understanding patients' signs and features.

In a similar vein, [23] investigated interactions between healthcare practitioners and patients with low socioeconomic status, applying the COM-B model to identify variables that influence healthcare providers' communicative behavior. According to the findings, 703 studies were gathered using a systematic review, and secondary data were examined using an inductive and deductive content analysis. The results showed that the COM-B model was used by classifying the secondary data and the systematic review results into the model's constituent parts. Studies have shown that those with lower socioeconomic position tend to have worse health than those with higher socioeconomic status. According to the findings, one possible explanation for the disparity in health is that healthcare providers communicate differently depending on their socioeconomic class. The findings also indicated that healthcare professionals frequently communicate in a biomedical manner with patients who have low socioeconomic level, indicating that these patients are not happy with the way healthcare professionals communicate with them. The results also demonstrated that there are significant differences between the characteristics that underlie effective communication between healthcare professionals and patients with low socioeconomic status and those factors documented in the literature about doctor-patient communication among other groups. Further research indicated that it is recommended that healthcare personnel use a patient-centered communication style in order to help people of low socioeconomic class communicate more effectively. The study concluded that further research is needed to understand the best ways for healthcare professionals to interact with patients from poor socioeconomic backgrounds. [24] examined healthcare communication: a narrative assessment of the literature and helpful suggestions. Findings showed that efficient and effective communication is essential in the healthcare industry and that written communication between specialized and primary care continues to be the most common mode of

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communication. The review included 69 articles in total, and the findings revealed that poor communication can have a variety of detrimental effects, including the interruption of care, compromises to patient safety, patient dissatisfaction, and the inefficient use of precious resources, including unnecessary investigations, physician work time, and financial repercussions. The study found that there is room for improvement in both the content and timeliness of written communication. It was suggested that graduate and postgraduate training should place more emphasis on communication between caregivers so that it becomes ingrained as a crucial skill and quality characteristic of each caregiver.

III. MATERIAL & METHODOLOGY

Area of Study: The University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt, Rivers State, Nigeria, served as the study's subject. The UPTH is located in Choba, an area of Rivers State, Nigeria's Obio/Akpor Local Government Area. The capital of Rivers State is Port Harcourt, which is recognized for the catchphrase "treasure base of the nation." One of the six states in Nigeria's South-South Geopolitical Zone is the state in question. There are 23 Local Government Areas in Rivers State, which was founded in 1967. The Atlantic Ocean borders Rivers State in the south, Bayelsa and Delta State in the west, Akwa Ibom State and the Imo River in the east, and Abia, Imo, and Anambra State in the north, respectively [25].

Research Design: The researchers adopted a descriptive survey design approach for this study. **Population:** One hundred (100) outpatients and one hundred and twenty-five (125) members of the health information management staff from the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria, made up the study's population. **Sampling Method**: The sample size of 96 health information management professionals and 81 outpatients with a 95% confidence level was chosen for this study. The method of sampling that was used was a multi-stage method. This set of employees was chosen because they may be held accountable for any errors in their practices and even face penalty. **The instrument for Data Collection:** The researchers employed a patient checklist as the second respondent and a self-made questionnaire for practitioners of health information management as the first respondent. **Data Collection Method**: The researchers conducted checklist interviews with patients while also personally distributing the research instrument to health information management professionals after receiving approval from the study institution administration and participants' consent to participate in the study. The acquired data were investigated using descriptive statistical techniques such as frequency and percentage tables. **Consider ethical issues:** This paper underwent a Turn-it-in plagiarism check to ensure that all facts and ideas were properly documented and referenced. Respondents were told that their responses would only be used for academic purposes, and the authority of UPTH and the administration were approached for consent and authorization to conduct the study. There were no competing interests in the inquiry, as well.

IV. RESULTS AND DISCUSSION

A total of 96 questionnaires were given out to the health information management practitioners; 86 of those were recovered, and 80 of them had been correctly completed, yielding a return rate of 83.3%; meanwhile, of the 81 questionnaires given to patients, 60 had been correctly completed and had been duly recovered, yielding a return rate of 74.1%. The analysis of the study was based on Figures 80 and 60 (140), which are shown in the tables below.

Section B: Research Questions

Research Question 1

What kinds of communication techniques do professionals in health information management utilize when they present at UPTH?

PART I for Patients

Table 2: **Health information management professionals' comments on the many kinds of communication strategies they employed in their UPTH performances**

S/N	Variables	Yes (%)	No (%)
1	In this institution, health information management professionals frequently interact with patients verbally.	45(75%)	15(25%)
2	Health information management professionals in this hospital always communicate with patients and providers in writing.	33(55%)	27(45%)
3	Every aspect of the health information management processes in this hospital always has a positive patient-provider interaction..	20(33.3%)	40(66.7%)
4	In this institution, health information management professionals are skilled at leveraging technology to facilitate communication with patients.	25(41.7%)	35(58.3%)
5	Health information management professionals frequently utilize symbols to explain facts to patients in this institution.	10(16.7%)	50(83.3%)
6	Practitioners of health information management always respond to patient complaints through formal communication processes.	45(75%)	15(25%)
	Total	**178(49.4%)**	**182(50.6%)**

Source: Researcher's field survey, 2022

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Table 2. showed that health information management practitioners frequently used verbal communication abilities, as shown by yes responses of 45 (75%) and 35 (55%) for written patient-provider communication; 45 (75%) Yes responses indicated that HIMPs frequently used formal procedures in carrying out their performances, while 40 (66.7%) No responses indicated that there was no good patient-provider relationship in any section of the health information management practice; 35 (58.3%) No responses indicated that HIMPs are not good at using technology to aid communication in attending to the patient; 50 (83.3%) No responses demonstrated that symbols are not frequently used to demonstrate facts to patients; and 45 (75%) No responses demonstrated that HIMPs are not good

PART II: for Health Information Management Practitioner

Research Question 2: What obstacles prevent health information management professionals from performing effectively at the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria?

Table 3: Obstacles to good communication skills of health information practitioners

S/N	Variables	Yes (%)	No (%)
6.	In this hospital, health information management practitioners' effective communication abilities are frequently hampered by a lack of enthusiasm.	80 (100%)	0(0%)
7.	Are Health Information Management Practitioners' effective communication skills hindered in their performances in UPTH by a lack of management support?	70 (87.5%)	10 (15.5%)
8.	Does a Health Information Management Practitioner's success in UPTH suffer from their incapacity to adapt to organizational policy changes?	60 (75%)	20 (25%)
9.	Do Health Information Management Practitioners' effective communication skills frequently inhibit them from performing well in UPTH due to a lack of educational advancement?	50 (62.5%)	30 (37.5%)
10.	Is the absence of the necessary infrastructure a hindrance to the performance of Health Information Management Practitioners in UPTH?	80 (100%)	0(0%)
11.	Health information management practitioners' effective communication skills are hampered by a lack of staff retraining in keeping with the current worldwide trend in their work at UPTH.	75(93.75%)	5(6.25%)
	Total	**340 (84%)**	**65(16%)**

Source: Researchers Field Survey, 2022

Table 3. demonstrated that replies from 80 (100%) Yes responders indicated a lack of motivation, and 70 (87.5%) Yes, 60 (75%), indicated a lack of management support. Yes, 50 (62.5%) respondents indicated that HIMP was unable to adapt to organizational policy change. Yes said that HIMPs' lack of educational development and 80 (100%) Yes noted that a lack of suitable infrastructure were obstacles to their ability to communicate effectively in their roles at UPTH, Rivers State, Nigeria.

Research Question 3: What can be done to help health information management professionals at the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria, communicate more effectively?

Table 4: Ways to improve good communication skills of health information Practitioners

S/N	Variables	Yes (%)	No (%)
12.	Can continuing education aid health information management professionals' performances in UPTH by enhancing their effective communication skills?	70 (87.5%)	10 (12.5%)
13.	Can the supply of proper infrastructure always result in the development of practitioners' effective communication abilities in their performances at UPTH?	60(75%)	20(25%)
14.	Do health information management practitioners' communication abilities improve as a result of staff motivation?	80 (100%)	0(0%)
15.	Can the personal growth of a health information management practitioner's communication abilities improve their job effectiveness in UPTH?	60(75%)	20(25%)
	Total	**270 (84.4%)**	**50 (15.6%)**

Source: Researchers Field Survey, 2022

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Table 4. indicated that respondents' responses of 70 (87.5%) agreed on continuing education, 60 (75%) agreed that adequate infrastructure should be provided, 80 (100%) agreed that motivation is important, and 60 (75%) agreed that personal development is one of the many ways to enhance the communication skills of health information management practitioners in their roles at the University of Port Harcourt Teaching Hospital, Rivers State, Nigeria.

Research Question 1: **What kinds of communication techniques do practitioners of health information management utilize in their UPTH performances?**
Inferred from Table 2's YES responses of 45 (75%), 33 (55%), and 45 (75%), HIMPs frequently employ verbal communication skills, patient-provider communication is always conducted in writing, and formal communication processes are used in their job performances. However, NO responses of 40 (66.7%), 35 (58.3%), and 50 (83.3%) respectively show that HIMP good patient-provider relationships are not seen in all practice areas, that technology is rarely used to aid communication, and that symbols were not frequently used to convey information to patients in the hospital. According to the total Yes 178 (49.4%) and No 182 (50.6%) responses, HIMPs do not possess strong communication skills that would improve their ability to conduct their jobs. These results concur with those of [21 & 6] who emphasized the importance of communication skills in the process of providing healthcare services (nursing), and they also showed that healthcare professionals (nurses) receive little to no formal training in effective patient and family communication. [4] claimed that in reality, effective and efficient health service delivery in medical facilities always combines verbal, written, visual, and nonverbal communication skills.

Research Question 2: What are the barriers to Good Communication Skills of Health Information Management Practitioners in their Performances at the University of Port Harcourt Teaching Hospital, Rivers State, Nigeria?
As barriers to HIMPs' performances in UPTH, Table 3 indicated that YES, 80(100%) lack of motivation, 70(87.5%) lack of management support, 60(75%) inability to adjust to organizational change of policy, 50(62.5%) lack of educational advancement for HIMPs, 80(100%) lack of appropriate infrastructure, and 75(93.75%) lack of staff retraining in line with global trend. Overall, there were 65 (16%) NO responses and 340 (84%) YES responses. These imply a lack of management support, a failure to adapt to organizational policy changes, a failure to grow educationally, and a failure to have the necessary infrastructure. This study concurs with [22 & 18]'s assertions. According to a study, the characteristics of healthcare workers and patients, a lack of motivation, and an inadequate infrastructure are the main obstacles to effective communication.

Research Question 3: What are the methods for enhancing the performance of health information management practitioners at the teaching hospital of the University of Port Harcourt in Rivers State?
As different ways to enhance the effective communication skills of health information management practitioners in their performances at the University of Port Harcourt Teaching Hospital, Rivers State, Nigeria, Table 4 showed that 70(87.5%) YES responses were given to continuing education, 60(75%) YES responses were given to the provision of appropriate infrastructure, 80(100%) YES responses were given to motivation, and 60(75%) YES responses were given to individual personal development. The study of [22, 7 & 21] included formal training in communication skills, personal development of healthcare practitioners' communication skills, and provision of adequate infrastructure to support the implementation of patient safety and delivery of high-quality healthcare services. These results are consistent with some of the findings and recommendations in that study.

V. CONCLUSION AND RECOMMENDATIONS

The provision of such services is made possible by staff members' effective communication skills, which they have learned and put to use in both normal and emergency/exigency instances. This is necessary for every organization to be competitive and to produce excellent output. Only when health information management professionals and other members of the medical and allied health disciplines function with proficiency and effective communication skills will patients and other stakeholders feel satisfied and be able to work as a cohesive team. Following are the recommendations made by the researchers in light of the main findings of this study.

1. The management of UPTH and the Heads of Departments and Unit heads/supervisors should exert all of their effort to ensure proper good provider-patient relationships for the delivery of high-quality healthcare services by engaging all stakeholders in discussion and teamwork when making decisions about healthcare delivery and any emergencies that may likely arise.
2. To address shortcomings caused by inadequate health information management owing to manual techniques, the management of UPTH and its supporting organs, including health partners, should always assure the provision and effective continuous use of technology aids in communication.
3. The management and staff of UPTH should exert more effort to improve verbal communication processes between healthcare providers and patients as well as among themselves, as the majority of patients lack adequate knowledge of how to use technological communication devices, and even poor network and epileptically power supply can make it impracticable to use such devices in communication while always keeping Nigerian in mind.

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4. The management of UPTH, the Federal Government through the Federal Ministry of Health, Healthcare Partner Agencies, and the Nigerian Health Records Officers Registration Board should work together and ensure the implementation of policies regarding sufficient motivation, institutional support, the availability of prerequisite infrastructure, and regular training and retraining of health information management practitioners on communication skills improvement as well as on the use of health information management software.

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EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

TIKTOK AS A SUPPLEMENTARY INSTRUCTIONAL MATERIAL IN TEACHING FILIPINO AND COMMUNICATION SUBJECTS

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ABSTRACT

*This study is entitled **"TIKTOK AS A SUPPLEMENTARY INSTRUCTIONAL MATERIAL IN TEACHING FILIPINO AND COMMUNICATION SUBJECTS."** This study aimed to determine the effectiveness of the TikTok application as an innovative supplementary instructional tool in teaching Filipino and Communication subjects to Secondary and Tertiary students in the academic year 2022-2023. The researcher utilized an experimental method to obtain the necessary data. Fifty (50) students participated as study respondents from the Southern Luzon State University-Main Campus and Laboratory School through Purposive Sampling Technique. Based on the data obtained, mental effectiveness, emotional effectiveness, and active learning are both very high. Therefore, the TikTok application effectively cultivated intellectual skills, self-esteem, active cultivation, and the application of knowledge gained by students.*

Regarding the outcome of the student's preliminary examination level, it was scored as quite satisfactory, while the final examination was scored as satisfactory. It affirms that there is a significant difference in their level of performance. Thus, the hypothesis "There is no significant difference in the performance level of the students based on the preliminary and final test" was not accepted. Therefore, there was a significant difference in the scores obtained by the students, and TikTok became effective as an innovative approach and strategy in teaching Filipino and Communication subjects.

The hypothesis "There is no significant relationship between the use of TikTok as an innovative supplementary instructional tool in teaching Filipino subjects and students' performance" was not accepted. Therefore, there is a significant relationship between them. The videos developed using TikTok for students was an effective innovative supplementary material in teaching Filipino and Communication subjects. Teachers were encouraged to discover and utilize more innovative tools such as TikTok that could increase student's engagement and their performance in their Filipino and Communication subjects. These techniques can contribute to developing a more conducive and fun learning process.

INTRODUCTION

Every generation has its characteristics that have a significant impact on human life. Many changes were happening in the field of education, even teaching methods and tools that serve as a big challenge that teachers face. Keeping students interested and motivated in a lesson was one challenge for education advocates. The discovery of different approaches to lesson delivery does not only end in the four corners of the classroom because the teachers are constantly working on it. With the development of the modern skills of students today, it was only appropriate that teaching methods go along with this change to make their learning more effective. It was good that their needs were being met simultaneously while imparting the knowledge that young people should know. The developed curriculum standards for Education for All (EFA) 2015 (Education For All, 2015) understood the content of each subject, such as Filipino and Communication. It ensured what was to be learned and the student's performance level so that expectations were high. It was challenging, so it was appropriate to use two appropriate approaches and strategies to cultivate the knowledge and skills of students to prepare them for earning a living if they could not continue in college. It also ensured that what students learned could be used in real life and would be part of national identity, cultural literacy, and continuous learning in keeping up with the rapid changes in the world. Since the curriculum was considered interactive, teachers were expected to launch activities allowing students to exercise their intellect or exchange ideas. That was why teachers continued to find and discover to meet the need in academia. In a time when there were many innovations caused by modern technology, the educational facilitator needed to be innovative, creative, and artistic to meet the challenge of effective learning and teaching success. Modern teaching and technological changes in the 21st century are today's schools' focus. It was of absolute benefit to students and teachers. Concepts were expanded more and more because students could see what the specific topic wanted to convey. The use of short videos was one of the methods that could be attributed to the technological change in the field of education today. It helped to maintain the student's interest in the lesson, develops the ability to independently, and can also be the basis for three future.

In this regard, in his article, Escober (2020) stated that the application of TikTok becomes a way for young people to meet the simple reality of life and the development of realistic content. This application emerged in 2016 and contained a variety

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of videos that continued to be enjoyed by many. As the number of young people enjoying the TikTok application grew, it became a big part of their lives where they expressed themselves more. It also became their platform for adapting to environmental change. Therefore, it could influence different aspects of their lifestyle. One of them was the field of cultivation and learning which was a significant factor for them as individuals. In this situation, this research wanted to know the effectiveness of the TikTok application as a modern approach and strategy in teaching Filipino subjects. The researcher sought its timeliness and relevance to the everyday occurrences in the students' lives. After all, many students enjoyed TikTok, and over time the teaching methods keep students' knowledge cultivation alive and meaningful.

RESEARCH OBJECTIVES

This study aimed to determine the effectiveness of the TikTok application as an innovative supplementary material in teaching Filipino and Communication subjects. This study sought to answer the following questions:

1. What is the level of use of TikTok as an innovative supplementary material in teaching Filipino and Communication subjects based on:
    1.1 Mental Capacity;
    1.2 Valid Perception; and
    1.3 Effectiveness in Active Learning
2. What is the performance level of students in the Filipino and Communication subject based on the pre-test and post-test?
3. Is there a significant difference in the level of performance of the students based on their pre-test and post-test?
4. Does the use of TikTok as an innovative supplementary material in teaching Filipino and Communication subjects have a significant relationship with student performance?

HYPOTHESIS

1. There is no significant difference in the performance level of the students based on their pre-test and post-test.
2. There is no significant relationship between the use of TikTok as an innovative supplementary material in teaching Filipino and Communication subjects to student performance.

METHODOLOGY

This chapter presented the research design, respondent, method, instrument, and statistical method.

RESEARCH DESIGN

This study employed an experimental research design to identify significant influences in concluding whether the Tiktok application is an effective supplementary material in teaching Filipino and Communication subjects.

RESPONDENTS

Forty (40) Southern Luzon State University Main Campus and Laboratory Schools students willingly participated in the research study through purposive sampling.

RESEARCH METHOD

The researchers aimed to utilize the TikTok application as an innovative supplementary material in teaching Filipino and Communication subjects. Thus, the researchers formulated a self-made questionnaire, and pre-tests and post-tests, as instruments for identifying the effectiveness of Tiktok in student learning. As the questionnaire was developed, it was reviewed and validated by field experts: the panelists and teachers handling Filipino and Communication subjects. Thus, consent forms, questionnaires, and pre-and post-tests have been prepared to be administered for data gathering through google forms. The pre-and post-test results were also compared, correlated with appropriate statistics, analyzed, and interpreted.

RESEARCH INSTRUMENT

The researchers developed TikTok videos containing lessons about Filipino and Communication as supplementary learning material in class. In developing the questionnaire, the researchers based the learning skills related to and should be acquired by students in the subject of Filipino and Communication at secondary and tertiary levels. This questionnaire, comprised of thirty (30) statements, served as a survey regarding the level of proficiency of the TikTok application based on their mental, emotional, and active learning effectiveness. The pre-test and post-test measured the student's knowledge, containing thirty (30) items. The weight of competent points for the answer in this part is as follows:

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4.50 - 5.00	Strongly Agree (SA)
3. 51 - 4.50	Agree (A)
2. 51 - 3.50	Moderately Agree (MA)
1.51 - 2.50	Disagree – Agree (A)
1.00 - 1.50	Strongly Disagree (SD)

STATISTICAL DESIGN

The researchers used statistical methods to provide an appropriate and clear analysis, forecast, and interpretation of the collected data. In determining the result of the level of use of TikTok as an innovative supplementary material in Filipino and Communication subjects and the level of performance of students in Filipino and Communication subjects based on their pre-and post-test, researchers used a *weighted mean* and *standard deviation*.

Mean and *T-tests* were used to measure the significant difference in the student's level of performance based on their pre- and post-test, while *r-value* and *p-value* were used to measure the significant relationship between the use of TikTok as a modern teaching aid in Filipino and Communication subjects with the student's performance.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The study aimed to determine the effectiveness of TikTok as a supplementary material in teaching Filipino and Communication subjects among selected students at Southern Luzon State University in the 2022-2023 academic year. An experimental method was utilized with fifty (50) SLSU students who willingly participated in the study through purposive sampling. The method used by the researchers was very helpful in analyzing and analyzing the effectiveness caused by the TikTok application.

Based on the data collected, in the level of use of TikTok as a supplementary material in Filipino and Communication subjects based on mental effectiveness, the result was *"Strongly Agree"* with a literal explanation *"Very High"*. In the level of use of TikTok as a supplementary material in Filipino and Communication subjects based on the effectiveness of emotions, the result was *"Strongly Agree"* with a literal explanation *"Very High."* In the level of use of TikTok as a supplementary material in Filipino and Communication subjects based on the effectiveness of active learning, the result was *"Strongly Agree"* with a literal explanation *"Very High."*

Based on the pre-test, the performance level of the students in Filipino and Communication subjects revealed a literal explanation *"Moderately Good."* Meanwhile, based on the post-test, the performance level of the students in Filipino and Communication subjects revealed a literal explanation *"Excellent."* As the mean differences, t-values, p-values, and comments were taken, it was shown that there is a significant difference in the performance level of the students based on their pre-and post-tests. Therefore, the null hypothesis that "There is no significant difference in the level of performance of students based on the preliminary and final examination" was not accepted. Thus, the results revealed that there is a significant relationship between the use of TikTok as a supplementary material in teaching Filipino and Communication subjects with students' performance. Therefore, the null hypothesis that "There is no significant relationship between the use of TikTok as a modern teaching aid for the Filipino subject and the students' performance" was not accepted.

Recommendations

After studying and analyzing the results, the researcher suggested the following recommendations:

1. In addition to cognitive effectiveness, emotional effectiveness, and active learning, teachers can discover other aspects to focus on in determining the effectiveness of an auxiliary teaching tool to increase the level of education.
2. Due to the positive outcome of the study, the developed videos can be used as innovative teaching aids for Filipino and Communication subjects at Southern Luzon State University.
3. Having a significant difference in the performance level of the students, the videos generated in TikTok can be subject to revision by additional information regarding the topic, and apply different effects that will pique the student's interest and enhance the performance level in Filipino and Communication subjects.
4. Teachers are encouraged to discover more innovative tools, such as the use of TikTok that students are currently interested in, to increase performance in Filipino and Communication. These techniques can contribute to developing a more conducive and fun learning process.

Conclusions

Through the presented results, the following conclusions were formed.

1. The null hypothesis *"There is no significant difference in students' level of performance based on the pre-and post-tests"* was not accepted. Therefore, there was a significant difference in the scores obtained by the students. This meant that TikTok has is an effective innovative supplementary material in teaching Filipino and Communication subjects.
2. The null hypothesis *"There is no significant relationship between the use of TikTok as an innovative supplementary teaching material in Filipino and Communication subjects on student performance"* was not accepted. Therefore, there is a significant relationship between them. It indicated that the relevance in the use of Tiktok as an innovative teaching tool is effective.

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TABLES

Table 1. Level of use of TikTok as an innovative teaching aid in the subject of Filipino and Communication based on Cognitive Efficacy

Statement	Mean	SD	Feedback
Helpful in increasing the level of knowledge and learned competence.	4.56	0.67	**Strongly Agree**
The lessons taught in Filipino and Communication subjects are easily processed.	4.56	0.58	**Strongly Agree**
Significant meanings, meanings, and ideas of the subject are better remembered.	4.50	0.61	**Strongly Agree**
The TikTok application is easy to use in meeting the needs of students in relation to the understanding of different texts.	4.46	0.79	**Strongly Agree**
It is helpful to translate new knowledge or skills in real life situations.	4.40	0.73	**Strongly Agree**
The development of critical thinking and creative practice is cultivated.	4.46	0.71	**Strongly Agree**
The analysis of the subject is strengthened.	4.40	0.67	**Strongly Agree**
Expands imagination while watching video related to the topic.	4.52	0.58	**Strongly Agree**
Relate previous knowledge to new information more quickly.	4.58	0.57	**Strongly Agree**
Brings meaningful evaluation about the subject.	4.46	0.65	**Strongly Agree**
Overall Mean: *4.49* Standard Deviation: *0.656* Literal explanation: Very High			

Signs:

Metric Range	Comment	Literal explanation
4.20-5.00	Strongly Agree	Very high
3.40-4.19	Fairly Agree	High
2.60-3.39	Agree	Fairly high
1.80-2.59	Fairly Disagree	Low
1.00-1.79	Strongly Disagree	Very low

Table 2. Level of use of TikTok as an innovative teaching aid in the subject of Filipino and Communication based on Emotional Effectiveness

Statement	Mean	SD	Puna
Enriching the learned skill increases motivation and emotional intensity.	4.44	0.64	**Strongly Agree**
Helps to ease the learning method.	4.48	0.71	**Strongly Agree**
Brings comfort to the learning process.	4.58	0.61	**Strongly Agree**
The video grabs attention viewed in the application related to the subject.	4.64	0.60	**Strongly Agree**
The subjects are more valued included in the lesson.	4.54	0.54	**Strongly Agree**
There is pleasure in receiving informational parts of learning.	4.44	0.64	**Strongly Agree**
Brings opportunity to be more organized in the time spent studying.	4.58	0.61	**Strongly Agree**
More freely follows the related lesson instructions.	4.52	0.71	**Strongly Agree**
The mind becomes more open to the changes taking place in the learning process in the present time.	4.46	0.76	**Strongly Agree**
Watching and listening skills are developed as part of learning.	4.56	0.64	**Strongly Agree**
Overall Mean: *4.52* Standard Deviation: *0.647* Literal explanation: *Very High*			

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Signs:

Metric Range	Comment	Literal explanation
4.20-5.00	Strongly Agree	Very high
3.40-4.19	Fairly Agree	High
2.60-3.39	Agree	Fairly high
1.80-2.59	Fairly Disagree	Low
1.00-1.79	Strongly Disagree	Very low

Table 3. Level of use of TikTok as an innovative teaching tool for Filipino and Communication subjects based on Effectiveness in Active Learning

Statement	Mean	SD	Puna
Acquired competencies are enhanced.	4.52	0.65	**Strongly Agree**
Independent learning skills are developed.	4.48	0.68	**Strongly Agree**
Responds promptly and constructively to assessments and evaluations.	4.50	0.61	**Strongly Agree**
Writing skills are developed through videos related to the lesson.	4.44	0.67	**Strongly Agree**
It is easier to analyze different texts towards research.	4.52	0.68	**Strongly Agree**
The knowledge gained from the lesson is better applied to the reality of life.	4.42	0.67	**Strongly Agree**
The integration of technology and lessons is developed towards faster understanding of the subject.	4.60	0.67	**Strongly Agree**
Generates meaningful reflection or reflection about the lesson after watching the video.	4.54	0.65	**Strongly Agree**
Experimental and practical training related to the lesson is cultivated.	4.54	0.61	**Strongly Agree**
Bringing an opportunity to further develop the ability to share acquired knowledge with fellow students.	4.58	0.57	**Strongly Agree**
Overall Mean: *4.51* Standard Deviation: *0.644* Literal explanation: *Very high*			

Signs:

Metric Range	Comment	Literal explanation
4.20-5.00	Strongly Agree	Very high
3.40-4.19	Fairly Agree	High
2.60-3.39	Agree	Fairly high
1.80-2.59	Fairly Disagree	Low
1.00-1.79	Strongly Disagree	Very low

Table 4. Performance level of students in the subject of Filipino and Communication based on the Pre-test

Scores	Component	Percentage	Literal Description
29 - 30	0	0.00	**Best**
26 - 28	1	2.00	**More Efficient**
20 - 25	19	38.00	**Excellent**
17 - 19	17	34.00	**Moderately Good**
5 - 16	13	26.00	**Poor**
2 - 4	0	0.00	**Not Very Good**
0 - 1	0	0.00	**Non-Excellent**
Total	**50**	**100**	
Weighted Mean	***19.18***		
Lowest Score	***11***		**Moderately Good**
Highest Score	***26***		
Standard Deviation	***3.921***		

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Signs:

Metric	Literal Explanation
96% - 100%	Best
86% - 95%	More Efficient
66% - 85%	Excellent
55% - 65%	Moderately Good
15% - 54%	Poor
5% - 14%	Not Very Good
0 - 4%	Non-Excellent

Table 5. Level of Performance of the students in Filipino and Communication subjects based on the Post-Test

Scores	Component	Percentage	Literal Description
29 - 30	1	2.00	**Best**
26 - 28	11	22.00	**More Efficient**
20 - 25	28	56.00	**Excellent**
17 - 19	7	14.00	**Moderately Good**
5 - 16	3	6.00	**Poor**
2 - 4	0	0.00	**Not Very Good**
0 - 1	0	0.00	**Non-Excellent**
Total	**50**	**100**	
Weighted Mean	***22.58***		**Best**
Lowest Score	***12***		
Highest Score	***29***		
Standard Deviation	***3.581***		

Signs:

Metric	Literal Explanation
96% - 100%	Best
86% - 95%	More Efficient
66% - 85%	Excellent
55% - 65%	Moderately Good
15% - 54%	Poor
5% - 14%	Not Very Good
0 - 4%	Non-Excellent

Table 6. Significant difference in Students' Performance Level based on the Pre- and Post-tests

Test	Mean	Computed t-value	Critical t-value	p-value	Analysis
Pre-test	19.18	4.5947	1.6609	0.0000	**Significant**
Post-test	22.58				

Table 7. Significant relationship of the use of TikTok as a supplementary material in teaching Filipino and Communication subjects with Students' Performance

Strategy in Teaching	Relation	r-value	Evidence of Relationship	Analysis
Cognitive	Performance	0.1957	Very Low Correlation	**Significant**
Affective		0.2531	Low Correlation	**Significant**
Active Learning		0.1557	Very Low Correlation	**Significant**

Signs:

Metric Evidence of Relationship	
±0.00	No Correlation, No Relationship
±0.01 − ±0.20	Very Low Correlation, Virtually No Correlation
±0.21 − ±0.40	Low Correlation, Certain but Superficial Relationship
±0.41 − ±0.70	Moderate Correlation, Relationship Significant
±0.71 − ±0.90	High Correlation, Critical Relationship
±0.91 − ±0.99	Very High Correlation, Believable Relationship
±1.00	Highly Correlated, Fully Correlated

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

ACTIVITY OF ENGINEERING AND HYDROTECHNICAL STAFF FROM CENTRAL FERGHANA PROVINCE AND THEIR PARTICIPATION IN IRRIGATION WORKS OF FOREIGN COUNTRIES

(50-80 Years of 20th Century)

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Article DOI: https://doi.org/10.36713/epra12283
DOI No: 10.36713/epra12283

ABSTRACT
In the article, the activities of hydraulic engineers who came from the Central Ferghana regions in the 1950s and 1980s and their participation in the irrigation works of foreign countries were analyzed with the help of scientific literature and primary sources.
KEY WORDS: *Irrigation system, Central Ferghana, irrigation personnel, Mozambique, Afghanistan, jalalabad complex.*

INTRODUCTION

It is worth noting that Uzbek irrigators have extensive experience in the construction of hydrostructures, reconstruction works, and the opening of reserves. This age-old tradition continued organically during the 1960s and 1980s of Soviet rule. It was during this period that Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (now "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University) and Andizhan cotton-growing institutes (now Andizhan Institute of Agriculture and Agro-Technology) trained personnel of hydraulic engineers and mechanizers according to international standards. For example, from the 60s of the 20th century, Uzbek engineers-hydraulic technicians with mature experience in the field of irrigation participated in the construction of hydro facilities in Mozambique, Afghanistan, and Syria, where the irrigation system was in a simple state. Among them, representatives of Central Fergana regions in Afghanistan (T. Khojiboev, A. Otaboev, Y. Rahmonov, S. Gafurov), Mozambique (U. Nizomov, D. Koldoshev) and Syria (A. Razzakov, S. Yakubbekov, D. Karimov, S.Samsakov) worked.

RESEARCH METHODS

The Ministry of Water Management of the Republic, which has mature experience in the field of irrigation construction, and the "Sredazgiprovodkhlopok" project institute provided support for the construction of the Jalalabad irrigation canal on the Kabul River. The use of the canal and hydroelectric station began in 1963 [1]. About 600 Soviet specialists, including 260 representatives of Uzbekistan, participated in the construction of the Jalalabad complex here. In particular, the chief specialist was A.F. Michurin (Ferghana region), a hydraulic engineer who worked on the construction of the Big Ferghana Canal and Ortatokai reservoirs, and S. Gafurov, a hydraulic engineer (Ferghana region).

RESULTS AND DISCUSSIONS

The construction of Jalalabad highway canal and hydro facilities was carried out with the participation of specialists from the republic and Ferghana Valley. Specialists of the Ministry of Reclamation and Water Management of the Republic provided technical and advisory support to construction organizations and irrigation construction works here. For example, in 1961-1965, they took an active part in the works on irrigated fields, which were established in place of 26,000 hectares of protected land in the Jalalabad system, including 6,000 hectares using a mechanical water-producing (lifting) structure [2].

In 1964-1965, more than 74,000 ha of irrigated land was planted with cotton as a result of the participation of representatives of the valley in irrigation works in the Afghan lands. In these years, the total yield of cotton was 75 thousand tons, and the average yield was 10 tons per ha. was from [3]. In 1965, the water consumption was 50 m³/s, the Jalalabad irrigation system, which included a 70 km main irrigation channel and other hydrotechnical facilities, was built and put into permanent use

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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[4]. The activities carried out in cooperation, in turn, gave an opportunity to release water to 25,000 hectares of land that were previously flooded. Large mechanized state farms were built on newly opened lands. They specialized in growing citrus, olives, meat and dairy products.

It was in 1965 that such farms as "Khadda", "Jumhuriyat", "Batikot", "Ghaziabad" were launched in the city of Jalalabad, the center of Nankhargar region of Afghanistan. T. Hojiboev, A. Otaboev and Y. Rahmonov from Andijan hydraulic engineers took part in the re-appropriation of existing 2,200 ha of rocky land in the "Jumhuriyat" farm and putting it into use. Olives and turnips were mainly cultivated in the occupied territories. It is worth noting that the maximum weight of cultivated turnip in this area is 5-7 kg. organized the In addition, 31,500 hectares of land were planted with the Jalalabad irrigation system, the length of the main canal is 70 km, hydroelectric power station is included, that is, this system was of complex interest. As a result of farm development in Afghanistan, 200,000 hectares of reserves were opened, 150,000 hectares of irrigated areas were improved. Water from Amudarya, Panj, Kokcha, Kunduz rivers was used for irrigation [5]. Irrigation facility built with the participation of Uzbek-Afghan irrigators - 164 mln. in Ghazna region. Sarde is a reservoir with a volume of m^3. His project was prepared at the "Sredazgiprovodkhlopok" institute. A modern irrigation system was built at the base of this artificial basin. In turn, the irrigation system improved the water supply of 17,600 newly opened areas, including 1,000 of existing irrigated lands. At the same time, important measures were taken to organize the regular use of irrigated areas in the main objects of the irrigation network, and more state farms were established there. Training of local specialists was also started through individual training in workplaces belonging to irrigation departments. In particular, when the construction of the Sarde reservoir on the Jilga river began, 1150 construction and agricultural workers, 569 mechanics, and 80 engineering and technical workers were trained. Trained specialists helped with the irrigation work here.

During the studied period, hydraulic engineers from Andijan region took part in the development of the West-Maskene desert in Syria, which is equal to 50,000. 26 state farms have been effective in developing this desert. Also, valley engineers took part in exploitation and development work in Mezerepane state farm located in Nampulo province of the Republic of Mozambique. A group of specialists [6] worked effectively in the construction, full operation and repair of Namioza reservoir (barrage-small reservoir) (capacity 1 million 200 m^3) and Impiezi reservoirs (capacity 1 million m^3). With the help of Fergana Valley hydraulic engineers, the commissioning and renovation of a number of water facilities in these republics, as well as the development of rocky lands, gave impetus to the development of cotton cultivation in these areas.

However, with the development of international relations and experiences in the field of irrigation, the need for personnel in some regions of Central Ferghana became obvious. This need for personnel was also observed in the Boz region of Central Ferghana. In particular, there was a lack of specialist hydraulic technicians, engineers, and engineers in the regional water management organizations. In 1965, 64 employees worked in the district water industry, but most of them did not correspond to the positions they held, and the number of such employees was 32 people. Therefore, the regional executive committee asked the regional governing bodies to assist in sending the graduates of the hydromelioration school to Boz [7]. However, this demand was not met in time, because the demands and requests of the regional authorities were learned from the center and decided only later. It goes without saying that this process took a lot of time.

Even in the 1970-1980s, the leading bodies of the Soviet government paid great attention to the personnel training system for the middle-level sector in the republic. Because of this, their number increased. It was during the ninth five-year period (1971-1975) that 6 hydromelioration technical schools trained water management personnel. In particular, Tashkent, Samarkand, Andizhan, Urganch, Surkhondarya and Nukus hydromelioration technical schools have been operating. These educational institutions trained 8,496 specialists in hydromelioration, hydrotechnical construction, mechanization of hydromelioration works, and automatic operation of irrigation systems. It can be said that they increased every year, in short, in 1971 - 1349, in 1972 - 1558, in 1973 - 1981, in 1974 - 1790, and in 1975 - 1818 young specialists with secondary technical education were trained [8] . During this five-year period, the training of middle-level specialists was carried out mainly in the Andijan region of Central Ferghana. This educational institution plays the role of a center for the training of secondary specialists in the region. It is clear from the given data that the training of middle-level and higher-educated technical personnel related to the field of irrigation has grown in the republic, and in addition, in the Fergana Valley. However, in some areas of the republic, in particular, in Central Ferghana, the process of shortage of personnel in the field of irrigation and melioration was clearly visible. It is worth noting that the lack of specialists with diplomas (especially in newly acquired lands) was considered a serious problem. The authorities and the heads of most agricultural enterprises were not engaged in creating favorable conditions for specialists to work permanently. Young professionals who graduated from universities and technical schools and were sent to villages were not provided with enough housing, they often did not work in their specialty [9]. In terms of personnel, the only factor that led to such a situation was that only the center was empowered to appoint and dismiss heads of irrigation departments. Also, most agencies and organizations were deprived of the right to conduct independent work. They expected approval from the top of annual plans for defining and implementing agrarian and irrigation measures and were accustomed to working only on the basis of orders.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Many collective farms and state farms played an incomparable role in the development of the cotton industry in the regions of the Ferghana Valley. A number of collective farms and state farms were formed in the appropriated territories. Under the influence of Soviet agrarian practices, the number of such farms increased. These farms were filled with specialists with higher, secondary specialized education related to irrigation and agrarian fields. For example, in 1972, there were 187,800 specialists in various professions in the valley collective farms and state farms, and 7,930 of them were agronomists, zootechnicians, irrigators and other personnel. In particular, there were 1,258,000 specialists with special secondary education [10]. These specialist personnel, in turn, took part in the opening of new lands here and the creation of cotton fields in them. In 1973, the Andizhan hydromelioration technical school, which was considered a middle-level personnel training center for the Central Ferghana irrigation network, mainly trained personnel in the fields of "Hydromelioration", "Hydrotechnical construction", "Mechanization of hydromelioration works". According to the tariff notice dated April 15, 1984, 73 teachers worked in the technical school, 57 of them were full-time, 16 were part-time. Admittedly, the capital funds allocated to construction works in the field of irrigation were not fully utilized, and therefore, in most cases, these activities were stopped before completion. The reason for this is that the Soviet authorities were not aware of the natural possibilities of the valley and the development of unpromising plans for the development of the area.

CONCLUSION

In 50-80 of 20th century the issue of training specialists for the irrigation of the Ferghana Valley was a constant focus of the former government. Because irrigation works were primarily directed to the development of cotton cultivation. For this purpose, a number of activities were developed by the agencies in the field and an effort was made to implement them in the studied period. In the valley, specialists with higher education related to the system were mainly trained at the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers and Andizhan cotton-growing institutes, and middle-level personnel were mainly trained at hydromelioration technical schools and mechanization schools. In particular, since 1956, hydraulic engineers, land reclamation engineers, mechanizers have been trained in the institute in accordance with international standards, and it plays a key role, and its international reputation has been increasing year by year. In the management positions of the central Fergana irrigation system, not the representatives of the local population who well understood the natural conditions of this land, but mostly people belonging to other nationalities worked. Admittedly, during the studied period, professional and experienced hydrotechnical engineers of international standards came from the republic, including the Ferghana Valley, and they actively participated not only in the irrigation system of the valley, but also in the irrigation and development activities held in foreign countries, including the country of Mozambique.

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EPRA International Journal of Research and Development (IJRD)
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A STUDY TO ASSESS THE KNOWLEDGE REGARDING PERSONAL HYGIENE AMONG THE PRIMARY SCHOOL CHILDREN IN A SELECTED GOVERNMENT SCHOOL AT ANDIPALAYAM, COIMBATORE

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ABSTRACT

STATEMENT OF THE PROBLEM

"A study to assess the level of knowledge regarding personal hygiene among primary school children in selected Government Primary School, Andipalayam, Coimbatore."

OBJECTIVES

- *To assess the level of knowledge regarding personal hygiene among primary school children.*
- *To find the association between the level of knowledge regarding personal hygiene among primary school children in selected demographic variables.*
- *To prepare the health education pamphlets to the children.*

RESEARCH DESIGN AND METHOD

A non-experimental research design was carried to find the knowledge regarding personal hygiene among primary school children studying in government primary school, Andipalayam. Checklist was prepared. Before collecting the data connect was obtained from each sample. Analysis was planned to be done by using descriptive statistics.

RESULTS

Regarding age of the sample, the age out of the 60 samples, 23(38.3%) of the children are age between 5-7 years and 37 (61.75%) of children are at the age between 8-10 years. Regarding standards of the children, 6 (10%) children are first standard, 14 (23.3%) children are second standard, 14 (23.3%) of children are third standard, 15 (25%) of children are fourth standard and 11 (13.3%) of children are fifth standard. Regarding the education of the father, 11(18.3%) of children father are illiterate, 27(45%) of children fathers are primary education,21(35%) of children fathers are secondary education and 1.7% children father are graduated. According to the education of the mother, 30 (5o%) children mothers are primary education, 20 (33.3%) children mothers are secondary education, 8 (13.3%) children mothers are illiterate, and 2(3.3%) children mothers are graduated. Regarding the occupation of the father, 41 (68.3%) children fathers are private employee and 2 (3.3%) children fathers are Government employee. According to the occupation of mother 23 (38.3%) children mothers are unemployment, 18(30%) children mothers are coolie, 10 (16.7%) children mothers are private employee and 9 (15%) children mothers are the government employee.

According to the family monthly income 26 (43.3%) children family monthly income are Rs.3001-6000 and 26 (43.3%) children family monthly income are 6001-10000 and 8 (13.3%) children family monthly income are above Rs.10001. Regarding the religion the maximum 57 (95%) children are Hindus and 3(5%) children are Christians. According to the living area maximum 50 (83.3%) children are comes from rural and 10 (16.7%) children are comes from urban. Regarding the type of house 47(78.3%) children are pucca house, 9(15%) children are kacha house and 4 (6.7%) children are thatched house. According to the water facility 56(93.3%) children are having Municipality water facility and 4 (6.7%) children are having pump set water facility. Regarding the source of information about personal hygiene maximum 39(65%) children are from parents, 14 (23.3%) children are from mass media and from mass media and 7(11.7%) children are from health workers.

The study revealed that 40 (66.7%) of school age have adequate knowledge, 14 (23.3%) of the school age have moderate knowledge and 6 (10%) of school age have inadequate knowledge on personal hygiene.

CONCLUSION

It is essential to conduct on more activities teaching modalities to enable the clients to participate in their lifestyle and also this study can be useful for health for health personnel to improve their knowledge and practice among primary school children.

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INTRODUCTION

Personal hygiene is a public health tool that is used for the disease prevention and health promotion in individual, families and communities.

Cleanliness in individuals in communities can reduce threats especially by community population health analysis. The focus of the good personal hygiene is to prevent disease, injuries and other health conditions through surveillance and the promotion of healthy behaviour in aspects relevant human health. It may prevent health problem from happening or re-occurring by implication education programme developing policies, administering services and conducting research.

Good personal hygiene now forms part of health primary health prevention strategy. This has been found to be effective by reducing mortality and morbidity rate in children.

One important tool that could be used to reduce child mortality from communicable disease may be health education especially to pupil in primary school

Personal hygiene, which is also referred to as personal care include following bathing hair, nail, feet, genital, dental cares and washing of cloths among others. Grooming is caring for finger nails and hairs, examples of these activities would be barbing of hairs and trimming of finger nails.

Basic hygiene refers to practices that help to maintain health prevent the spread if disease. It involves regular washing of body, washing of the body, washing hands when necessary, cutting of nails, washing ones clothing, keeping the hair neat and brushing of teeth. School children are particularly vulnerable to neglect of basic personal hygiene.

-Enahoro and Orokj. 1986

Hygiene is a set of practices performed for the preservation of health.

Hygiene refers to condition and practices that help to maintain health and prevent the spread of disease. – (WHO)

The consequences in term of morbidity and mortality are also more severe in then compared to adults. The increased burden of communicable discuses among school children due to poor hygienic practice and inadequate sanitary conditions remains concern on the public health agenda in developing countries. Poor knowledge, practice and attitude towards personal hygiene play major roles in the high incidence of communicable diseases and there for has negative consequence for the child's long term over all development.

Personal hygiene refers to comprehensive cleaning and caring for your body, maintain good personal hygiene including bathing, brushing your teeth, washing your hands, and wearing cleaning cloths. It is also included making safe and healthy decisions. When interacting with others implementing good a personal hygiene practice have both health and social benefits. (Alison Datko -2014).

Personal hygiene is essential for reason health, culture, and style, without a healthy level of tidiness, the body response through disease of skin, Also man is a social animal One risks his acceptance in society if his appearance is unkempt and his body unclean.

These are certain easy and day to day routine. Which when in corporate help to improve the state of one's personal cleanliness.

For most people good hygiene is so much a part of their daily routines that they think little about it. They bathe they brush their teeth, visit the dentist, for regular check-up and wash their hands, when preparing or eating food and handling unsanitary items. To keep those you care about healthy and safe help them learn and area sure that they are practicing good personal hygiene.

The fingers may get contaminated with one's own feces either directly or indirectly. Activities during defecation and child bottom washing are additional opportunities for the contamination of the fingers that facilitate the transmission of infection.

The cleanliness of our hands is very important in all our daily activities. In our normal activities our hands frequently get dirty. There are many situations in which micro-organism are likely to attach to our hands along with the dirt. Hand hygiene play a critically important role in preventing this transmission.

Common childhood infection like childhood diarrhoea, respiratory illness and bacterial skin infection can be averted by simple hand washing soap before and after using toilet. Children tend to tease a child who picks her nose or comes to school with matted hair, dirty clothing or a foul smell.

According to Australian psychologist Marion Kostanski, teasing is strongly related to a child's self-esteem, and our society has a low tolerance for individuals who look an act differently. The psychologist's study suggest a child who does not practice good personal hygiene is placed at risk for injurious teasing by peers. Take time to teach your child at young age the basics of good hygiene to avoid unnecessary teasing and taunting peers.

The personal hygiene habits developed by child can be taught in a fun way. Making up of games to if child can remembers what steps are needed to accomplish a specific hygiene goal. Using creativity will help child maintain an interest in personal hygiene. Pamphlets to use to motivate the child. The care must be there for not to make personal hygiene too much work for child. Keep it light and fan as child transition into owning these habits for a life time. Consistency in good hygiene can help the child establish healthy habit for a life time.

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STATEMENT OF THE PROBLEM

A study to assess the knowledge regarding personal hygiene among primary school children in a selected Government Primary School in Kilinjalmedu, Karailkal.

OBJECTIVES

- To assess the level of knowledge regarding personal hygiene among Primary School Children.
- To find the association between the level of knowledge regarding Personal Hygiene among primary school children in selected demographic variables.
- To prepare the health education pamphlets to the children.

OPERATIONAL DEFINITION

ASSESS

Refers to situational process of making judgement over the knowledge on personal hygiene among the Primary School Children observed from the scores based on checklist.

KNOWLEDGE

Knowledge refers to level of understanding of primary school children on personal hygiene.

PRIMARY SCHOOL CHILDREN

Primary school children refer to the children of 1stto 5th standard in the age group of 6-10 years respectively.

PERSONAL HYGIENE

It refers to the condition and practices that helps to maintain health and prevention of spread of disease.

-World Health Organisation.

RESEARCH METHODOLOGY

Research methodology involves systematic procedure in which the researcher start from initial identification of problem to its final conclusion the role of methodology consist of procedure and techniques for conducting a study.

This Chapter deals with the researcher design research approach, setting, population ,sample size criteria for sample selection and sampling techniques, description of scoring reliability and validity, data collection process and plan for data analysis.

RESEARCH APPROACH

It involve the description of the plan to investigate the phenomenon under study in a structured (quantitative), unstructured (quantitative) or a combined of the two methods.

-Suresh K Sharma (2011)

For the present study quantitative approach has been selected.

RESEARCH DESIGN

Research design is the master plan specifying the methods and procedure for collecting and analyzing the needed information in a research study

-Suresh K Sharma

For the current study non-experimental design was selected.

VARIABLES

Independent variable:

Personal hygiene among school children.

Dependent variable:

Knowledge regarding personal hygiene.

SETTING OF THE STUDY

Setting is the physical location and condition in which data collection takes place.

-Polit and Beck (2013)

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The study was carried out in government primary school situated in Andipalayam. This school consists of classes from 1st standard in Tamil medium. It is headed by a head master.

POPULATION

Population is a complete set of element (person or object) that possess some common characteristic defined by the sampling criteria establishment by the researcher.

-Polit and Beck(2013)

Target population: Means the entire group of people or object to which the researcher whishes to generalize the study finding.
In this study target population comprise of primary school aged between 5-10 years.

SAMPLING

Sample: Sample is the subset of population selected to participate in a study.

-BT Basavanthappa.

The sample for the present study was student studying in government primary school Andipalayam, were selected to participated in this study.

SAMPLE SIZE

The sample size comprised of 60 school students, Government primary school, Andipalayam.

SAMPLING TECHNIQUE

Sampling is the process of selecting a subset of population in order to obtain information regarding a phenomenon in way that represents the entire population.

-BT Basvanthappa(2014)

Convenient sampling technique was used to select the sample for the present study. During Data collection period to school children studying from 3rd to 5th standard in government primary school, Andipalayam were selected.

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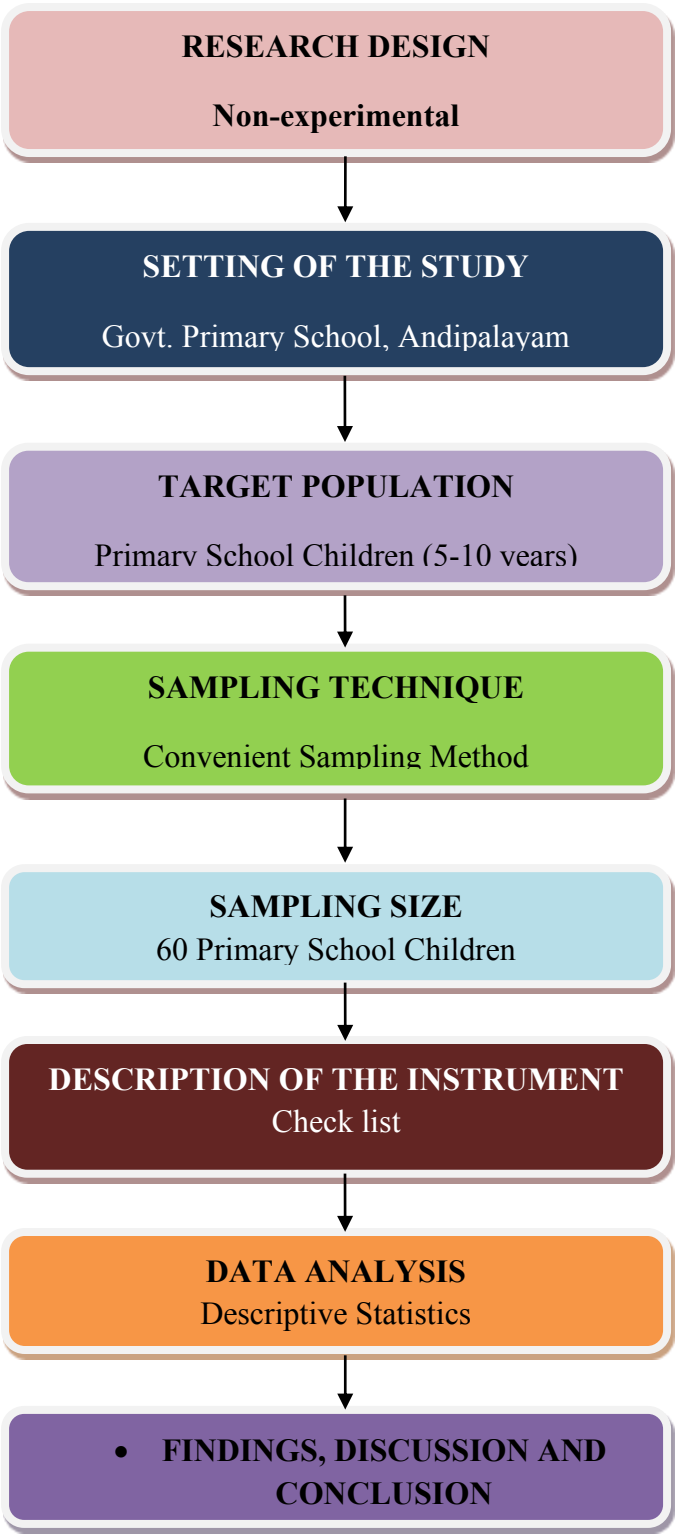
Fig.3.1 SCHEMATIC REPRESENTATION OF RESEARCH DESIGN



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SELECTION CRITERIA

The samples were selected based on following criteria

- Children between the age group of 5-10 years.
- Children present at the time of study.
-

DEVELOPMENT OF DATA COLLETION INSTRUMENT

The steps includes in the preparation of tool,

- Review of literature
- Preparation of blue print
- Consultation with expert
- Final draft
- Editing the tool

REVIEW OF RELATED LITERATURE

Consultation with guide and referring related books, journals, thesis, articles and reports was done to prepare the tool.

DESCRIPTION OF TOOLS

Tools consist of two parts,

SECTION-I: DEMOGRAPHIC DATA

It consist of age, sex, class of studying religion, type of family, parent education, and occupation, family income, living area, nature of residence, type of house, dietary pattern and source of water.

SECTION-II: CHECKLIST ON KNOWLEDGE REGARDING PERSONAL HYGIENE

It includes the items related to maintenance of personal hygiene.

SECTION-III: HEALTH EDUCATION PAMPLATER ON PERSONAL HYGIENE:

It consist of hand washing, bathing, brushing, nail care, hair care and clean cloths.

SCORING PROCEDURE

There were 30 items pertaining to the knowledge on personal hygiene. Each item has 2 options that includes agree and disagree. Agree carries 2 marks, disagree carries 1 mark. The maximum score was 60. The level of knowledge was categorized based on the percentage of score obtained.

TRANSLATION OF TOOL

Validated tools were translated into Tamil.

PREPARATION OF FINAL DRAFT

The final draft of the check list was prepared after testing the reliability validity and in consultation with the guide.

PERIOD OF DATA COLLECTION

The data collection was conducted from 20.06.2022 to 30.06.2022. Duration this period the investigator collected data from the 60 samples selected by convenient sampling method.

DATA COLLECTION PROCEDURE

The data was collected by using of checklist. The data collection was done between 9am to 4pm. The procedure was explained in detail. The duration of data collection is 25-30 minutes for each student.

PLAN FOR DATA ANALYSIS:

The collected data was planned to be organized, tabulated and analyzed based on the objectives of the study by using descriptive statistics such as percentage, mean and standard deviation.

SUMMARY

A non experimental research design was carried to find out the knowledge regarding personal hygiene among primary school children studying in government primary school, Andipalayam. Checklist was prepared. Before collecting the data consent was obtained from each sample. Analysis was planned to be done by using descriptive statistics.

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DATA ANALYSIS AND INTERPRETATION

ORGANIZATION OF DATA:

Section I : Demographic variables of children.
Section II : Asses the knowledge regarding personal hygiene.
Section III : Association regarding personal hygiene among primary school children with selected variables

FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES

S.NO	DEMOGRAPHIC VARIABLES	FREQUENCY	PERCENTAGE (%)
1.	**Age**		
	a) 5-7 years	23	38.3
	b) 8-10 years	37	61.7
2.	**Studying in which Class**		
	a) First standard	6	10.0
	b) Second standard	14	23.3
	c) Third standard	14	23.3
	d) Fourth standard	15	25.0
	e) Fifth standard	11	18.3
3.	**Educational status of father**		
	a) Illiterate	11	18.3
	b) Primary education	27	45.0
	c) Secondary education	21	35.0
	d) Diploma/degree	1	1.7
4.	**Educational status of mother**		
	a) Illiterate	8	13.3
	b) Primary education	30	50.0
	c) Secondary education	20	33.3
	d) Diploma /degree	2	3.3
5.	**Occupational status of father**		
	a) Coolie	41	68.3
	b) Government employee	2	3.3
	c) Private employee	17	28.3
6.	**Occupational status of mother**		
	a) Unemployment	23	38.3
	b) Coolie	18	30.0
	c) Government employee	9	15.0
	d) Private employee	10	16.7
7.	**Income**		
	a) Rs 3001-6000	26	43.3
	b) Rs 6001-10000	26	43.3
	c) Above Rs 10,001	8	13.3
8.	**Religion**		
	a) Hindu	57	95.0

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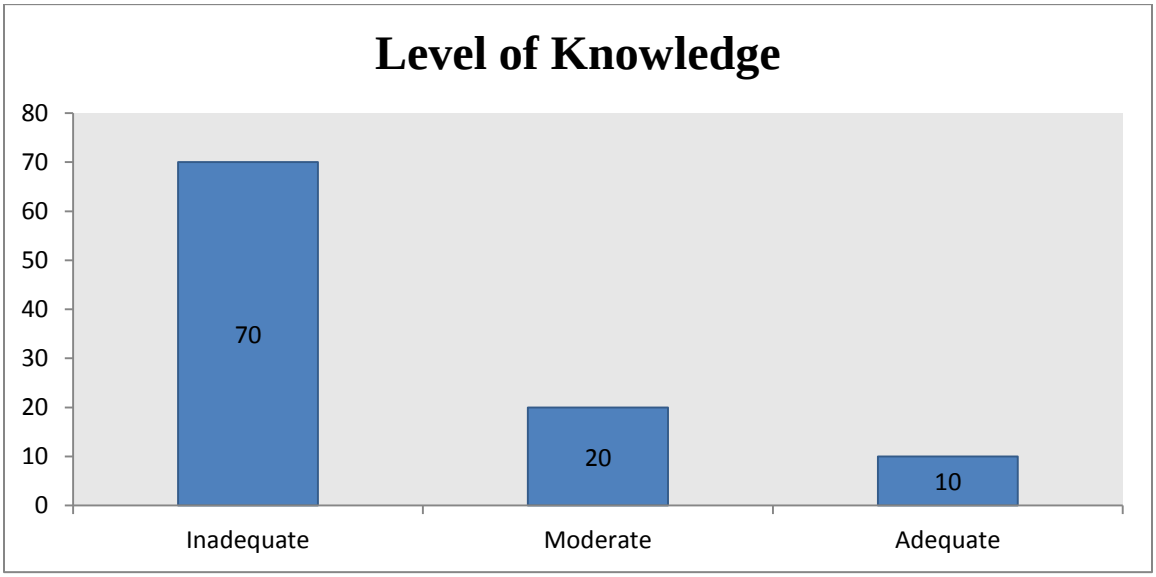
	b) Christian	3	5.0
9.	**Place of living**		
	a) Rural	50	83.3
	b) Urban	10	16.7
10.	**Type of house**		
	a) Kacha house	9	15.0
	b) Pucca house	47	78.3
	c) Thatched house	4	6.7
11.	**Water facility**		
	a) Municipality water	56	93.3
	b) Pump set	4	6.7
12.	**Sources of the information about personal hygiene**	7	11.7
	a) Health workers	14	23.3
	b) Mass media	39	65.0
	c) Parents		

FREQUENCY AND PERCENTAGE DISTRIBUTION OF LEVEL OF KNOWLEDGE REGARDING PERSONAL HYGIENE AMONG PRIMARY SCHOOL CHILDREN

S.NO	LEVEL OF KNOWLEDGE	FREQUENCY	PERCENTAGE(%)
1.	Inadequate	42	70
2.	Moderate	12	20
3.	Adequate	6	10



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shows that the frequency and percentage distribution of knowledge regarding personal hygiene among primary school children.

The finding shows that the maximum 6(10%) children are having adequate knowledge regarding personal hygiene, 12(20%) children are having moderate knowledge and 42(70%) children are having inadequate knowledge.

ASSESSMENT OF ASSOCIATION REGARDING PERSONAL HYGIENE AMONG PRIMARY SCHOOL CHILDREN WITH SELECTED VARIABLES

S. No	Demographic variable	Chi-square value	P value	Level of significance
1.	Age in year	13.371	0.001	Significance
2.	Standard of students	45.080	0.000	Significant
3.	Education of father	4.047	0.670	NS
4.	Education of mother	6.321	0.388	NS
5.	Occupation of father	1.944	0.746	NS
6.	Occupation of mother	10.783	0.095	NS
7.	Income of family	17.780	0.001	Significant
8.	Religion	1.579	0.454	NS
9.	Place of living	9.394	0.009	Significant
10.	Type of house	6.594	0.138	NS
11.	Water facility	1.913	0.384	NS

*-significant at 5% ($p<0.05$) level.

SUMMARY OF THE ASSOCIATION

The above table shows that there are statistically significant association between the level of knowledge, age in years, student class, income of the family and place of living.

There is no significant association between the level of knowledge regarding personal hygiene among primary school children, education of the father, education of the mother, occupation of the father, occupation of the mother, religion, type of house and water facility.

SUMMARY, CONCLUSION, IMPLICATION, AND RECOMMENDATION

This chapter presents the summary of the study conclusion and implication for the nursing practice and recommendation for the future studies.

SUMMARY OF THE STUDY

The purpose of the study was to assess the knowledge regarding personal hygiene among primary school in a selected Government school, Kilinjalmedu

Convenient sampling was used for this study to select the sample descriptive and inferential statistics were used to analysis the data.

IMPLICATIONS

Personal hygiene encompasses all of the daily routines that help keep your body clean. This includes regular healthy habits of brushing your teeth, washing your hair, washing your hands, cleaning your body with soap and water, wearing deodorant when possible and keeping your clothing clean. When pupil don't learn these habits, or they become overlooked certain consequences may develop ranging from social problems to potentially serious diseases.

NURSING EDUCATION

- Curriculum must be designed in such way to discuss about the problems faced by the children occurs by poor personal hygiene and various coping strategies to cope with the problems.
- Involvement of students in training programme to create awareness of the personal hygiene among primary school children.
- Findings of the present study in structuring a curriculum or programme of the study and developing course content and the care of (personal hygiene).

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NURSING ADMINISTRATION

- The study helps the nurse administrators to encourage the school health nurse to teach about the personal hygiene through inservice programme.
- The study helps the nurse administrators to explore their potential innovative ideas in preparation in appropriate teaching material on personal hygiene and relative health tips.
- The administrators should organize awareness camps for primary school children towards the personal hygiene.

NURSING RESEARCH

One of the aims of nursing research is to expand and broaden the scope of nursing the finding of the study will help future researches to explore others aspects of personal hygiene.

It is essential to conduct on more activities teaching modalities to enable the clients to participate in their lifestyle and also this study can be useful for health for health personnel to improve their knowledge and practice. Further investigator can use this study as a reference material.

NURSING SERVICE:

- The nurse need to take up the responsibility to create awareness on the personal hygiene among the school going children.
- Nurse should take the responsibility to conduct the health camp regarding personal hygiene primary school children.
- Nurses are health care providers can provide health education pamphlets to improve the knowledge on personal hygiene among primary school children.

RECOMMENDATION

- A same study can be replicated using large number of samples.
- A comparative study to assess the level of knowledge of personal hygiene among the urban and rural children.
- A study can be conducted to assess the effectiveness of knowledge on personal hygiene among school going children.
- School syllabus may include topics related to personal hygiene.
- Education of school teachers on personal hygiene who are the sources of knowledge for children.

CONCLUSION

The study concluded that 42 (70%) children have inadequate knowledge, 12 (20%) children have moderate knowledge and 6 (10%) children have adequate knowledge on personal hygiene.

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FORMULATION AND EVALUATION OF HERBAL TOPICAL DRUG DELIVERY

Shital Jadhav, Poonam Papule.Shrddha Phatak

ABSTRACT

Herbal therapy and herbal drug predominates in traditional medicine practiced in developed world plant derived substances and herbal medicines have recently attracted the great interest towards their versatile application. The main objective the present study is to formulate and evaluate herbal ointment with antimicrobial activity by using Azadirachta Indica and Bombax Ceiba polymer. The ointment base was prepared and formulation of ointment was done by incorporation of the polymer in the base by levigation method. Ointments were prepared by using different concentration of the polymer such as using 1% Azadirachta Indica, 1% Bombax Ceiba and their combination (0.5% Azadiracta indica and 0.5% Bombax ceiba) w/w. After completion of formulation it was evaluated for its Physicochemical parameter like colour, odour ,pH, Homogenity, solubility, Consistancy, washability, Spreadability, viscosity, extrudability, skin irritation test, diffusion study. The herbal formulations were evaluated for its Antimicrobial activity against Staphylococcus aureus and prepared formulations were also stable at 5˚C and Room temperature. Overall result of this study reveals that this is an effective herbal ointment.

KEYWORDS: *Azadirachta Indica, Bombax Ceiba, Staphylococcus aureus*

INTRODUCTION [1, 2,3,41]

Herbal medicine is making dramatic comeback and increasing number of patients are visiting alternative medicine clinics. Side effects of synthetic medicine are alarming and recent time has seen risk of herbal and herbal-synthetic drug interaction. Traditional medicines if used judiciously can save a lot of time spent in the treatment and thus reducing global burden. Uses of plants and traditional practices will continue to play a significant role in the socio-cultural life of village communities. The herbal drugs and Excipients have more precise action and have no side effects and are economic. Herbal medicine refers to the use of any plants seeds, berries, roots, leaves, bark or flowers for medicinal purposes. Herbal medicine, also called botanical medicine or phyto-medicine, refers to the use of any plant's seeds, berries, roots, leaves, bark or flowers for medicinal purposes. Long practiced outside of conventional medicine, herbalism is becoming more main stream as up-to-date analysis and research show their value in the treatment and prevention of disease. Plants had been used for medicinal purposes long before recorded history.

Natural remedies are more acceptable in the belief that they are safer with fewer side effect that the synthetic one. Herbal formulations have growing demand in the world Market. Recently World Health Organization estimated that 80% of people worldwide rely on herbal medicines for some aspect of their primary healthcare. Whole herbs contain many ingredients, and it is likely that they work to produce the desired medical effect. In earlier study, medicinal plants have been reported to be very beneficial in wound care, promoting the rate of wound healing with pain, discomfort, and scarring to patient.

MATERIALS AND METHODS

Chemicals and reagent

Paraffin Wax (Molychem Mumbai), Cetostearyl Alcohol (SDFCL Mumbai), Lanolin (Oxford Laboratory), Parrafin soft yellow (Dipa chemicals Chhikalthana), Molish Reagent (Oxford Laboratory, Palghar), Ethanol (Molychem Mumbai), Acetone(Molychem Mumbai), Azadirachta Indica (Cidco New Nanded), Bombax Ceiba (Usmannagar Nanded).

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Equipments
Digital pH-Meter, Digital Balance, Brookfield viscometer UV-Visible Spectrophotometer, Autoclave, Incubator, Hot air oven, Digital colony counter, Centrifugation machine, Sonicator, DSC, FTIR

Collection of Plant:
The leaves of Neem plant were collected from cidco New Nanded (Maharashtra). And the Bark of Bombax Ceiba Were collected from the local areas of Usmannagar, Dist. Nanded (Maharashtra)

Preparation of Neem Extract[18]
The leaves were dried at 40-45˚C under shade for 5 days. After drying, the leaves were ground into powder by using grinder. Then take 50 g of dried leaf powder were electronically weighed into 250 ml of conical flask. To this 250 ml of methanol was added and kept for 24 hr with periodic shaking. Filtered and filtrate was collected. The procedure was repeated three times. The collected filtrate was collected.

Preparation of Bombax Ceiba Extract[20]
The bark was collected and peeled off from branches and stem and wash it carefully to remove the foreign particles then cut into small piece with the help of sharp knife. Then wash with water and the small piece of Bark were soaked in cold water, then kept it overnight and crushed with the help of mortar and pestle. Then the sample is centrifugated for 10 min, after centrifugation the particle not settled down because it was clear solution. Then the sample was precipited with acetone. The precipited were separated by using muslin cloth then it was dried in a hot air oven at 50˚C. After drying the sample crushed with the help of mortar and pestle then the powder obtained and it was passed through the sieve no.22

Phytochemical Analysis
The methanolic extract obtained after extraction procedure was subjected to various Phytochemical screening as per the standard procedure to reveals the presence of various active phyto-constituents.

Formulation of Ointment

Table No.1 Formulation of Ointment Base

Sr.No	Name of Ingredient	Quantity to be taken
1	Wool fat	1.5
2	Cetostearyl Alcohol	1.5
3	Hard paraffin	1.5
4	Yellow soft paraffin	24.5

Table No.2 Formulation of Herbal ointment

Sr.No	Name of Ingredient	Quantity to be taken		
		F1	F2	F3
1	Azadirachta Indica Powder	1	0	0.5
2	Bombax ceiba powder	0	1	0.5

Procedure for preparation of ointment
a) Initially the Ointment base was prepared by weighing accurately grated hard paraffin which was placed in evaporating dish on water bath. After melting of hard paraffin remaining ingredients were added and stirred gently to aid melting and mixing homogenously followed by cooling of ointment base.
b) Herbal Ointment was prepared by mixing accurately weighed Neem and Bombax ceiba powder to the Ointment base by levigation method to prepare a smooth paste with 2 or 3 times its weight of base, gradually incorporating more bases until to form homogenous ointment, finally transferred in a suitable container.

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RESULT AND DISCUSSION

Phytochemical characterization of Azadirachta Indica polymer and Bombax Ceiba polymer

Table No. 3 Phytochemical Characterization of polymer

Sr.No	Test	Azadirachta Indica	Bombax Ceiba
1	**Test for carbohydrates**		
a)	Molish's test	-ve	+ve
b)	Fehling Test	-ve	-ve
c)	Benedict Test	-ve	-ve
d)	Barford Test	-ve	-ve
2	**Test for protein Amino acid**		
a)	Biuret Test	-ve	-ve
3	**Test for Phenolic compound**		
a)	Ferric chloride Test	-ve	+ve
b)	Lead Acetate Test	-ve	+ve
c)	Iodine test	-ve	-ve
4	**Test for steroids**		
a)	Salkowski Test	+ve	+ve
5	**Test for terpenoids**		
a)	Libermann-burchard test	+ve	+ve

Physicochemical Characterization

1. **Organoleptic Characteristics:**

Table No 4: Organoleptic Characteristic of powder

Sr. No	Parameter	Observation	
		Azadirachta Indica leaves polymer	Bombax ceiba bark polymer
1	Physical Appearance	Smooth	Smooth
2	Colour	Greenish	Brownish
3	Odour	Bitter	Characteristic
4	Taste	Bitter	Characteristics
5	Nature	Powder	Powder
6	Melting point	154-158	121˚C
7	pH	5.6	5

Micromeritics Properties of Azadirachta Indica & Bombax Ceiba

Table No.5: Micromeritics Properties

Sr.No	Property	Observation(n=3)	
		Azadirachta Indica	Bombax ceiba
1	Bulk Density	0.376±0.04	0.659±0.03
2	Tapped density	0.576±0.009	0.844±0.04
3	Angle of Repose	22.45±37.71	25.63±44.32
4	Hausner's Ratio	1.436±0.028	1.118±0.29
5	Carr's Index	30.47±1.30	22.13±2.85

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Determination of Microbial Load

Table No.6: Total Viable Aerobic count

Micro-organism	Media used	Sample	Microbial count (CFU)	Total count/gm (CFU/GM)
Bacteria	Casein soya bean digest agar	Bombax Ceiba	44	440
		Azadirachta Indica	6	60

Instrumental Analysis

1) Identification by FTIR spectroscopy:

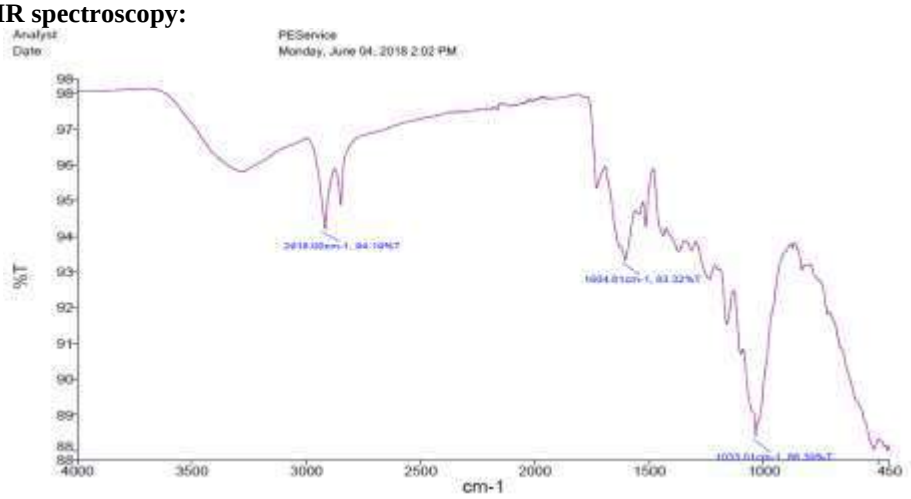

Fig no. 1 FTIR spectrum of Azadirachta Indica polymer

Table No.7 Chracteistics peak of Azadirachta Indica Polymer

Functional Group	Characteristic peak(cm^{-1})	Obtained peak(cm^{-1})
CH-streaching	2600-3000	2918.0
C=C	1600-1700	1604.81
CH-O	1000-1200	1033.01

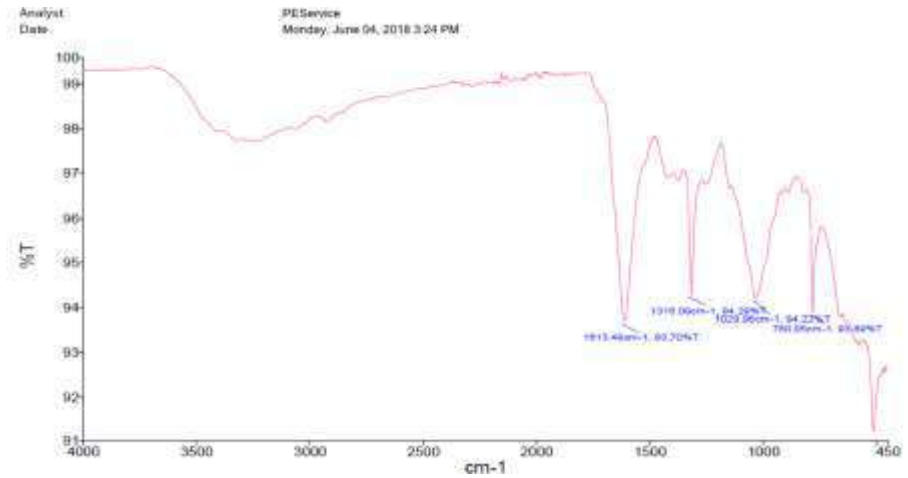

Fig no.2 FTIR spectrum of Bombax Ceiba polymer

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Table No.8 Characteristic peak of Bombax Ceiba Polymer

Functional Group	Characteristic peak(cm^{-1})	Obtained peak(cm^{-1})
CH-streaching	2600-3000	2801
C=C Aromatic	1600-1700	1613.49
CO-C streaching	1050-1150	1029.98
CO-streaching	900-1300	1316.09
CH Bending	680-860	780.05

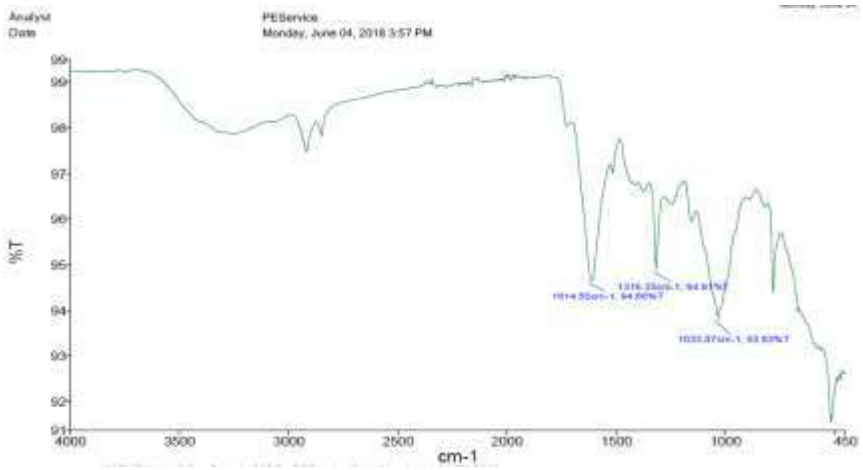

Fig no.3 FTIR spectrum of Azadirachta Indica + Bombax Ceiba Polymer

Table No.9 Characteristic peak of Azadirachta Indica and Bombax Ceiba polymer

Functional Group	Characteristic peak(cm^{-1})	Obtained peak(cm^{-1})
C=C Aromatic streaching	1600-1700	1614.50
CO-streaching	900-1300	1316.25
CO-C streaching	1050-1150	1033.07

2) UV Spectrophotometric analysis

a) Determination of λ max:(Azadirachta Indica):10 mg of powder dissolved in 100 ml phosphate buffer pH 6.8 to get the 100µg/ml stock solution. The ultraviolet spectrum was determined by scanning stock solution of 100µg/ml from 200-800 nm. The λ max of solution was found at 215 nm. as shown in fig

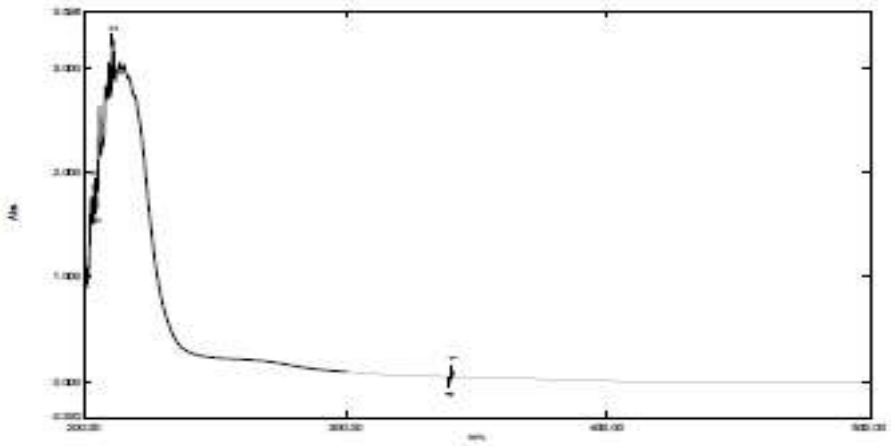

Figure 4: UV Spectrum of Azadirachta Indica

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3) XRD Analysis

The XRD techinique was used to determine the crystal structure of polymer. Azadirachta Indica polymer shows well defined characteristics peak which is in amorphous form and the Bombax Ceiba polymer was show crystalline form.

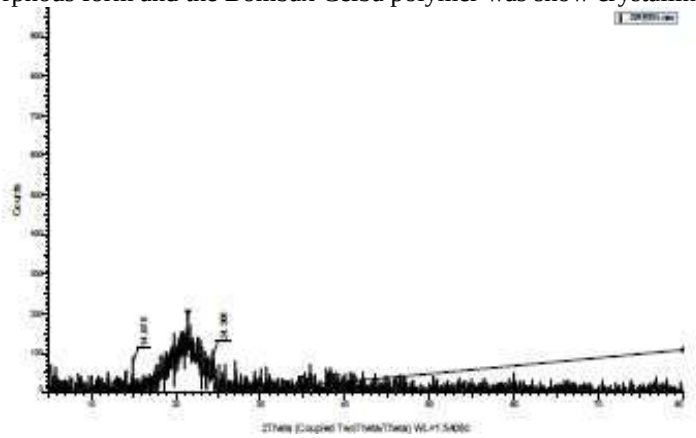

Fig no 5: XRD result for Azadirachta Indica polymer

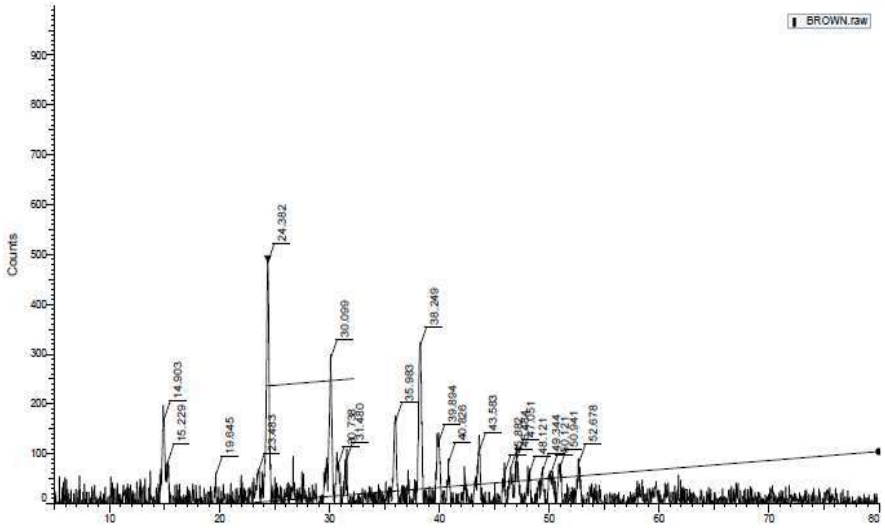

Fig no 6: XRD result for Bombax Ceiba polymer

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4) Diffential Scanning Colorimetry (DSC)

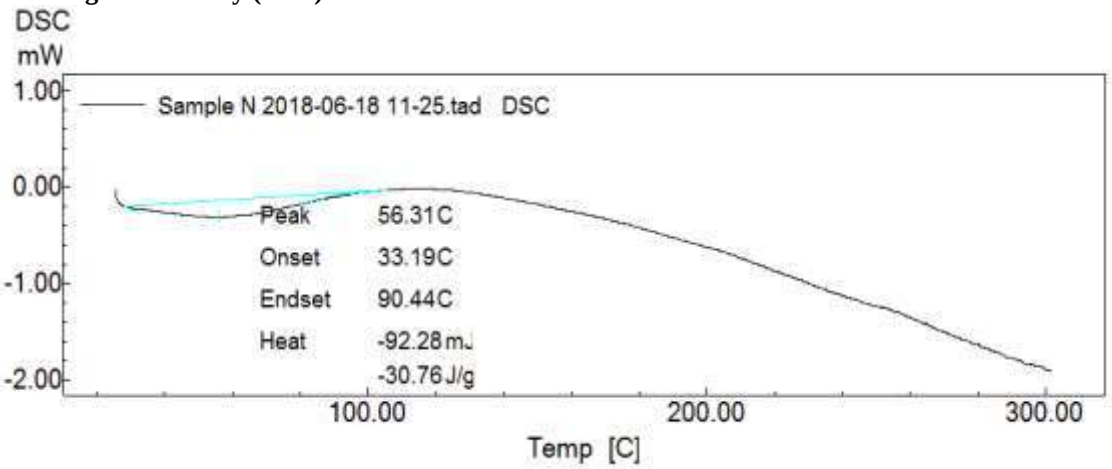

Fig no.7: DSC thermogram of Azadirachta Indica Polymer

Table No.10 Thermal parameter of Azadirachta Indica Polymer

Sr.no	Parameter	Result
	Onset temperature	56.31˚C
	Peak temperature	33.19˚C
	End set temperature	90.44˚C

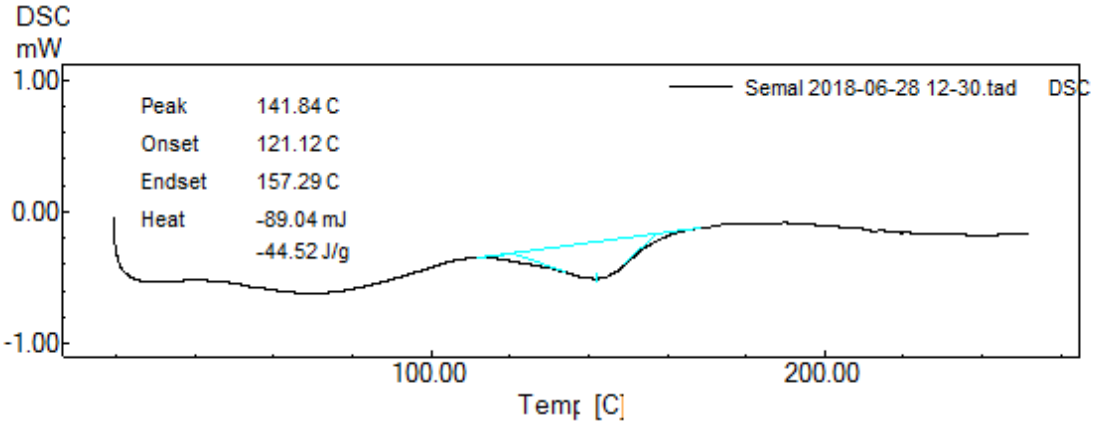

Fig no. 8: DSC thermogram of Bombax Ceiba Polymer

Table no.11 Thermal parameter of Bombax Ceiba Polymer

Sr.no	Parameter	Result
1	Onset temperature	121.12˚C
2	Peak temperature	141.84˚C
3	End set temperature	157.29˚C

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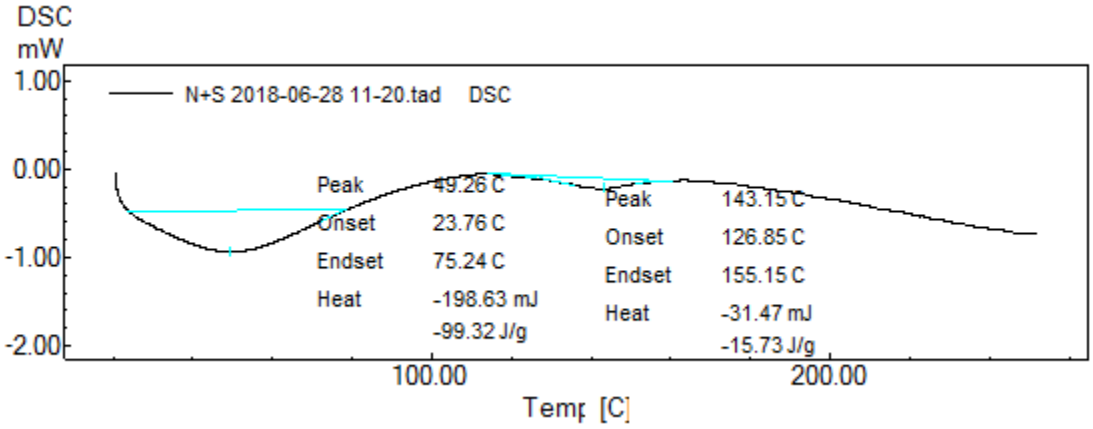

Fig no. 9: DSC thermogram of Azadirachta Indica + Bombax Ceiba (mixture)

Table no.12 Thermal parameter of Azadirachta Indica + Bombax Ceiba (mixture)

Sr.no	Azadirachta Indica	Parameter	Result
1		Onset temperature	23.76˚C
2		Peak temperature	49.26˚C
3		End set temperature	75.24˚C
1	**Bombax Ceiba**	Onset temperature	126.85˚C
2		Peak temperature	155.15˚C
3		End set temperature	143.15˚C

Evaluation of Ointment

1) Appearance

Table no.13 Appearance of Ointment

Sr. No	Physical Parameters	Result		
		F1	F2	F3
1	Colour	Dark Green	Slightly brownish	Faint Green
2	Odour	Characteristics	Characteristics	Characteristics
3	Nature	Semisolid	Semisolid	Semisolid
4	Consistency	Smooth	Smooth	Smooth
5	Grittiness	No grittiness	No grittiness	No grittiness

2) pH determination:

Table No 14: pH of formulation

pH (N=3)		
F1	**F2**	**F3**
6.6±0.278	6.38±0.075	6.44±0.089

3) Homogenity

All formulations Produce uniform distribution of polymer in Ointment. It was confirmed by visual appearance and touch.

4) Consistency

Consistency of all formulation was checked by applying Ointment on skin and it was found that all formulation of ointment has good consistency.

5) Washability

All formulation was applied on skin and washing with water observe following observation

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Table No.15 Washability of ointment

F1	F2	F3
++	+	+

Easily Washable (++), washable (+)
F1 was easily washable when applied on skin as compared to F2 and F3 formulation.

6) Spreadability test[2]

Spreadability was determined by the apparatus which consists of a wooden block, which was provided by a pulley at one end. One glass slide was fixed on wooden block. By this method Spreadability was measured on the basis of slip and drag characteristics of cream and ointment. The excess amount of ointment was placed on fixed ground slide, another glass slide having the same dimensions. The Ointment was sandwiched between two slides, and 50 kg weight was placed on the top of this glass slide to for 5 min to expel air and compress the glass slides of uniform thickness and excess cream and ointment was scraped off from boundaries or edges. Then the top of the slide pull 20 gm of weight with the help of thread or string attached to the one end of hook. The time (in seconds) required by the top slide to cover up a distance of 7.5 cm be noted. A shorter interval indicates better Spreadability.

Spreadability was calculated by using the formula,

Spreadability =m*l/t
m = Weight tide to upper slide
l = length moved on the glass slide
t = time taken

Table no 16: Spreadability of Ointment

Sr. No	Formulation code	Spreadability (g.cm/sec)
1	F1	10
2	F2	14
3	F3	12

7) Viscosity

Viscosity of the formulation was determined by Brookfield DV-E Viscometer using spindle no 64.

Table no.17 Viscosity of Ointment

Spindle No	RPM	Viscosity (cps) (N=3)		
		F1	F2	F3
64	10	54710±586.4	55096±422.53	54500±895.3
	20	28928±395.03	29860±215.48	29490±65.57
	50	11726±139.09	11796±32.15	11824±49.57
	60	9746±115.14	9882±21.16	9671±95.28
	100	5777±75.78	5982±17.89	5931±48.01

Viscosity of F3 formulation shown high viscosity as compared to F1 and F2 formulation.

8) Extrudability study: It is the force required to extrude material out of tube; detemining % of Extrution of Formulation.

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Fig.No.10: Extrudability of formulation

Table No.18 Extrudability Ointment

Formulation	Net Weight of formulation in tube	Weight of formulation extruded	Extrudability amount%
F1	10	8.95 ± 0.14	89.5%
F2	10	8.25 ± 0.14	82.5%
F3	10	8.59 ±0.19	85.9%

All formulations evaluated for Extrusion test in which F1 formulation has highest extrusion among so it indicates that F1 formulation has good extrudability.

9) Antimicrobial test:[49]

Loopfull of provided culture of Pseudomonas aeruginosa and staphylococcus aureus were inoculated in sterile nutrient broth and 5 ml incubated and adjusted to 0.5 by MC Ferlands standards at 37˚C for 24 hours. 0.1 ml of active culture of respective organisms was spreaded on sterile nutrient agar plates and well were cut with the help of borer. To these well labeled wells respective samples were added and also a blank of DMSO+ water was added to labeled well. These plates were kept in refrigerator for 30 min for diffusion, after 30 min plates were incubated at 37˚C for 24 hours. After incubation result were recorded as zone of clearance and well in mm.

Fig no 13 Zone of inhibition of F1, F2 and F3

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Table No.19 Antimicrobial activity of formulated ointment

Sr. no	Formulation	Concentration (mg)	Staphylococcus aureus	
			Zone of Inhibition	
1	F1	66.6 mg	11	
2	F2	33.3 mg	07	
3	F3	66.6 mg	08	

10) Stability testing

Accelerated stability testing of best batch formulation was conducted at room temperature, 5^0C for 60 days and after 60 days formulation was evaluated for following parameters.

Table no 20: Stability test Evaluation of F1 (after 60 days)

Sr. No	Parameter	Temperature conditions	
		5^0C	R.T
1	Colour	Green	Green
2	pH	6.61±0.05	6.78 ±0.21
3	Viscosity	54710±586.4	55096 ±422.53
6	Washability	Easily washable	Easily washable
7	Consistancy	Good	Good
8	Skin irritation	No irritation	No irritation

Hence the formulation is stable after 60 days.

CONCLUSION

Present study concluded that Azadirachta Indica and Bombax Ceiba powder was successfully obtained after extraction their percent yield was found as 10.15%, 1.38 % respectively. Dried powder extract of Azadirachta Indica and Bombax Ceiba is used for formulation of ointment. Obtained powder was preliminary evaluated for various test such as Phytochemical, Physicochemical properties, FTIR, DSC, XRD and UV spectroscopy etc. Successfully prepared ointments by Levigation method, using 1% Azadirachta Indica, 1% Bombax Ceiba and their combination (0.5% Azadiracta indica and 0.5% Bombax ceiba).Formulations are evaluated for pH, Appearance, Spreadability, extrudability, antimicrobial test, skin irritation test for 12 hrs etc. percentage of extruction of F1 was found 89.5 % which was highest as compare to F2 and F3 formulations, it may be due to less viscosity of Azadirachta Indica powder as compare to Bombax Ceiba powder. pH of all formulations within the range of 6.3 to 6.6 so formulations are compatible with skin pH no skin irritations observed. The order of antimicrobial activity observed among the formulation as follows F1 > F2 > F3. F1 was selected as best batch formulation as it shows highest Zone of Inhibition among the F2 and F3 formulation. Stability test proves that formulations are stable after 60 days F1 formulations shows approximately similar results as that of previous, it proves that F1 formulation was stable.

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AYURVEDIC MANAGEMENT OF ALLERGIC CONJUNCTIVITIS (*VATAJA ABHISHYANDA*) - A CASE REPORT

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ABSTRACT

Human body is gifted with 5 sensory organs viz eyes, nose, ears, tongue and skin, amongst which eyes are considered to be the most important one. In ayurveda it is said by acharyas that "sarvendriyanam nayanam pradhanam " At present the world faces an enormous number of challenges when it comes to eyes. Among them allergic conjunctivitis is an escalating one, which is managed by ophthalmologists with the help of antihistamines, NSAIDs, corticosteroids etc. Whereas the same condition can be almost correlated with vataja abhishyanda in ayurveda and its treatment is remarkable with less possibilities of recurrence. Hence, here is a shot to illuminate the ayurvedic intervention of vataja abhishyanda demarcated in samhitas to treat the cases of allergic conjunctivitis.

KEYWORDS - ***Allergic conjunctivitis, ayurveda, vataja abhishyanda ,Kriyakalpa***

INTRODUCTION

Allergic conjunctivitis is an inflammatory disorder that affects the eyes by presenting with redness, itching and watering eyes. It is caused because of the exposure to dust, pollen and mold spores. Conjunctiva being the outermost protective, transparent layer of the eye is most susceptible to the allergens. It is the body's reaction towards the substances which are harmful for the body. This condition may or may not be associated with a runny nose. Allergic conjunctivitis alone has been estimated in 6-30% of the general population and in up to 30% in children alone or in association with allergic rhinitis.[1]Modern trend of management of such conditions advocates avoidance of the allergen and treatment with either topical or systemic steroids/decongestant drops/mast cell stabilizers along with antihistamine and anti-inflammatory agents .This management is not satisfactory and seems to be temporary and also has its own side/adverse effects[2]. *Vataja abhishyanda* having its *lakshana* as *toda* (Pricking pain), *Sangharsha* (foreign body sensation), *Achchasruta* (watery discharge), *Alpa Shopha* (mild chemosis), *Vishushka Bhava* (feeling of dryness) that is almost resonating the signs of allergic conjunctivitis. Therefore, the treatment modality of *vataja abhishyanda* in case of allergic conjunctivitis is more productive than the antihistamines, NSAIDs.

CASE REPORT

A male patient aged 74 years had a complaint of severe itching, frequent rubbing of eyes since past 5 days associated with watering and congestion in both eyes and on getting up in the morning, he noticed matting of eyelashes. He slowly developed photophobia due to which his everyday routine was interrupted. He had similar recurrent episodes since past 2 years, along with complaints like excessive sneezing and nasal blockage, aggravated by exposure to dust and smoke. He consulted various ophthalmologists but had found no satisfying result, for which the patient shifted this time towards *ayurvedic* treatment and visited our hospital.

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CLINICAL FINDING

Eye examination (Visual Acuity Assessment)

				PG	
	DV	NV	PH	DV	NV
RE	6/36	N12	6/9	6/9	N6
LE	6/12	N8	6/6	6/6	N6
BE	6/12	N8		6/6	N6

	AR Readings			KR Readings		
	Sph	Cyl	Axis	K1	K2	Axis
RE	–1.75	–0.75	89	43.00	44.00	93
LE	–1.00	–0.50	110	43.50	44.50	98

Slit Lamp Examination (Before Treatment)

PARTS OF EYE	RIGHT	LEFT
Head Posture	Not effected	Not effected
Ocular Posture	Orthophoric	Orthophoric
Eye brows	Normal position	Normal position
Eye lashes	Matting of eyelashes	Matting of eyelashes
Eye lid margin	Normal	Normal
Eye lids	Difficulty in movement of lids	Difficulty in movement of lids
Conjunctiva	Congested	Congested
Sclera	Normal	Normal
Cornea	Clear	Clear
Anterior Chamber	Normal Depth	Normal Depth
Iris	Normal pattern, brown	Normal pattern, brown
Pupils	Normal, Reactive, 3mm	Normal, Reactive, 3mm
Lens	Pseudophakia	Pseudophakia

INVESTIGATIONS

Complete blood count was done, where Hemoglobin, WBC, ESR were in normal range; Lymphocytes, Eosinophil count were higher than normal range but there was mild decrease in Neutrophil, Monocyte count. Absolute Eosinophil count was highly increased(800cells/mm). Sac patency test, Tear break up test (TBUT) and Schirmer's Test was also done and readings were noted down.

CLINICAL ASSESSMENT

Patient was assessed using subjective characteristics (*lakshanas*) of *vataja* abhishyanda. And also the signs of allergic conjunctivitis observed which were as follows -

Sign & Symptoms	Ayurvedic correlation[3]
Pricking sensation	*Nishtoda*
Unsteady	*Chala*
Watery discharge	*Shishirabh Ashruta*
Nasal congestion	*Nasanaha*
Oedema	*Alpashopha*
Tearing pain	*Sphutana*
Breaking pain	*Bhedana*
Recurrent sneezing	
Photophobia	
Matting of eyelashes	
Congestion	
Excessive itching	

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INTERVENTION GIVEN

Acharyas have mentioned *Shodhana Vidhi* (drug with *shodhana guna* helps in removing toxins from gut and cleanse body from inside) followed by *Sthanik chikitsa* such as *Nasya, Aschyotana, Netra Seka, Pindi.*[4] In this case, a combination of herbo-mineral/ herbal preparation was administered to provide therapeutic effects.

INTERNAL MEDICINE

Haridrakhanda churna-1.5gm
Sitopladi churna-1.5gm
Talisadi churna-1.5gm
Haritaki churna-0.5gm
This powder combination dose was given 2 times daily for 7 days with honey after food.

IPD PLAN OF CARE-

1	*Sadhyo virechana*	*GHC oil(60ml) + Milk(100ml) + Guda (10gm)*	1st Day, 5 vegas, diet: *peya* for lunch and *laghu ahara* at night for dinner
2	*Nasya*	*Anu taila*	Once daily for 7 days
3	*Aschyotana*	*Shigru patra + Madhu*	Twice daily for 7 days
4	*Netra Seka*	*Triphala Kashaya*	Twice daily for 7 days
5	*Pindi*	*Eranda + Nimbu patra kalka* [5]	Twice daily for 7 days

Timeline
Total Study Period- 1 month
Treatment period-7 days
Follow up- 15th and 30th day

Outcome
During course of IPD admission-
Reduction in lacrimation
Itching and foreign body sensation reduced completely
No photophobia and matting of eyelashes on waking up.

Follow up on 30th day
AEC reduced to 580 cells/mm
Bowels are regular
Overall health status maintained.

DISCUSSION

As a preventive aspect Sushruta Acharya says *Nidanaparivarjana*, to break up the entry of causative factors and prevent the disease, so we advised him to avoid exposure to cold and smoke, intake of cold water that in turn vitiates the *Alochaka pitta* present in the eyes.

Virechana
Administration of GHC (*gandharvahasthadi castor oil*), Milk and jaggery spreads throughout the body at cellular level and entres into micro and macro channels with its specific quality,dragging the *doshas* from *shakha* to *kostha* and eliminates them through anal route. *virechana* karma helps in samprapti vighatana of *abhishyanda*.

Nasya
Nasya refers to nasal instillation of medication in form of smoke, powder or drops of oil, liquid or *swarasa*. The medicated *taila* given here poses *sukhsma guna* so it is easier to absorb through *shleshmika kala* of nose and from the nose, it reaches the *shringataka* a *siramarma*, and entres the murdha and expels the morbid doshas from urdhrwajatru and uttamanga[6]According to Acharya Charaka,

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Anu taila being *vataghana , brumhana* and *snehana* helps in reducing the symptoms as it liquifies the doshas, extract them from the site and ultimately improve the efficacy of *indriyas* i.e *nasa karna* and *netra*.[7]

Aschyotana

It is the first line of treatment in all eye- related disorders. Usually, the medicine, (medicated ghee or drops) are instilled into the eyes that are kept open. The prescribed height from which this should be done is mentioned as 2 *Angula* [8] It can be done in the following conditions: foreign body sensation, irritation and redness of the eye, itching of the eye, painful and watery eyes and burning sensation of the eyes. *Madhu Shigru Aschyotana* contains *katu rasa* of *shigru* will help in *srotoshodana* and breakdown of *abhishyantdtva* which alleviates itching, lid and conjunctival swelling and *Guruta. Tikta Rasa* is also present in *Shigru. Tikta* rasa will do *shoshana*. *Shigru* having *vata kapha shamaka chaksushya* and *Lekhana* properties, which alleviates *Abhishyanda*.[9]

Seka

Medicated liquid is poured as *Suksma Dhara* (thin stream) over the closed eyes continuously from a recommended height of 4 *Angula*, for a specified time. *Thiphala kashya seka* was used in this patient. *Triphala* has *chaksushya* property and could prove helpful in breaking the *abhisyandatva* of *doshas* in the *srotas* by virtue of its *ushna* and *ruksha* properties. Further, *triphala* is reported to be a potent free radical scavenger and possesses antioxidant, anti-inflammatory, analgesic, antibacterial, and immuno-modulatory properties. So, *triphala kashya seka* helps in removing the congestion, increases vasodilation and reduces the symptoms.[10]

Pindi

The medicated paste is wrapped in a thick cotton bandage or *Doshaghna* leaves and then kept in tightly over the closed eyelids. The medicine is absorbed through skin lids and due to heat of *pindi* local temperature increases result in vasodilation. It relieves symptoms such as *Netra Abhishyanda, Adhimantha, Shotha, Netra Kandu* and also indicated in acute stages of all eye diseases. *Eranda patra* being *vata shamka* and *nimba patr*a being *kapha shamka* and having *raktshodhaka* and *krimighana* properties will help in reducing the symptoms.

Shamana Ayushadhi

Haridra khanda having *rasayana, jeevaniya, balya, brihaniya, dhatuposhaka* indirectly increases will help in reducing the recurrence of disease [11]. *Sitopaladi churna* has antihistaminic activity and can help you tackle allergies.[12] Similarly, *Talisadi choorna* has significant anti-inflammatory and antihistaminic properties.[13] *Haritaki* contain five Rasa except *Lavana* with *Kashaya* predominance. It has inherent properties for absorption of secretion in the body thus doing *srotoshodhana*. It also helps in *vata anulomana* and having anti allergic and anti-inflammatory properties.[14]

CONCLUSION

The clinical features of *Vataja Abhishyanda* explained in all classical texts resemble with most of sign and symptoms of allergic conjunctivitis. The treatment helps in reducing the absolute eosinophilic count. As a conclusive remark, we affirm that *Ayurveda* possess a useful approach, quality procedures and abundant reserve of herbal drugs which can be employed in the management of *vataja Abhishyanda*(Allergic Conjunctivitis) with proper diet and regimen.[15] *Ayurvedic* drugs used in this treatment are easily available. This overall regimen did not cause any unwanted effects.

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PROSPECTIVES OF NATURAL POLYMERS IN GASTRORETENTIVE FLOATING DRUG DELIVERY SYSTEM: A REVIEW

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ABSTRACT
The main objective of review is to collate the current literature on natural polymers being used for production of different floating systems which includes effervescent and non-effervescent systems. Natural polymers are versatile in characteristics, they are safe, non-toxic and inexpensive for use. All these characteristics of natural polymers make them suitable for Gastroretentive system. Natural polymers are widely investigated for their medicinal use and there more effectiveness than synthetic polymers. Thus, the present study focuses on the various polymers being utilized in floating drug delivery system. Use of polymers including guar gum, xanthan gum, tamarind gum, starch, pectin, okra has been reported by researchers to sustained the release of drug over prolonged period.
KEYWORDS; *FDDS, natural polymers, sustained release, GRDDS, effervescent, non-effervescent system*

INTRODUCTION

Oral administration of drug is the most promising route of administration due to its patient compliance and ease of manufacturing. However, this route has several limitations including variable gastrointestinal transit, incomplete release of drug and short residence time. This results in incomplete drug absorption. Gastroretentive drug delivery system has emerged as the ultimate approach to overcome these limitations. For local or systemic effects GRDDS is a technique used to lengthen gastric residence time of dosage form in upper GIT.[1] In the formulation of GRDDS variety of approaches have been attempted. These encompass floating, swellable and expandable, high-density, bio adhesive and gel-forming systems. The main goal of GRDDS is to increase GRT of dosage forms up to several hours which leads to enhancement of time between the dose administration and drug release occurs at desired rate. Out of the major types of GRDDS, the most favorable are the low-density systems.[2] FDDS have density lower than stomach fluid which permits them to remain buoyant for a prolonged time.[3] The polymers used for the preparation low density system are complex in their characteristics. numerous polymers are being used for the formulation of tablet, capsules and microspheres etc.in last 2 decades the used of natural polymers have gathered attention because of easily availability, low cost, non-toxic etc.

MAIN TYPES OF GRDDS [4]

1. Bio adhesive DDS
2. Expandable DDS
3. High density systems
4. Low density System (FDDS)

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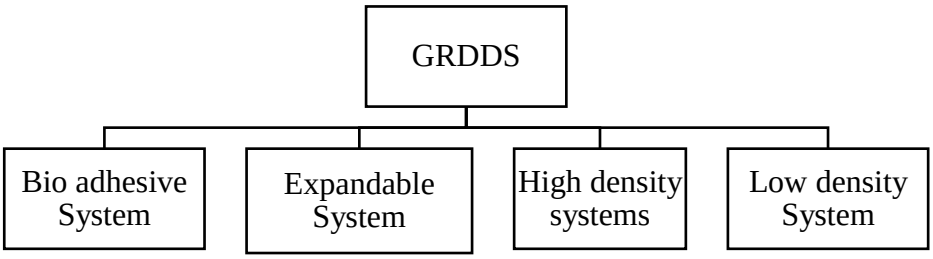
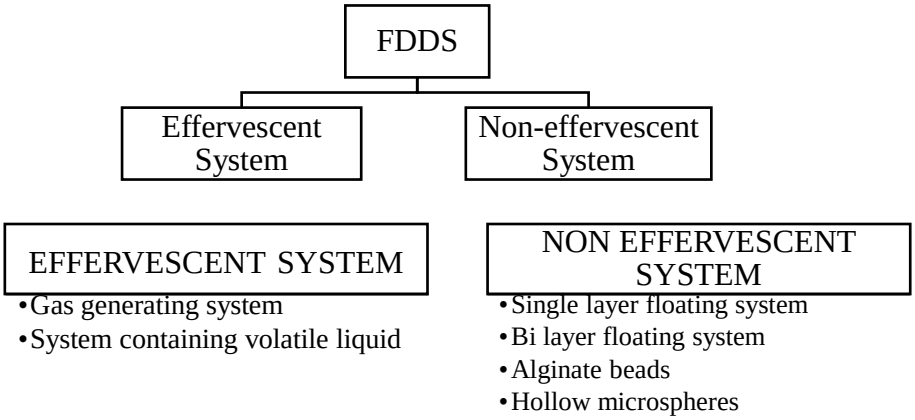
a) Non-effervescent system



b) Gas-generating system



FLOATING DRUG DELIVERY SYSTEM

It has lower density than gut fluid which makes them remain buoyant in gut without influencing gastric emptying rate. thus, the release of drug occurs at desired rate for prolonged time. From the stomach the residual system gets cleared when the drug is fully released. As an outcome plasma drug concentration fluctuations are controlled and GRT is increased.

Gas-generating (Effervescent) systems

These buoyant systems contains matrices developed with polymers which are swellable and contain effervescent components (e.g., sodium hydrogen carbonate, calcium carbonate). The drug when reaches gut, carbon dioxide is produced which causes it to float over the stomach fluid.

Non effervescent systems

These are referred to as plug type as they work by obstructing pyloric sphincter of the stomach by swelling in the gastric fluid. In these systems the drug and gel are mixed together and when the formulation comes in contact with the gastric fluid gel begins to swells and shut off the pyloric sphincter.

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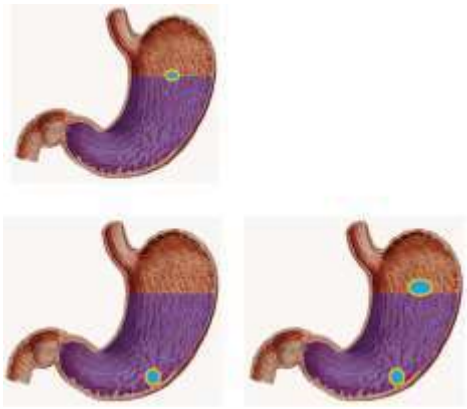

Figure 1 Floating systems. Low-density system. [5]

ADVANTAGES OF FDDS

1. It causes better patient compliance by declining frequency of dosing.
2. It shows better therapeutic effect for drugs which have short half-life.
3. Buoyancy leads to enhanced Gastric retention time of dosage form.[6]
4. Drug releases in controlled manner for longer time.
5. It directs site-specific delivery of drug in stomach.
6. Drugs which solubilizes in gut region only, it intensifies absorption of drugs.

LIMITATIONS OF FDDS

1. Higher amount of fluid in stomach is important for maintaining buoyancy.
2. It is not good fit for drugs having solubility or stability issues in gastric fluid.[6]
3. It is not suitable for drugs which irritate gastric mucosa.

POLYMERS IN FLOATING DRUG DELIVERY SYSTEM

For last 20 years polymers researchers have been widely reported the used for delivery of active drugs. Because of the advantages of natural polymers over synthetic one's natural polymers has a promising scope in Gastroretentive drug delivery including floating drug delivery approach. On the basis of origin, the polymers can be natural (chitosan, sodium alginate) semisynthetic (Ethyl cellulose, HPMC) and synthetic (acrylic acid derivatives, lactic acid derivatives).[7]

ADVANTAGES OF NATURAL POLYMERS

1. They are biodegradable
2. They are biocompatible and non-poisonous.
3. They are economical.
4. They are non-polluting
5. They are easily accessible.

DISADVANTAGES OF NATURAL POLYMERS

1. They can be microbially contaminated.
2. There may be batch to batch differences.
3. They can have rate of hydration unrestricted.
4. The consistency may get reduced on storage.

Table 1. Structural features and sources of natural polymer for FDDS [1,12,14,17]

Natural polymer	Basic chain	Source
Chitosan	Deacetylated P-1, 4-N-acetyl-1-D-glucosamine	Shell of marine invertebrates
Guar gum	β-D-mannopyranose	*Cyamopsis tetragonolobus*
Xanthum gum	β-(1,4)-linked D-glucose	Fermentation of glucose by *Xanthomonas campestris*
Pectin	α-(1,4)- linked D-galacturonic acid	Citrus peel, sugar beet pulp etc.
Starch	α-(1,4)-linked D-glucose and α-(1,6)-	Storage polysaccharide in plants

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	linked D-glucose	
Tamarind gum		*Tamarindus indica*
Gellan gum	D-glucose, D-glucuronic acid and rhamnose in ß-1, 4 linkage	*Pseudomonas elodea*
Okra gum		*Hibiscus esculentus*
Locust bean gum	1, 4-linked D-mannopyranosyl unit	*Ceratonia siliqua*
Mimosa gum		*Mimosa pudica*
Aloe mucilage		*Aloe barbadensis*
Salep	D-glycopyranosyl and D-mannopyranosyl	*Orchis mascula*
Psyllium husk	ß-(1-4)-linked D-xylopyranosyl	*Plantago ovata* seed coats
Karaya gum	D-galactose, L- rhamnose and D-galacturonic acid mixture	Plant (*Sterculia urens*)
Cashew gum	(1-3) -linked β–D-galactopyranosyl units with β- (1-6) linkages.	*Anacardium occidentale*
Alginates	1-4' linked-ß-D-mannuronic acid and α-L-glucuronic acid	*Laminaria hyperborea, Ascophyllum nodosum, Macrocystis pyrifera etc.*

Chitosan

It is composed of glucosamine and N-acetyl glucosamine which is a linear cationic polysaccharide.[8] it is obtained from crustacean shells which is formed by deacetylation of chitin. It is biocompatible, biodegradable, nontoxic and odorless in character. It is having creamy, white flakes or powder which is soluble in water and partially insoluble in 95% ethanol. It is used as disintegrants, binder, viscosity enhancing, mucoadhesive, film forming and coating agent.

Chavda H et al developed a superporous hydrogel composed of chitosan as natural polymer for floating and sustained delivery of ranitidine hydrochloride. It was reported that formed drug delivery system floated for 17 hours and thus is a promising approach for stomach-specific delivery of Ranitidine hydrochloride. [9]

Guar Gum

Guar gum is a plant polysaccharide obtained from seeds of *Cymopsis tetragonolobus* belonging to family Leguminosae.[10] In existence of water it swells instantly forming translucent suspension which is due to presence of guar gum binary content. Its water-soluble fraction is called Guaran. It is incompatible with acetone, ethanol, tannins, strong acids and alkalis and compatible with other plant hydrocolloids. Guaran has high molecular weight and is made up of 2 units of D-galactose per unit of D-mannose. Because of ability of Guar to enhance its viscosity it is used as a disintegrants and binder in formulation of solid dosage forms.
Hajare A et al formulated the metformin hydrochloride floating tablets using guar gum and k-Carrageen as natural polymer and synthetic polymer as HPMC. The tablets formulated by wet granulation technique with natural polymers which exhibited good results in terms of in vitro buoyancy study, better matrix integrity and drug released in sustained manner. The study concluded that natural polymers containing FDDS is a promising approach. [11]

Xanthan Gum

It is a long-chain polysaccharide having large number of trisaccharide in side chains. The chains are produced with the help of bacteria named Xanthomonas campestris by aerobic fermentation of carbohydrates. It is having high molecular weight. The major chain is composed of b-(1,4)-linked D-glucose units and the side chains composed of two mannose and one glucuronic acid unit.[12] In water gum forms delicate structure, which at low concentration creates high viscosity solutions.

Rashmitha, V et al investigated floating tablets of fenoverine by utilizing xanthan gum and sodium alginate as polymers. The formulation was prepared by direct compression method. The study reported that the fenoverine alone can not release the drug for 12 hours but the drug containing polymers shows release efficacy of 12 hours. [13]

Pectin

Pectin is a linear polysaccharide, non-starch which surrounds dividing plant cells. They have average molecular weight between 50,000 to 180,000. It is linear polymers of primarily α-(1,4)-linked D galacturonic acid residues interrupted by 1,2-linked L-rhamnose residues It is soluble in water and insoluble in ethanol and other organic solvents. For trade purposes pectin is obtained from lemon, lime and grapefruit, and apple etc. Pectin act as gelling agents, thickeners, stabilizing agent in food and pharmaceutical. Pectin is classified on the basis of its degree of esterification DE. 50% DE or greater is high-methoxypectin, and the one with DE below 50% is low-methoxypectin. These both types of pectin is having different properties.[14]

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Jyotirmoy G et al designed metformin hydrochloride floating tablets using pectin as natural polymer and HPMC as floating agent. The tablets were formulated by wet granulation method. The In vitro release studies indicate that pectin containing tablets shows sustained release action and increased bioavailability. [15]

Starch

It is a carbohydrate reserve in green plants and is found in seeds. It appears in the form of starch grains which is comprised of polymers, nameld amylose and amylopectin. Amylose is crystalline in nature having average molecular weights 5,00,000 which is soluble in boiling water but amylopectin do not soluble in boiling water. The enzymes at acetal linkage hydrolyze these 2 fractions. Various types of starch have been studied for various pharmaceutical applications including maize (Zea mays), rice (Oryza sativa), wheat (Triticum aestivum) and potato (Solanum tuberosum).

Sonar S et al designed bilayer floating bio adhesive tablets of rosiglitazone maleate by using HPMC and starch as polymer. The formed tablets were evaluated and reported to have buoyancy of upto 8 hours in stomach. [16]

Tamarind seed polysaccharide

It is a galactoxyloglucan seed polysaccharide obtained from *Tamarindus indica*. It exhibits sustained release behavior for both water-soluble and insoluble drugs. Caffeine, acetaminophen, theophylline behaves as water-soluble drug and salicylic acid, indomethacin as water-insoluble drug.[17]

Nayak K et al designed gelled microparticles of tamarind gum and sterculia gum for sustained release of drug. The microparticle were made by using different techniques including ionotropic gelation, ionotropic emulsion gelation, covalent cross-linking, combined ionotropic gelation or covalent cross-linking technique. The both gums based microparticles were found to have higher encapsulation capacity of drug in sustained and prolonged release of drug. [18]

Gellan Gum

It is a linear polysaccharide obtained from *Spingomonas elodea* as a fermented product having high molecular weight, and is deacetylated extracellularly. It is anionic and shows good release, increased gel strength, better stability, possess flexibility, increased clarity, film forming and thermally reversible gel characteristics.

Rajinikanth P et al designed floating in situ gel of amoxicillin for eradication of H. Pylori bacteria. The study reported that the formed gel has sustained release of drug from gel for over 8 hours. the formulated in situ gels shows effectiveness in clearing H. pylori bacteria to some extent. [19]

Okra Gum

The gum is collected from the pods of *Hibiscus esculentus*. At lower concentration it yields increased viscosity mucilage. Different coil polysaccharides are present which consists of rhamnose, galactose and galacturonic acid. The gum is used as binding agent, increase friability, hardness and drug release profiles. It has an advantage over other commercial synthetic polymers as it is chemically safe, inert, biodegradable, nonirritant, and biocompatible..

Alalor CA et al formulated ciprofloxacin floating-bio adhesive tablet using Okra Gum as polymer having multiple functions. The ciprofloxacin granules were formulated by using wet granulation technique. The study investigated that the okra gum alone or in combination with HPMC and sodium alginate shows good floating and bio adhesive property. Thus, this Gastroretentive formulation can be used for elimination of H. Pylori and in treatment of Salmonella typhi induced enteric fever. [20]

Locust Bean Gum

It is obtained from the seeds of *Ceratonia siliqua Linn*, consisting of neutral galactomannan polymer made up of 1, 4-linked D-mannopyranosyl units. The gum is used as gelling, stabilizer and thickening agent. In the preparation and development of various novel drug delivery systems the gum has wide applications.

Jagdale, S et al designed and developed floating system of tapentadol hydrochloride by using mixture of Xanthan and Locust bean gum. The study revealed that the sodium bicarbonate and citric acid provides floating property to drug and on the other side xanthoma and locust bean gum in balanced ratio shows sustained drug release the floating ability. [21]

Mimosa Gum

The gum is scientifically known as e *Mimosa pudica* (Mimosaceae). It is a shrubby plant having bipinnate leaves with glandular hairs, spinouts stipules, Companulate calyxes and lilac pinkish axilary flower heads.[22] The active constituents from plant boost

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health and reduce illness. The gum is having pharmacological activities including anti-inflammatory, anticonvulsant, anti-ulcer, antifungal and anti-malarial activity.

Samala M et al formulated Gastroretentive dosage form of Nizatidine by utilizing mimosa gum as rate retarding polymer. The tablets were formulated to study increase in the bioavailability of the drug by suing statistical approach. [23]

Aloe Mucilage

It is found from leaves of *Aloe barbadensis*. The pulp of aloe contains proteins, lipids, amino acids, vitamins, enzymes, inorganic, organic and various carbohydrates. Because of its therapeutic, healing properties it has been since several centuries. In is used in tablets, capsules, ointments and in gel preparations.

N Ranade et al formulated bilayer floating dosage form of amoxicillin and powder of alo vera gel by using direct compression technique. Aloe vera has mucoprotective effect and is reported to have anti-ulcer activity. [24]

Salep

It is obtained from dried palmates of tubers of *Orchis mascula* belonging to family Orchidaceae.[25] Glucomannan is the major polysaccharide present. It is forms a viscous solution and is highly soluble in hot and cold water. It contains D-glycopyranosyl and Dmannopyranosyl units in ratio of 1:3.3.

Razavi M et al designed Gastroretentive matrix dosage form of famotidine. Evaluation and characterization of formed tablets by in vitro release study shows that formulation shows complete drug release in 24 hours with better buoyancy profile. [26]

Psyllium Husk

It is a polymeric substance obtained from dried seed coats of *Plantago ovate*. It is swellable, biocompatible, inexpensive and biodegradable. The seed contains lipids with unsaturated fatty acids, sterols, proteins, traces of alkaloids and carbohydrates. Psyllium husk shows better release retardant properties.

Kharia A et al developed floating tablets of acyclovir by utilizing psyllium husk and HPMC K4M as polymer. the formulations were made by wet granulation method. The study investigated that both polymers do not interact with each other and thus, can be used in floating systems. [27]

Karaya Gum

It is a vegetable gum obtained from trees as an exudate of the genus *Sterculia.* Chemically, it is an acid polysaccharide consisting of sugar such as galactose, rhamnose, and galacturonic acid. It is inexpensive gum and used in products, including cosmetics, hair sprays, and lotions. Even at low concentration it rapidly takes water and enlarge to form viscous colloidal solution.

Gangadharappa H V et al designed floating formulation of verapamil hydrochloride utilizing mixture of karaya gum and HPMC. The floating tablets were made by direct compression technique and evaluated for floating lag time, weight variation test, hardness, thickness, swelling and dissolution studies. The study reported that the optimized formulation shows satisfied floating capacity, less floating lag time, and drug release for 8 hours. [28]

Singh B et al formulated beads of alginate and sterculia gum utilizing $BaCl_2$ as a crosslinker by using ionotropic gelation technique. the beads were loaded with pantoprazole as a drug. The study reported that from beads the diffusion rate of drug was slower and thus, it is suitable for retention of drug in stomach. The drug can be released for longer period. [29]

Cashew Gum

Cashew gum obtained from from the cashew tree *Anacardium occidentale* belonginf to family, Anarcardiaceae. The gum consists of galactose, arabinose, rhamnose, glucose, glucuronic acid and other residue of sugars. L- arabinose, L- rhamnose, D- galactose and glucuronic acid are produced by the hydrolysis of gum.[30] The gum has wide applications in pharmaceutical industries like colloidal stabilizer, thickening and gelling agent.

Paula H et al developed floating beads prepared from alginate and cashew gum with essential oil for larvicide release. the beads were designed by ionotropic gelation technique. The parameters such as buoyancy, swelling, and dissolution studies were performed. The study reflects the result that alginate and cashew gum floating beads loaded with larvicide has enhanced oil entrapment efficiency, better ability to float, and suitable larvicide release profile. [31]

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Alginates

These are polysaccharides which are unbranched consisting of 1/4 linked b-D-mannuronic acid (M) and C-5 epimer a-L-guluronic acid (G). It is biodegradable liner polymer occuring in brown seaweed and marine algae namely *Laminaria hyperborea, Ascophyllum nodosum and Macrocystis pyrifera*.[32] alginates are used in wound dressing and alginate gel is being used in cystic fibrosis and diabetes treatment. The alginates are further modified to have additional crosslinking strength, improved biodegradation and increase hydrophobicity of the backbone.

Raafat et al designed floating alginate beads loaded amoxicillin trihydrate for the treatment of H pylori treatment. Beads were made by transformation of alginate with N, N-dimethylamino ethyl methacrylate by using graft copolymerization method. The beads also contain calcium carbonate as gas producing agent and calcium chloride as crosslinker. The formed (Alg-g-DMAEMA) copolymers shows increased gastric residence time of upto 24 hours and improved bioavailability. The study reports that the formed alginate beads loaded can eradicate 95% of H pylori after 10 hours. [33]

CONCLUSION

Natural polymers have been widely used in the formulations for many reasons like binding, thickening, suspending and disintegrating agent etc. In the recent years there has been increased interest in natural polymers because some they are inexpensive, easily available, biodegradable and non-toxic in comparison with synthetic polymers. The researches on natural polymeric material and its modifications have gained attention. However, a lot of work still needs to be done in field of low-density system. Utilization of various natural polymers in low-density system to deliver the drug in sustained over prolonged period for treatment of various diseases.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

$(1, 2)^*$-QUASI η-NORMAL SPACES IN BITOPOLOGY

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ABSTRACT

In this paper, we introduce a new class of normal space called, $(1, 2)^*$-quasi η-normal space. The relationships among $(1, 2)^*$-normal, $(1, 2)^*$-quasi η-normal, mildly $(1, 2)^*$-normal, $(1, 2)^*$-quasi α-normal, $(1, 2)^*$-mildly α-normal, $(1, 2)^*$-α-normal and mildly $(1, 2)^*$-η-normal spaces are investigated. Moreover, we introduce some closed functions such as $(1, 2)^*$-πgη-closed and almost $(1, 2)^*$-πgη-closed. Utilizing $(1, 2)^*$-πgη-closed sets and some functions, we obtain some characterizations and preservation theorems for $(1, 2)^*$-quasi η-normal spaces.

KEYWORDS: *$(1, 2)^*$-η-open, $(1, 2)^*$-πgη-closed sets; $(1, 2)^*$-πgη-closed, almost $(1, 2)^*$-πgη-closed, $(1, 2)^*$-πgη-continuous, almost $(1, 2)^*$-πgη-continuous functions; $(1, 2)^*$-η-normal, $(1, 2)^*$-quasi η-normal spaces.*

2020 AMS Subject Classification: 54A05, 54A10, 54E55

1. INTRODUCTION

The study of bitopological space was first initiated by Kelly [**7**] in 1963. By using the topological notions, namely, semi-open, α-open and pre-open sets, many new bitopological sets are defined and studied by many topologists. In 1990, Lal and Rahman [**13**] studied quasi normal spaces in topological spaces and obtained their properties. In 2000, Dontchev and Noiri [**4**] further studied quasi normal spaces in topological spaces and obtained their characterizations. In 2004, Ravi and Thivagar [**16**] studied the concept of stronger from of $(1, 2)^*$-quotient mapping in bitopological spaces and also introduced the concepts of $(1, 2)^*$-semi-open and $(1, 2)^*$-α-open sets. In 2010, Arockiarani [**2**] introduced $(1, 2)^*$-πgα-closed sets in bitopological spaces and studied some basic properties of $(1, 2)^*$-πgα-closed sets. In 2010, K. Kayathri et al. [**6**] introduced and studied a new class of sets called regular $(1, 2)^*$-g-closed sets and used it to obtain a new class of functions called $(1, 2)^*$-rg-continuous and almost $(1, 2)^*$-rg-closed functions in bitopological spaces and also obtained characterizations and preservation theorems for mildly $(1, 2)^*$-normal spaces. In 2011, Arockiarani [**3**] introduced $(1, 2)^*$-α-normal spaces in bitopological spaces and studied some basic properties. In 2018, H. Kumar [**8**] introduced and studied some weaker forms of quasi normal spaces in topological spaces and obtained their characterizations. In 2022, H. Kumar [**9**] introduced the concept of $(1, 2)^*$-η-open sets and $(1, 2)^*$-η-neighbourhood and; studied their properties. H. Kumar [**10**] introduced the concept of $(1, 2)^*$-generalized η-closed sets and studied some basic properties of $(1, 2)^*$-gη-closed sets. H. Kumar [**11**] introduced and studied some new functions called almost $(1, 2)^*$-η-continuous, almost $(1, 2)^*$-gη-continuous, almost $(1, 2)^*$-rgη-continuous, $(1, 2)^*$-η-closed, $(1, 2)^*$-gη-closed, $(1, 2)^*$-rgη-closed, almost $(1, 2)^*$-η-closed, and almost $(1, 2)^*$-rgη-closed functions in bitopological spaces and obtained some characterizations and preservation theorems for mildly $(1, 2)^*$-η-normal spaces. Recently, H. Kumar [**12**] introduced and studied $(1, 2)^*$-πgη-closed sets in bitopological spaces and obtained their properties.

2. PRELIMINARIES

Throughout the paper $(X, \Im_1, \Im_2)$, (Y, σ_1, σ_2) and $(Z, \wp_1, \wp_2)$ (or simply X, Y and Z) denote bitopological spaces.

Definition 2.1. Let S be a subset of X. Then S is said to be **$\Im_{1,2}$-open [16]** if $S = A \cup B$ where $A \in \Im_1$ and $B \in \Im_2$. The complement of a $\Im_{1,2}$-open set is **$\Im_{1,2}$-closed**.

Definition 2.2 [**16**]. Let S be a subset of X. Then
(i) the **$\Im_{1,2}$-closure** of S, denoted by $\Im_{1,2}$-cl(S), is defined as $\cap$ {F : S $\subset$ F and F is $\Im_{1,2}$-closed}; (ii) the **$\Im_{1,2}$-interior** of S, denoted by $\Im_{1,2}$-int(S), is defined as $\cup$ {F : F $\subset$ S and F is $\Im_{1,2}$-open}.

Note 2.3 [**16**]. Notice that $\Im_{1,2}$-open sets need not necessarily form a topology.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Definition 2.4. A subset A of a bitopological space $(X, \Im_1, \Im_2)$ is called
(i) regular (1, 2)*-open [**16**] if $A = \Im_{1,2}\text{-int}(\Im_{1,2}\text{-cl}((A))$.
(ii) (1, 2)*-π-open [**2**] if A is the finite union of $(1, 2)^*$-regular-open sets.
(iii) (1, 2)*-η-open [**9**] if $A \subset \Im_{1,2}\text{-int}(\Im_{1,2}\text{-cl}(\Im_{1,2}\text{-int})(A)) \cup \Im_{1,2}\text{-cl}(\Im_{1,2}\text{–int}(A))$.

The complement of a regular $(1, 2)^*$-open (resp. $(1, 2)^*$-π-open, $(1, 2)^*$-η-open) set is called **regular (1 , 2)*-closed** (resp. **(1, 2)*-π-closed**, **(1, 2)*-η-closed**).

The **(1, 2)*-η-closure** of a subset A of X is denoted by **(1, 2)*-η-cl(A)**, defined as the intersection of all $(1, 2)^*$-η-closed sets containing A. The **(1, 2)*-η-interior** of S, denoted by **(1, 2)*-η-int(S)**, is defined as $\cup \{F : F \subset S \text{ and } F \text{ is } (1, 2)^*\text{-η-open}\}$.

The family of all regular $(1, 2)^*$-open (resp. regular $(1, 2)^*$-closed, $(1, 2)^*$-η-open, $(1, 2)^*$-η-closed) sets in X is denoted by $(1, 2)^*$-RO(X) (resp. $(1, 2)^*$-RC(X), $(1, 2)^*$-η-O(X), $(1, 2)^*$-η-C(X)).

Remark 2.5. We have the following implications for the properties of subsets [**12**]:

regular $(1, 2)^*$-open $\Rightarrow$ $(1, 2)^*$-π-open $\Rightarrow$ $\Im_{1,2}$-open $\Rightarrow$ $(1, 2)^*$-η-open

Where none of the implications is reversible.

Definition 2.6. A subset A of a bitopological space $(X, \Im_1, \Im_2)$ is called
(i) (1, 2)*-generalized η-closed (briefly **(1, 2)*-gη-closed**) [**10**] if $(1, 2)^*$-η-cl(A) ⊂ U whenever A ⊂ U and U is $\Im_{1,2}$-open in X.
(ii) (1, 2)*- π generalized η-closed (briefly **(1, 2)*-πgη-closed [12]**) if $(1, 2)^*$-η-cl(A) ⊂ U whenever A ⊂ U and U is $(1, 2)^*$-π-open in X.

The complement of a $(1, 2)^*$-gη-closed (resp. $(1, 2)^*$-πgη-closed) set is called **(1, 2)*-gη-open** (resp. **(1, 2)*-πgη-open**).

We denote the set of all $(1, 2)^*$-πgη-closed (resp. $(1, 2)^*$-πgη-open) sets in $(X, \Im_1, \Im_2)$ by $(1, 2)^*$-**πgη-C(X)** (resp. **πgη-O(X)**).
Theorem 2.7. [12]. A set A is $(1, 2)^*$-πgη-open if and only if the following condition holds:
F ⊂ $(1, 2)^*$-η-int(A) whenever F is $(1, 2)^*$-π-closed and F ⊂ A.

3. (1, 2)*-QUASI η-NORMAL SPACES IN BITOPOLOGICAL SPACES

In this section, we introduce $(1, 2)^*$-quasi η-normal spaces in bitopological spaces and study some basic properties of $(1, 2)^*$-quasi η-normal spaces.

Definition 3.1. A space X is said to be **(1, 2)*-η-normal [11]** (resp. **(1, 2)*-normal, (1, 2)*-α-normal [3])** if for every pair of disjoint $\Im_{1,2}$-closed sets H and K, there exist disjoint $(1, 2)^*$-η-open (resp. $\Im_{1,2}$-open, $(1, 2)^*$-α-open) sets U, V of X such that H ⊂ U and K ⊂ V.

Definition 3.2. A space X is said to be **(1, 2)*-quasi η-normal** (resp. **(1, 2)*-quasi normal**, **(1, 2)*-quasi α-normal [2]**) if for every pair of disjoint $(1, 2)^*$-π-closed H, K of X, there exist disjoint $(1, 2)^*$-η-open (resp. $\Im_{1,2}$-open, $(1, 2)^*$-α-open) sets U, V of X such that H ⊂ U and K ⊂ V

Definition 3.3. A space X is said to be **mildly (1, 2)*-η-normal** [**11**] (resp. **mildly (1, 2)*-normal** [**6**] **mildly (1, 2)*-α-normal**) if for every pair of disjoint H, K ∈ $(1, 2)^*$-RC(X), there exist disjoint $(1, 2)^*$-η-open (resp. $\Im_{1,2}$-open, $(1, 2)^*$-α-open) sets U, V of X such that H ⊂ U and K ⊂ V.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Remark 3.4. From the definitions stated above, we obtain the following diagram.

$(1, 2)^*$-normal $\Rightarrow$ $(1, 2)^*$-quasi normal $\Rightarrow$ mildly $(1, 2)^*$-normal

$\Downarrow$ $\Downarrow$ $\Downarrow$

$(1, 2)^*$-α-normal $\Rightarrow$ $(1, 2)^*$-quasi α-normal $\Rightarrow$ mildly $(1, 2)^*$-α-normal

$\Downarrow$ $\Downarrow$ $\Downarrow$

$(1, 2)^*$-η-normal $\Rightarrow$ $(1, 2)^*$-quasi η-normal $\Rightarrow$ mildly $(1, 2)^*$-η-normal

Where none of the implications is reversible as can be seen from the following example:
Example 3.5. Let $X = \{a, b, c, d\}$ with $\Im_1 = \{\phi, X, \{a\}, \{b\}, \{a, b\}, \{b, c, d\}\}$ and $\Im_2 = \{\phi, X, \{c\}, \{a, c, d\}\}$. Then the pair of disjoint regular $(1, 2)^*$-closed sets $H = \{a\}$ and $K = \{c, d\}$, there exist disjoint $(1, 2)^*$-η-open sets $U = \{a\}$ and $V = \{c, d\}$ such that $H \subset U$ and $K \subset V$. Hence $(X, \Im_1, \Im_2)$ is mildly $(1, 2)^*$-η-normal but not mildly $(1, 2)^*$-normal, since $V = \{c, d\}$ is not $\Im_{1,2}$-open set.

Example 3.6. Let $X = \{a, b, c\}$ with $\Im_1 = \{\phi, X, \{a\}, \{a, c\}\}$ and $\Im_2 = \{\phi, X, \{c\}\}$. Then the pair of disjoint $(1, 2)^*$-π-closed sets $H = \phi$ and $K = \{b\}$, there exist disjoint $(1, 2)^*$-η-open sets $U = \{a\}$ and $V = \{b, c\}$ such that $H \subset U$ and $K \subset V$. Hence $(X, \Im_1, \Im_2)$ is $(1, 2)^*$-quasi η-normal but it is neither $(1, 2)^*$-quasi normal nor $(1, 2)^*$-quasi α-normal, since $V = \{b, c\}$ is neither $\Im_{1,2}$-open nor $(1, 2)^*$-α-open set.

Example 3.7. Let $X = \{a, b, c\}$ with $\Im_1 = \{\phi, X, \{a\}\}$ and $\Im_2 = \{\phi, X, \{b\}, \{a, b\}\}$. Then the pair of disjoint $(1, 2)^*$-π-closed sets $H = \phi$ and $K = \{c\}$, there exist disjoint $(1, 2)^*$-η-open sets $U = \{b\}$ and $V = \{a, c\}$ such that $H \subset U$ and $K \subset V$. Hence $(X, \Im_1, \Im_2)$ is $(1, 2)^*$-quasi η-normal but it is neither $(1, 2)^*$-quasi normal nor $(1, 2)^*$-quasi α-normal, since $V = \{b, c\}$ is neither $\Im_{1,2}$-open nor $(1, 2)^*$-α-open set.

Theorem 3.8. For a space X, the following are equivalent:
(a) X is $(1, 2)^*$-quasi η-normal.
(b) For every pair of $(1, 2)^*$-π-open subsets U and V of X whose union is X, there exist $(1, 2)^*$-η-closed subsets G and H of X such that $G \subset U$, $H \subset V$ and $G \cup H = X$.
(c) For any $(1, 2)^*$-π-closed set A and every π-open set B in X such that $A \subset B$, there exists a $(1, 2)^*$-η-open subset U of X such that $A \subset U \subset (1, 2)^*$-$\eta$-cl(U) $\subset B$.
(d) For every pair of disjoint $(1, 2)^*$-π-closed subsets A and B of X, there exist $(1, 2)^*$-η-open subsets U and V of X such that $A \subset U$, $B \subset V$ and $(1, 2)^*$-η-cl(U) $\cap$ $(1, 2)^*$-η-cl(V) = ϕ.
Proof. (a) $\Rightarrow$ (b), (b) $\Rightarrow$ (c), (c) $\Rightarrow$ (d) and (d) $\Rightarrow$ (a).

(a) $\Rightarrow$ (b). Let U and V be any $(1, 2)^*$-π-open subsets of a $(1, 2)^*$-quasi η-normal space X such that $U \cup V = X$. Then, $X - U$ and $X - V$ are disjoint $(1, 2)^*$-π-closed subsets of X. By $(1, 2)^*$-quasi η-normality of X, there exist disjoint $(1, 2)^*$-η-open subsets U_1 and V_1 of X such that $X - U \subset U_1$ and $X - V \subset V_1$. Let $G = X - U_1$ and $H = X - V_1$. Then, G and H are $(1, 2)^*$-η-closed subsets of X such that $G \subset U$, $H \subset V$ and $G \cup H = X$.

(b) $\Rightarrow$ (c). Let A be a $(1, 2)^*$-π-closed and B is a $(1, 2)^*$-π-open subsets of X such that $A \subset B$. Then, $X - A$ and B are $(1, 2)^*$-π-open subsets of X such that $(X - A) \cup B = X$. Then, by part (b), there exist $(1, 2)^*$-η-closed sets G and H of X such that $G \subset (X - A)$, $H \subset B$ and $G \cup H = X$. Then, $A \subset (X - G)$, $(X - B) \subset (X - H)$ and $(X - G) \cap (X - H) = \phi$. Let $U = X - G$ and $V = (X - H)$. Then U and V are disjoint $(1, 2)^*$-η-open sets such that $A \subset U \subset X - V \subset B$. Since $X - V$ is $(1, 2)^*$-η-closed, then we have $(1, 2)^*$-η-cl(U) $\subset (X - V)$. Thus, $A \subset U \subset (1, 2)^*$-$\eta$-cl(U) $\subset B$.

(c) $\Rightarrow$ (d). Let A and B be any disjoint $(1, 2)^*$-π-closed subset of X. Then $A \subset X - B$, where $X - B$ is π-open. By the part (c), there exists a $(1, 2)^*$-η-open subset U of X such that $A \subset U \subset$ $(1, 2)^*$-η-cl(U) $\subset X - B$. Let $V = X - (1, 2)^*$-η-cl(U). Then, V is a $(1, 2)^*$-η-open subset of X. Thus, we obtain $A \subset U$, $B \subset V$ and $(1, 2)^*$-η-cl(U) $\cap$ $(1, 2)^*$-η-cl(V) = ϕ.

(d) $\Rightarrow$ (a). It is obvious.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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The following result is useful for giving some other characterization of $(1, 2)^*$-quasi η-normal spaces.

Theorem 3.9. For a space X, the following are equivalent:
(a) X is $(1, 2)^*$-quasi η-normal.
(b) For any disjoint $(1, 2)^*$-π-closed sets H and K, there exist disjoint $(1, 2)^*$-gη-open sets U and V such that $H \subset U$ and $K \subset V$
(c) For any disjoint $(1, 2)^*$-π-closed sets H and K, there exist disjoint $(1, 2)^*$-πgη-open sets U and V such that $H \subset U$ and $K \subset V$.
(d) For any $(1, 2)^*$-π-closed set H and any $(1, 2)^*$-π-open set V containing H, there exists a $(1, 2)^*$-gη-open set U of X such that $H \subset U \subset (1, 2)^*$-η-cl(U) $\subset V$.
(e) For any $(1, 2)^*$-π-closed set H and any $(1, 2)^*$-π-open set V containing H, there exists a $(1, 2)^*$-πgη-open set U of X such that $H \subset U \subset (1, 2)^*$-η-cl(U) $\subset V$.
Proof. (a) ⇒ (b), (b) ⇒ (c), (c) ⇒ (d), (d) ⇒ (e) and (e) ⇒ (a).
(a) ⇒ (b). Let X be $(1, 2)^*$-quasi η-normal space. Let H, K be disjoint $(1, 2)^*$-π-closed sets of X. By assumption, there exist disjoint $(1, 2)^*$-η-open sets U, V such that $H \subset U$ and $K \subset V$. Since every $(1, 2)^*$-η-open set is $(1, 2)^*$-gη-open, so U and V are $(1, 2)^*$-gη-open sets such that $H \subset U$ and $K \subset V$.

(b) ⇒ (c). Let H, K be two disjoint $(1, 2)^*$-π-closed sets. By assumption, there exist disjoint $(1, 2)^*$-gη-open sets U and V such that $H \subset U$ and $K \subset V$. Since $(1, 2)^*$-gη-open set is $(1, 2)^*$-πgη-open, so U and V are $(1, 2)^*$-πgη-open sets such that $H \subset U$ and $K \subset V$.

(c) ⇒ (d). Let H be any $(1, 2)^*$-π-closed set and V be any $(1, 2)^*$-π-open set containing H. By assumption, there exist disjoint $(1, 2)^*$-πgη-open sets U and W such that $H \subset U$ and $X - V \subset W$. By **Theorem 2.7**, we get $X - V \subset (1, 2)^*$-η-int(W) and $(1, 2)^*$-η-cl(U) ∩ $(1, 2)^*$-η-int (W) = ϕ. Hence $H \subset U \subset (1, 2)^*$-η-cl(U) $\subset X - (1, 2)^*$-η-int(W) $\subset V$.

(d) ⇒ (e). Let H be any $(1, 2)^*$-π-closed set and V be any $(1, 2)^*$-π-open set containing H. By assumption, there exist $(1, 2)^*$-gη-open set U of X such that $H \subset U \subset (1, 2)^*$-η-cl(U) $\subset V$. Since, every $(1, 2)^*$-gη-open set is $(1, 2)^*$-πgη-open, there exists $(1, 2)^*$-πgη-open sets U of X such that $H \subset U \subset (1, 2)^*$-η-cl(U) $\subset V$.

(e) ⇒ (a). Let H, K be any two disjoint $(1, 2)^*$-π-closed sets of X. Then $H \subset X - K$ and X – K is π-open. By assumption, there exists $(1, 2)^*$-πgη-open set G of X such that $H \subset G \subset (1, 2)^*$-η-cl(G) $\subset X - K$. Put U = $(1, 2)^*$-η-int(G), V = X – $(1, 2)^*$-η-cl(G). Then U and V are disjoint $(1, 2)^*$-η-open sets of X such that $H \subset U$ and $K \subset V$.

4. PRESERVATION THEOREMS

In this section, we shall recall the definitions of some functions used in the sequel. Further we introduce some $(1, 2)^*$-πgη-closed and almost $(1, 2)^*$-πgη-closed functions in bitopological spaces.

Definition 4.1. A function $f : X \to Y$ is said to be
(i) (1, 2)*-η-continuous [**11**] if $f^{-1}(F)$ is $(1, 2)^*$-η-closed in X for every $\Im_{1,2}$-closed set F of Y;
(ii) (1, 2)*-πgη-continuous [**12**] if $f^{-1}(F)$ is $(1, 2)^*$-πgη-closed in X for every $\Im_{1,2}$-closed set F of Y;
(iii) (1, 2)*-π-continuous [**2**] if $f^{-1}(F)$ is $(1, 2)^*$-π-closed in X for every $\Im_{1,2}$-closed set F of Y;

Definition 4.2. A function $f : X \to Y$ is said to be
(i) almost (1, 2)*-continuous [**6**] if $f^{-1}(F)$ is $\Im_{1,2}$-open in X for every $F \in (1, 2)^*$-RO(Y);
(ii) almost (1, 2)*-π-continuous [**2**] if $f^{-1}(F)$ is $(1, 2)^*$-π-closed in X for every $F \in (1, 2)^*$-RC(Y);
(iii) almost (1, 2)*-πgη-continuous [**12**] if $f^{-1}(F)$ is $(1, 2)^*$-πgη-closed in X for every $F \in (1, 2)^*$-RC(Y);

Definition 4.3. A function $f : X \to Y$ is said to be
(i) regular (1, 2)*-closed [6] if f(F) is regular $(1, 2)^*$-closed in Y for every $\Im_{1,2}$-closed set F of X;
(ii) (1, 2)*-η-closed [**11**] if f(F) is $(1, 2)^*$-η-closed in Y for every $\Im_{1,2}$-closed set F of X;
(iii) (1, 2)*-gη-closed [**11**] if f(F) is $(1, 2)^*$-gη-closed in Y for every $\Im_{1,2}$-closed set F of X;
(iv) (1, 2)*-πgη-closed if f(F) is $(1, 2)^*$-πgη-closed in Y for every $\Im_{1,2}$-closed set F of X.

Definition 4.4. A function $f : X \to Y$ is said to be
(i) (1, 2)*-rc-preserving [**6**] if f(F) is regular $(1, 2)^*$-closed in Y for every $F \in (1, 2)^*$-RC(X);
(ii) almost (1, 2)*-closed [**11**] if f(F) is $\psi_{1,2}$-closed in Y for every $F \in (1, 2)^*$-RC(X);

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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(iii) almost (1, 2)*- η-closed [**11**] if f(F) is (1, 2)*-η-closed in Y for every F ∈ (1, 2)*-RC(X);
(iv) almost (1, 2)*-gη-closed [**11**] if f(F) is (1, 2)*-gη-closed in Y for every F ∈ (1, 2)*-RC(X);
(v) almost (1, 2)*-πgη-closed if f(F) is (1, 2)*-πgη-closed in Y for every F ∈ (1, 2)*-RC(X);

Remark 4.5. From the definitions stated above, we obtain the following diagram.

regular (1, 2)*-closed	⇒	(1, 2)*-rc-preserving
⇓		⇓
(1, 2)*-closed	⇒	almost (1, 2)*-closed
⇓		⇓
(1, 2)*-η-closed	⇒	almost (1, 2)*-η-closed
⇓		⇓
(1, 2)*-gη-closed	⇒	almost (1, 2)*-gη-closed
⇓		⇓
(1, 2)*-πgη-closed	⇒	almost (1, 2)*-πgη-closed

The following examples enable us to realize that none of the implications in the above diagram is reversible.

Example 4.6. Let X = Y = {a, b, c}, $\Im_1$ = {ϕ, X, {a}}, $\Im_2$ = {ϕ, X, {b}}, ψ_1 = {ϕ, Y, {a, b}} and ψ_2 = {ϕ, Y, {a}}. Define f : X → Y as f(a) = b; f(b) = a; f(c) = c. Clearly f is (1, 2)*-gη-closed as well as almost (1, 2)*-gη-closed. It is also almost (1, 2)*-πgη-closed. But it is neither (1, 2)*-closed nor almost (1, 2)*-closed. It is neither (1, 2)*-η-closed nor almost (1, 2)*-η-closed.

Example 4.7. Let X = Y = {a, b, c}, $\Im_1$ = {ϕ, X, {a}}, $\Im_2$ = {ϕ, X, {b}}, ψ_1 = {ϕ, Y, {a, b}} and ψ_2 = {ϕ, Y, {a}}. Define f : X → Y as f(a) = b, f(b) = c, f(c) = a. But it is neither (1, 2)*-η-closed nor almost (1, 2)*-η-closed. It is neither (1, 2)*-gη-closed nor almost (1, 2)*-gη-closed.

Example 4.8. Let X = Y = {a, b, c}, $\Im_1$ = {ϕ, X, {a}}, $\Im_2$ = {ϕ, X, {a, c}}, ψ_1 = {ϕ, Y, {a, b}} and ψ_2 = {ϕ, Y, {a}}. Define f : X → Y as f(a) = b; f(b) = a; f(c) = c. Clearly f is almost (1, 2)*-closed as well as almost (1, 2)*-gη-closed, but it is not (1, 2)*-closed. It is also almost (1, 2)*-πgη-closed

Example 4.9. Let X = Y = {a, b, c}, $\Im_1$ = {ϕ, X, {a}}, $\Im_2$ = {ϕ, X, {b}}, ψ_1 = {ϕ, Y, {b}, {c}, {b, c}} and ψ_2 = {ϕ, Y, {a, b}}. Define f : X → Y as f(a) = c, f(b) = b, f(c) = a. Clearly f is (1, 2)*-closed as well as almost (1, 2)*-closed. It is (1, 2)*-η-closed as well as almost (1, 2)*-gη-closed. But it is neither regular (1, 2)*-closed nor (1, 2)*-rc-preserving.

Example 4.10. Let X = Y = {a, b, c}, $\Im_1$ = {ϕ, X, {a}}, $\Im_2$ = {ϕ, X, {b}}, ψ_1 = {ϕ, Y, {a}, {a, c}} and ψ_2 = {ϕ, Y, {c}}. Define f : X → Y as f(a) = a; f(b) = c; f(c) = b. Clearly f is (1, 2)*-rc-preserving as well as almost (1, 2)*-η-closed.

Theorem 4.11. If f : X → Y is an almost (1, 2)*-π-continuous and (1, 2)*-πgη-closed function, then f(A) is (1, 2)*-πgη-closed in Y for every (1, 2)*-πgη-closed set A of X.
Proof. Let A be any (1, 2)*-πgη-closed set of X and V be any (1, 2)*-π-open set of Y containing f(A). Since f is almost (1, 2)*-π-continuous, f^{-1}(V) is (1, 2)*-π-open in X and A ⊂ f^{-1}(V). Therefore, we have (1, 2)*-η-cl(A) ⊂ f^{-1}(V) and hence f((1, 2)*-η-cl(A)) ⊂ V. Since f is (1, 2)*-πgη-closed, f((1, 2)*-η-cl(A)) is (1, 2)*-πgη-closed in Y and hence we obtain (1, 2)*-η-cl(f(A)) ⊂ (1, 2)*-η-cl(f((1, 2)*-η-cl(A))) ⊂ V. Hence f(A) is (1, 2)*-πgη-closed in Y.

Theorem 4.12. A surjection f : X → Y is almost (1, 2)*-πgη-closed if and only if for each subset S of Y and each U ∈ (1, 2)*-RO(X) containing f^{-1}(S), there exists a (1, 2)*-πgη-open set V of Y such that S ⊂ V and f^{-1}(V) ⊂ U.
Proof. Necessity. Suppose that f is almost (1, 2)*-πgη-closed. Let S be a subset of Y and U ∈ (1, 2)*-RO(X) containing f^{-1}(S). If V = Y − f (X − U), then V is a (1, 2)*-πgη-open set of Y such that S ⊂ V and f^{-1}(V) ⊂ U.

Sufficiency. Let F be any regular (1, 2)*-closed set of X. Then f^{-1}(Y − f(F)) ⊂ (X − F) and (X − F) ∈ (1, 2)*-RO(X). There exists a (1, 2)*-πgη-open set V of Y such that Y − f(F) ⊂ V and f^{-1}(V) ⊂ (X − F). Therefore, we have f(F) ⊃ (Y − V) and F ⊂ X − f^{-1}(V) ⊂ f^{-1} (Y − V) . Hence we obtain f(F) = Y − V and f(F) is (1, 2)*-πgη-closed in Y, which shows that f is almost (1, 2)*-πgη-closed.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
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Theorem 4.13. If f : X → Y is an almost $(1, 2)^*$-πgη-continuous, $(1, 2)^*$-rc-preserving injection and Y is $(1, 2)^*$-quasi η-normal then X is $(1, 2)^*$-quasi η-normal.
Proof. Let A and B be any disjoint $(1, 2)^*$-π-closed sets of X. Since f is a $(1, 2)^*$-rc-preserving injection, f(A) and f(B) are disjoint $(1, 2)^*$-π-closed sets of Y. Since Y is $(1, 2)^*$-quasi η-normal, there exist disjoint $(1, 2)^*$-η-open sets U and V of Y such that f(A) ⊂ U and f(B) ⊂ V.

Now if G = $(1, 2)^*$-int($(1, 2)^*$-cl(U)) and H = $(1, 2)^*$-int($(1, 2)^*$-cl(V)). Then G and H are regular $(1, 2)^*$-open sets such that f(A) ⊂ G and f(B) ⊂ H. Since f is almost $(1, 2)^*$-πgη-continuous, $f^{-1}(G)$ and $f^{-1}(H)$ are disjoint $(1, 2)^*$-πgη-open sets containing A and B which shows that X is $(1, 2)^*$-quasi η-normal.

Theorem 4.14. If f : X → Y is $(1, 2)^*$-π-continuous, almost $(1, 2)^*$-η-closed surjection and X is $(1, 2)^*$-quasi η-normal space then Y is $(1, 2)^*$-η-normal.
Proof. Let A and B be any two disjoint closed sets of Y. Then $f^{-1}(A)$ and $f^{-1}(B)$ are disjoint $(1, 2)^*$-π-closed sets of X. Since X is quasi $(1, 2)^*$-η-normal, there exist disjoint $(1, 2)^*$-η-open sets U and V such that $f^{-1}(A) \subset U$ and $f^{-1}(B) \subset V$.

Let G = $(1, 2)^*$-int($(1, 2)^*$-cl(U)) and H = $(1, 2)^*$-int($(1, 2)^*$-cl(V)). Then G and H are disjoint regular $(1, 2)^*$-open sets of X such that $f^{-1}(A) \subset G$ and $f^{-1}(B) \subset H$. Now, we set K = Y − f(X − G) and L = Y − f (X − H). Then K and L are $(1, 2)^*$-η-open sets of Y such that A ⊂ K, B ⊂ L, $f^{-1}(K) \subset G$ and $f^{-1}(L) \subset H$. Since G and H are disjoint, K and L are disjoint. Since K and L are $(1, 2)^*$-η-open and we obtain A ⊂ $(1, 2)^*$-η-int(K), B ⊂ $(1, 2)^*$-η-int(L) and $(1, 2)^*$-η-int(K) ∩ $(1, 2)^*$-η-int(L) = ϕ. Therefore, Y is $(1, 2)^*$-η-normal.

Theorem 4.15. Let f : X → Y be an almost $(1, 2)^*$-π-continuous and almost $(1, 2)^*$-πgη-closed surjection. If X is $(1, 2)^*$-quasi η-normal space then Y is $(1, 2)^*$-quasi η-normal.
Proof. Let A and B be any disjoint $(1, 2)^*$-π-closed sets of Y. Since f is almost $(1, 2)^*$-π-continuous, $f^{-1}(A)$ and $f^{-1}(B)$ are disjoint $(1, 2)^*$-π-closed sets of X. Since X is $(1, 2)^*$-quasi η-normal, there exist disjoint $(1, 2)^*$-η-open sets U and V of X such that $f^{-1}(A) \subset U$ and $f^{-1}(B) \subset V$.

Put G = $(1, 2)^*$-int($(1, 2)^*$-cl(U)) and H = $(1, 2)^*$-int($(1, 2)^*$-cl(V)). Then G and H are disjoint regular $(1, 2)^*$-open sets of X such that $f^{-1}(A) \subset G$ and $f^{-1}(B) \subset H$. By **Theorem 4.12,** there exist $(1, 2)^*$-gη-open sets K and L of Y such that A ⊂ K, B ⊂ L, $f^{-1}(K) \subset G$ and $f^{-1}(L) \subset H$. Since G and H are disjoint, so are K and L by **Theorem 2.7,** A ⊂ $(1, 2)^*$-η-int(K), B ⊂ $(1, 2)^*$-η-int(L) and $(1, 2)^*$-η-int(K) ∩ $(1, 2)^*$-η-int(L) = ϕ. Therefore, Y is $(1, 2)^*$-quasi η-normal.

Corollary 4.16. If f : X → Y is an almost $(1, 2)^*$-continuous and almost $(1, 2)^*$-closed surjection and X is a $(1, 2)^*$-normal space, then Y is $(1, 2)^*$-quasi η-normal.
Proof. Since every almost $(1, 2)^*$-closed function is almost $(1, 2)^*$-πgη-closed by **Theorem 4.15,** Y is $(1, 2)^*$-quasi η-normal.

5. CONCLUSION

In this paper, we introduce a new class of normal space called, $(1, 2)^*$-quasi η-normal space. The relationships among $(1, 2)^*$-normal, $(1, 2)^*$-quasi η-normal, mildly $(1, 2)^*$-normal, $(1, 2)^*$-quasi α-normal, $(1, 2)^*$-mildly α-normal, $(1, 2)^*$-α-normal and mildly $(1, 2)^*$-η-normal spaces are investigated. Moreover, we introduce some functions such as $(1, 2)^*$-η-closed, $(1, 2)^*$-gη-closed, $(1, 2)^*$-πgη-closed, almost $(1, 2)^*$-η-closed, almost $(1, 2)^*$-gη-closed and almost $(1, 2)^*$-πgη-closed. Utilizing $(1, 2)^*$-πgη-closed sets and some functions, we obtain some characterizations and preservation theorems for $(1, 2)^*$-quasi η-normal spaces. This idea can be extended to ordered topological, ordered bitopological and fuzzy topological spaces etc.

Acknowledgements. I am heartily thankful to Dr M. C. Sharma, Department of Mathematics, N. R. E. C. College, Khurja, Uttar Pradesh (India) for his encouragement and support during the preparation of this paper.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

CHARAKOKTA CURRICULUM VITAE FOR TRIVIDHA JYANOPAYA

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ABSTRACT

Ayurveda Shastra is being considered as Amrutha for its infinite contribution to the Humanity in the field of Medicine.To understand any Shastra one should have a tool called Jyana.One is able to understand the depth of the Shastra,when they begin to study the shashtra mainly,the first and foremost thing one should do is to study ,should know how to study and after that how it should be implementated and utilized.Acharya Charaka vividly expressed in Vimana stana the essential folds to pursue the knowledge by Trividha jyanopaya viz - Adhyana,Adyapana,Tadvidda sambhasha i.e.,methodology of Learning ,Teaching and Disscusion which are essential. These trividha upaya are so precious just like the pearls of the ocean called Jyana.so when these three upayas are followed then one can have the fruit called Jyana undeniably.On that account its cardinal to have knowledge about the trividha jyanopayas this study attempts to know three folds of obtaining knowledge.

INTRODUCTION

Humanity has been toiling hard behind information / Data i.e., Knowledge, since from the dawn of human civilisation. One should Acknowledge, be Thankfull and pay utmost Gratitude to our ancient Maharsi Acharya Charaka for his monumental efforts, strenuous trails, risky adventures, serious contemplations and commitments towards the pursuits of knowledge concerned to Life Science – Ayurveda. His unique contribution in and among the Ayurvedic feternity the" Vimanastana" (the section on Specific measures), especially "Roga Bhishakjitiya Ahyaya", more especially the "Trividha jnanopayas".
Acharya charaka proposed a systematized ideal curriculum of Learning methodology as - "Trividha jnanopayas" viz.,

1) Adhyayana (Studing / Learning)
2) Adhyaapana(Teaching)
3) Sambhasha vidhi (Discussion or samvaada)

AIMS AND OBJECTIVES

- To study about the Charakokta Trividha jyanapayas.
- To understand the concept Trividha jyanopays.

MATERIALS AND METHODS

A litrary survey is done mainly on charaka Samhita Vimana stana ,the data is collected from other sources and Ayurvedic texts,contemporary texts.Mainly used book in the studies are Charaka Samhita and its available commentaries.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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LITERATURE REVIEW

Acharya charaka in the 8th Adhyaya of Vimanasthana of Charaka samhita "Roga bhishakjitiya adhyaya " is honored as Koshagaara (store house), concerned to the whole of the Charaka samhita, [x] where charakacharya's proposed some three steps for ideal Learning or the Learning methodology the Trividha Jnanopayas viz.,

1) Adhyayana (Studing / Learning)
2) Adhyaapana(Teaching)
3) Sambhasha vidhi (Discussion or samvaada)

1) Adhyayana (Studing / Learning) [2]:

Adyayanam- kli- (अधि + इङ् + भावे ल्युट् ।) गुरुमुखादानुपूर्ब्बीश्रवणं । पठनं । Adyayana is referred to as (studies) - hearing to the words of the Guru (the teacher) or reading the texts.

Sir Monier Monier William Sankrit-English Dictionary mentioned - **Adhyayana**: (n) reading, studying, especially the Vedas, the religious merit acquired by studying.

Here in the present context Adyayana is implied for studying or reading or enchanting the Slokas.

One having Swaastya – sound state of health and Krutakshana waiting for the exact moment, should leave aside all the other works, should get up in the morning - Pratahkaala or Upayusha kaala – a little earlier at night,should perform routine Shoucha karma, thence Snana, Sandhyavandana,Achamana, oblution should bow down – Namaskaara i.e. prayers to devataas, Rushis, Gou, Brahmana, Guru, Vrudha,Sidha and Acharyaas, then should sit in a comfortable posture on an even and hygienic ground, with due concentration of mind recite the Ayurveda sutras with clear voice attentively, repeating them again and again, meanwhile simultaneously also knowing his own doshaas and lacunas, which are to be rectified and get the in depth of knowledge . In this way one should study – Adhyayana of Ayurveda sutras, without wasting any kaala irrespective of time either at Madhyana, saayankaala and Ratri kala.

2) Adhyaapana(Teaching)[3]

Shadba kalpadruma mentioned – **Adyapanam- kli- अधि + इङ् + णिच् + भावे ल्युट् ।) पाठनं । विद्यादानं ||**

Adyapana is reading (of texts)and teaching i.e.Vidya- daana (donating the vidya) .

Sir Monier Monier William Sankrit-English Dictionary mentioned -

Adhyapana, as instruction, lecturing.

Here Adhyapana is referred to teaching, instructing about the science and its related procedures. Inbrief expressing the subject that was being learnt or Studied.

3) Tadvidha sambhasha (Discussion)[4]**:**

According to Shadba kalpadruma mentioned – **Sambhashanam -stri-(सं + भाष + ल्युट् ।) कथनम् । आलापनम् || Sambhasha-stre -(सं + भाष + अङ् । टाप् ।) सम्भाषणम् ॥ सं + धा + ल्युः । सन्दधातीति ॥** The word Sambhasha is formed by Sam + Bhasha Which means speaking together or joining (in conversation). According to Sir Monier Monier William Sankrit-English Dictionary - **Sambhasha**, to speak together, address, converse with, to join in a conversation, to talk over, discourse, talk, conversation with .

According to Acharya Charaka – **"भिषक् भिषजा सह संभाषेत ॥ ".** Acharya charaka Advocates the word Sam-bhasa is to express to speak together or a process of conversation between two Bhishaks about the specialty - Ayurveda.

Herein, the Sambhasha vidhi is comprises of

i) Jalpa: Discussion aimed for the up gradation of knowledge by sharing and exchanging the views [5]

ii) Vitandaa: Discussion aimed to put forth the difference of opinions' or views and thereby ways for defending one's views or getting forward for an invincible debates[6].

NEED AND SCOPE OF TRIVIDHA JYANOPAYA

- To eshtablish own theory by evidence base data.
- For critical analysis of the previous works.
- For the eshtabishment of new idiea / research work.

DISCUSSION

Acharya Charaka have written most appropriate and the complete encyclopedia of Learning Methodology of all the times.The same thing is explained in Brihadaranyaka Upanishad viz Drushtavya,Shrotavya,Manthavya,Nidhidhyaasana.The Trividha jyanopayas can be contemplated -The Adhyana can be taken as Primary educational skill development where basics of reading is explained,While the Adhyaapana can be considered as Secondary educational skill development, where method of teaching and

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 1 | January 2023 - Peer Reviewed Journal

understanding the rules and regulations of learning and teaching is explained.Eventually Tadvidha sambhasha can be visualized as Higher educational skill development, where post Reading,learning and understanding one should prepare himself to face the Discussions like Conferences,Debate,Seminar,Skull session and meeting where exchange of the knowledge takes places.

Bru. Upanishad		Charaka Samhita
1) Drushtavya, shrotavya	=	Adhyayana
2) Manthavya	=	Adhyaapana
3) Nidhidhyaasana	=	Tadvidha Sambhasha

CONCLUSSION

- To have a treasure called knowledge one has to dive deeper into the sea called Education.The process of learning i.e., Trividha jyanopayas are just hidden like the pearls in the shell which be obtained only after a definite manner of collection.
- The study and critical analysis of charakokta Jyanopaya suggests: Adhyayana can be concluded as employment of primary education and its allied skills,in one's primary academic hearing course through hearing and reading.
- Adhyapana can be concluded as deployment of teaching or expression of learnt subject after proper and appropriate Adhyayana that to after churring into the subject.
- Tadvidha sambhasha can be concluded as upgrading of existing knowledge,by improving debetic activities through attaing Parishads.
- Thus Charakokta Trividha Jyanopayas can be claimed with the conclusion,as a Guide and tutorial-Encyclopedia for learning methodology for all the times.

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