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Research article

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FDI INFLOWS INTO TOURISM INDUSTRY IN INDIA: A STEP TOWARDS ATMANIRBHAR BHARAT

Ganaraja K [1], Dhanya Prabhu [2] & Bhavya Rai [3]

Abstract

Indian Economy receives a considerable amount of revenue from tourism industry. The vast natural heritage and huge history have contributed to Indian tourism to attract more and more tourists over the years. Gross Domestic Product (GDP), job market and Foreign Exchange market in India are being supported by the tourism sector. Foreign tourist arrival has helped the Indian tourism sector to perform well. The Foreign Direct Investment (FDI) inflows to this sector have increased drastically over the years and the service sector has been the highest recipient of FDI. The COVID-19 pandemic has hit hard the tourism sector due to restrictions on international arrivals and nationwide lockdown. Due to this, the FDI inflows and revenue generation have been affected. As FDI helps in the development of new and also existing popular destinations, there is more scope for growth of the tourism industry in the country and thereby moving towards Atmanirbhar Bharat. The current study focuses on the growth of FDI inflows to the Indian tourism industry over the years from 2016 to 2020 and its corresponding growth rate in terms of GDP to the Indian economy. This study is intended to examine the FDI inflows to the tourism industry of India over the years and to analyze the implications of FDI inflows on the growth of the tourism industry. The present study is based on secondary sources of data. Correlation technique has been used to find the relation between FDI inflows and proportion of tourism industry in the GDP. The study nullifies FDI's role in the development of tourism sector and its contribution to the GDP subsequently. If other factors like policy changes, tax regulations, and promotion of domestic tourism are made, collectively this would help in the positive growth and significant contribution to the GDP of the nation.

Keywords: FDI, Tourism, GDP, Atmanirbhar Bharat

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1. INTRODUCTION

India is a country with vibrant demography and tourist destinations. Even after being invaded and ruled by various invaders for centuries, the culture of India remains prosperous along with the new cultural aspects. From ancient times till date, Indian tourist sites have been attracting tourists both from abroad and domestically. With the mixture of rich cultural heritage, scenic beauty and architecture, India has mesmerized its visiting tourists. Tourism is one of the leading industries in the service sector and has been contributing significantly towards the national Gross Domestic Product (GDP) growth. Tourism not only attracts tourists but also provides a huge number of job opportunities in the country. The tourism sector is linked with the hospitality industry, and transportation. There is no doubt, the tourism sector is emerging as the powerhouse of economic growth of India. During normal times, the tourism sector was a significant contributor to GDP growth, foreign exchange earnings and employment (Economic Survey 2021-22). But the Covid-19 pandemic has had a debilitating impact on world travel and tourism everywhere, including India. The sector endured a slowdown in 2018 and 2019 before declining abruptly in 2020 resulting in a change of -74.9% in foreign tourist arrivals. FDI has been a boon to emerging economies which lack capital for developmental activities to take place. The Indian service sector has been the highest recipient of FDI inflows of which the tourism sector has a significant part in it. The Indian Prime Minister at the time of COVID-19 gave a clarion call to make India self-reliant i.e., Atmanirbhar. The tourism sector with the help of the FDI inflows, and various initiatives of the Ministry of tourism like PRASHAD, and Swadesh Darshan is moving towards self-reliance and has been a major contributor towards Atmanirbhar Bharat.

2. REVIEW OF LITERATURE

Kumar N. & Binoy (2017) explored the importance of the tourism sector for the development of India and found that tourim sector has positive effects on employment and balance of payments if its demand and supply chain are properly mobilised. Vedaprabha et. al. (2017) examined the association between foreign exchange reserves, earnings, arrival of tourist and growth of tourism sector and its impact on the GDP subsequently. Subbarao S. (2008) in his study found significant composition of tourism industry on GDP and its role in employment creation. Sharma A. et.al. (2012) examined the foreign direct investment (FDI) in the Indian tourism industry, its flow and its impact on the economy of India. Muthusamy A. & Aravindaraj K. (2019) reviewed the correlation between foreign investment and tourism and hotel industry of India. Mishra P.K. et.al. (2020) studied the association between tourism sector development, FDI inflows to the tourism sector and real economic development of India. Kumar S. & Gupta A. (2019) investigated trends and patterns of FDI inflows in this sector.

The studies revealed that expenditure by the government on Tourism and price level have an important role in influencing FDI inflows positively. Meantime the parameters like tourist arrivals, exchange rate, GDP have less significance on tourism industry when taken seperatly but have significant impact when taken together. However, no studies have been particularly done on the correlation between FDI inflows into the tourism industry and the GDP of India. In this context, this study is intended to examine the FDI inflows to the tourism industry of India over the years and to analyze the implications of FDI inflows on the progression of tourism sector.

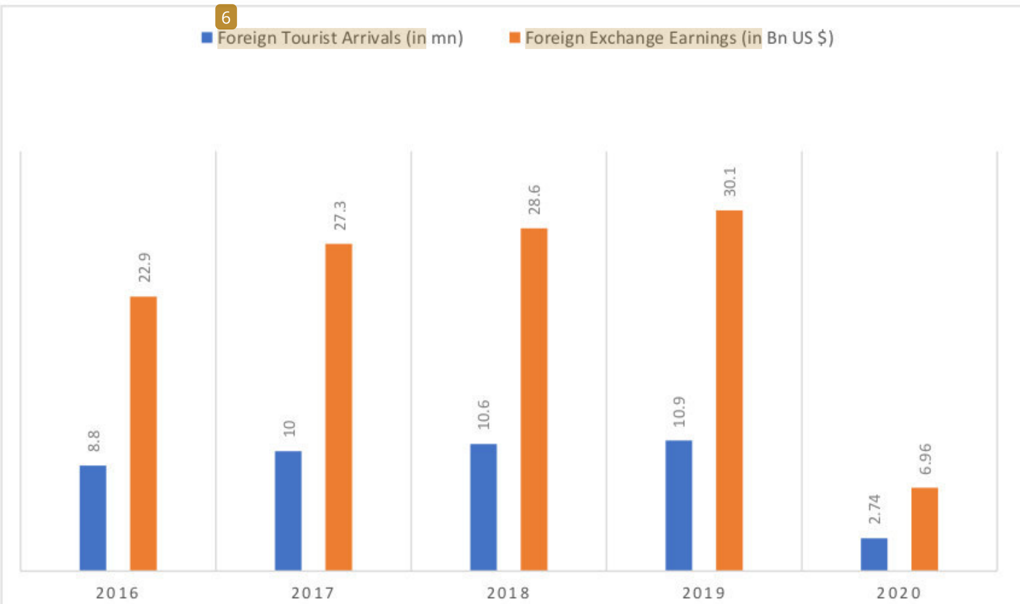
3. OBJECTIVES AND METHODOLOGY

Study wants to examine the FDI inflows to the Indian tourism industry over the years and to analyze the implications of FDI inflows on the growth of the tourism industry. The current study is based on secondary sources of information. The study is geographically restricted to India. Correlation technique has been used to find the relation between FDI inflows and the GDP contribution of the tourism industry.

4. DATA ANALYSIS AND DISCUSSION

The tourism sector has been a significant contributor to the Indian economy. The vast natural heritage and huge history have contributed to Indian tourism to attract more and more tourists over the years. Tourism being a subsector of the service sector has been supporting significantly to the GDP, employment and foreign exchange earnings. Foreign tourist arrival has helped the Indian tourism sector to perform well. The Foreign Direct Investment (FDI) inflows to this sector have increased drastically over the years and the service sector has been the highest recipient of FDI. The COVID-19 pandemic has hit hard the tourism sector due to restrictions on international arrivals and nationwide lockdown.

Figure 1: Tourist Arrivals and Exchange Earnings



Source: Ministry of Tourism, Economic Survey 2020- 21

Figure 1 shows the overseas tourist arrivals and the exchange earnings in India during 2016-20. The arrival of foreign tourists to India has been observed to be moving in increasing order from 2016 to 2019. Due to Covid- 19 pandemic and the cancellation of international flights, the numbers have fallen from 10.9 million in 2019 to 2.74 million in 2020.

Table 1: FDI inflows and GDP contribution from Tourism industry

YEAR	FDI INFLOWS (IN MN US $)	GDP CONTRIBUTION (IN BN US $)
2016	916	219.72
2017	1132	232.01
2018	1076	247.37
2019	2938	191.3
2020	369	121.9

Source: Department for Promotion of Industry and Internal Trade, GOI.

There is more scope for the development of tourism in our country. Table 1 presents the FDI inflows and the corresponding GDP contribution of the tourism industry. The data reveals that, in 2016, the FDI inflow was $ 916 million to which the corresponding GDP contribution was $ 219.72 billion. Up to 2019, the FDI inflows have risen steadily. However, the corresponding GDP contribution of the tourism industry has been increasing only till 2018. Amidst the impact of the pandemic, the FDI inflows increased significantly in 2019 but dropped down to 369 million in 2020. The impact of the pandemic is evident in the GDP contribution data. There has been a significant downfall in the contribution to GDP from $ 191.3 billion in 2019 and $ 129.1 billion in 2020.

To understand the association between FDI inflows and the contribution to GDP from the Tourism industry, correlation analysis has been undertaken. The correlation between the FDI inflows and GDP contribution from 2016 to 2020 is found to be 0.18. This shows a weak positive correlation between the two. This shows that an increase in the FDI inflows causes a minor change in the GDP contribution. If the FDI inflows are made to increase, that definitely would help in the enhancement of infrastructure in the tourism industry and thereby increase contribution to Indian GDP. Hence, FDI alone cannot bring significant changes in the growth of the tourism industry and the contribution to GDP. If other factors like policy changes, tax regulations, and promotion of domestic tourism are made, collectively this would help in the positive growth and substantial contribution to the GDP of the nation.

5. FINDINGS AND SUGGESTIONS

The Indian tourism industry has been attracting a greater number of FDI inflows every consequent year. The study finds that there has been a significant downfall in the contribution to GDP from $ 191.3 billion in 2019 and $ 129.1 billion in 2020. The Covid-19 pandemic has hit hard the revenue generation from the tourism industry and also the FDI inflows to the tourism industry. The weak positive correlation between the FDI inflows and the GDP contribution implies that FDI alone cannot bring significant changes in the development of the tourism industry and subsequently its contribution to the GDP. If other factors like policy changes, tax regulations, and promotion of domestic industry are made, collectively this would help in the positive growth and significant contribution to the GDP of the nation. Indigenous capital funding and promotional activities are to be boosted so that internal revenue generation would be possible. Safety and security, cleanliness should be given impetus which would help Indian tourism to be Atmanirbhar.

6. CONCLUSION

India is blessed with a maximum number of travel destinations. The culture, lifestyle, food habits, varied weather conditions, and ayurvedic medical practices make India attract more and more tourists both foreign and domestic. In this modern world, people are seeking spirituality, ancient traditions and peace of mind. It is high time now for India to utilize its true potential. All these aspects can be functional in increasing the contribution of the tourism industry to the national income of India. The Government of India is functional in attracting more and more

FDI towards the tourism industry. If the rate of FDI inflows would increase, and various other growth-promoting factors would come together, our Tourism can be Atmanirbhar.

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Digital Lending Practices of FinTech companies in India

by Author 987

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Digital Lending Practices of FinTech companies in India - An Empirical Study with Reference to Selected Online Platforms

Abstract:

The government of India in its Union Budget 2022 proposed to set up 75 Digital Banking Units (DBUs) in 75 Districts across India through Scheduled Commercial Banks which is seen as a major push for the growth of digital banking in India. These services offer a wide variety of conveniences on the one hand but on the other hand, inviting private players to lend loans through digital platforms that are illegal in India and affect the borrowers and society's well-being.This uneven growth needs a check at this hour and this study is conducted to ascertain the advancements in digital lending, examine the problems associated with digital banking, and the control mechanisms to be exercised on digital lending to ensure this development doesn't hamper the interest of the needy in India.

Key Words: Banking, Loan, Digital Lending, FinTech Companies, Convenience

1. Introduction

Banking services have become an integral part of every household in India and are proving to be vital for the progress of society economically. The initiatives like Jan Dhan Schemes, UPI Payments, Payments Banks, and Post Office Banks resulted in a banking revolution with increased transactions, Banking outlets, digital platforms, and financial portfolios. This uprising is visible from large-scale fully automated banking services through the internet, mobile phones, and gadgets and its acceptance among the masses. Due to the economic stress created by the Covid-19 pandemic, technology-enabled digital transformation has played a pivotal role in enabling individuals to carry out financial services anytime, anywhere[1]. As a result, the GOI in its Union Budget 2022 proposed to set up 75 Digital Banking Units (DBUs) in 75 Districts across India through Scheduled Commercial Banks which will prove a major push for digital banking in India. These digital services provide a wide variety of conveniences,but lending loans through digital platforms that are illegal in India can affect the borrowers and society's well-being too. So, it is important to assess this dynamic progress to ensure a check on it. This study is conducted to ascertain the advancements in digital lending, examine the problems in digital banking, and the control mechanisms to be exercised in digital lending to ensure stakeholders interest is proctected.

2. Literature Review

Tavaga, (2021), ascertains, that with the Indian Government's vision of a cashless economy and rapid development in improving internet availability throughout the nation, online banking users in India are expected to reach 150 million by the end of 2020.

The discussion paper titled from NITI Ayog, India highlights the need forsetting up full-stack 'digital banks', which would principally rely on the internet and other proximate channels to offer their services and not physical branches, to mitigate the financial deepening challenges being faced in the country.

BasuChandola (2021), expresses, that while Digital Banks will rely principally on the internet and other proximate channels for offering services, the question is whether they should be allowed to open any/ limited physical branches/ correspondence. Due to lowfinancial literacy in semi-urban and rural areas in India, there is a need to impart financial education on even the most basic banking services. A principle-based approach must be

[1]Supriya Suri, 2022, “Be Wary of Malice from Digital Lenders”

https://www.outlookindia.com/business/be-wary-of-malice-from-digital-lenders-news-50191

taken where the regulator sets out the objectives, and the licensees figure out the mode of meeting those objectives.

Supriya Suri, (2022), According to a recent report by Reserve Bank of India’s Working Group, over 1,100 digital lending apps are available on Indian app stores. Surprisingly, more than 600 apps were found to be unlawful. These lending apps are primarily a digital layer between traditional banking entities and customers, conducting the facilitation of financial services.

3. **Digital Banking:**

The way banking business is done has changed in the last decade or so. The emphasisby the Indian government to build a cashless economy is also adding fuel to this digital revolution. Digital banking is providing traditional banking services through the automation of systems. It also encompasses digitalizing all banking services online instead of physical banking and ensuring that a customer does not need to visit the bank for any operations. The purpose is to establish the virtual presence of banks and banking operations in customers’lives and make it convenient for them to access services through digital advancements.This digitalization provides banking services 24*7*365 to the customers uninterruptedlyin remote areas as well.

Digital Lending: It is a process of providing credit onlinebyfintech companies. This is a new-age banking practice where credit or loan is sanctioned to the borrowers through completely online or digital platforms. i.e., mobile applications, and online portals. It is a technology that allows banks or financial establishments to provide speedier loan servicesat the point of sale to boost productivity. There is rise in contactless digital lending which is becoming popular with every passing day resulting in greater financial inclusion.

Digital Lending Platforms and Issues

A digital lending platform is an idea that provides financial institutions an opportunity to sell loan products at a faster speed, and increase revenuethrough optimum use of technology. Lendingkart, Pinelabs, Mobikwik, Shiksha finance, MoneyTap, Paytm, Policy Bazaar, etc., are some of the leading lending platforms which are fuelling the growth of digital lending in India. These platforms are proving to be a bridge for financial inclusion and offer increased quality of financial services to underserved businesses and people. But it must be noted that, while lending in India is closely regulated, digital lending is not[2].

[2](Shilpa Mankar Ahluwalia, Financial Express, Nov. 29, 2021, https://www.financialexpress.com/opinion/regulating-digital-lending/2377827/

These platforms charge anywhere between 1- 6% of fees or commission to the Bank or NBFCs depending on their agreement. And the business is simple, the more the leads the higher the commissions. Hence FinTechs pitch hard and push aggressively for people to download their Mobile Apps and apply for loans. In the process, there are FinTechs doing anything and everything to disburse the loans[3].

4. Statement of the problem

In recent times, it is observed that certain "bad practices" in the digital lending environment related to the unauthorized use of data and intrusive recovery practices prompted the central bank to constitute a Working Group on Digital Lending.The report recently released from this Working Group makes the important point that the digital lending sector has evolved to a point where there is now a regulatory gap that needs to be plugged with laws that address issues specific to digital lending. Protecting Indian borrowers from this is the need of the hour and it is tricky due to the ineffective existing laws and inability to track FinTeck companies and borrowers.

It is in this backdrop,that this study looks into the problems associated with digital lending, consumer awareness about the cost of the loans, exploitation of borrowers, need for regulation to strengthen digital lending in the days to come.

5. Objectives

The exponential growth in digital lending has raised the eyebrows of stakeholders in the financial market. It is observed that these developments are hurting the interest of the borrowers. In, this regard,this study is undertaken with the following objectives.

a. To ascertain the level of clarity and understanding among the borrowers about digital lending
b. To assess the need for regulatory norms for FinTech companies with digital lending

6. Hypothesis

To attain the above objectives, the following hypotheses were established and tested subsequently.

Ho_1: The borrowers do not have a complete understanding of the terms and conditions as expressed by FinTech Companies

[3]Amol Dethe, 2021, Article in Economic Times, https://bfsi.economictimes.indiatimes.com/news/editors-view/what-is-going-wrong-with-fintechs-operating-in-digital-lending/80002856

Ho_2: There is no need for any regulatory norms presently to control digital lending in India

7. Results and Analysis

Based on the responses collected, it is observed that almost half of the digital lending users are coming from Metro cities, and another 20% of users are from the Urban Cities.Private sector employees constituted 51% of total digital lending users based on their employment among the respondents. Among the income profile, 76% of the digital lending users earn income of more than Rs. 5 Lakh p.a., which makes us believe the users are fromhigher-incomegroups.

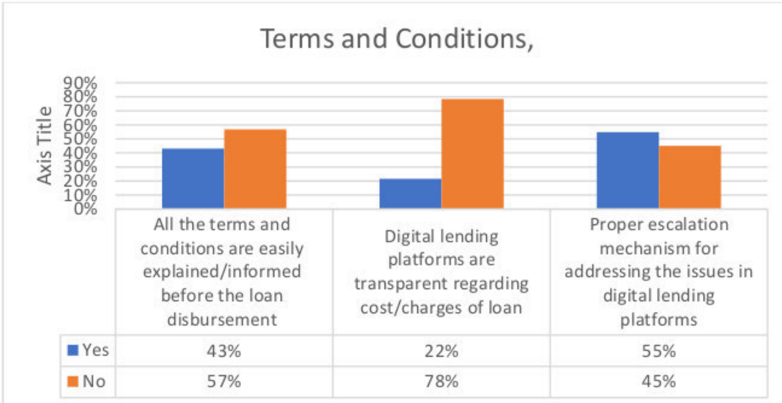
On observing the most prominent Digital Lending Platforms used by users, it is found that Lazy Pay, Lendingkart, and MoneyTap are the top three Digital Lending Platforms used by customers.

The researcher finds that 78% of the respondents agreed Digital Lending Platforms are more convenient compared to other modes of lending, and 65% of respondents agreed it is a quick

way of availing the loans, and also 63% of respondents agreed they prefer digital lending for its customization as the strongest reasons for opting the digital lending, however, only 14% of the respondents agreed that digital lending is trustworthy.

The responses collected are presented graphically for certain selected questions in the following chart.

Figure No. 7. 1 - All the terms and conditions are easily explained/informed before the loan disbursement



From the above chart,it's clear that 22 out of 51 (43%) respondents responded they have not explainedthe terms and conditions of the loan disbursement. It's evident that there area lot of hidden costs in digital lending platforms, 78% (40 of 51) of the respondents expressed that there are hidden costs in digital lendingthat they experienced at later stages.From the above response, it is found that 55% of the respondents find FinTech companies exercise proper escalation mechanisms for grievance redressal. Upon studying, observing, and analyzing the data collected it is found that there is a need for regulatory norms to regulate the FinTech companies lending digital loans in near future.

To check the relationship between the awareness of terms and conditions and the recommendations to digital platforms by customers Chi-Square test was conducted.

Chi-Square (Observed Value)	**0.08**
Chi-Square (Critical Value)	8.3
DF	4
P Value	<0.05
Alpha	0.05

Since the Chi-Square observed value is less than the critical value, the alternative hypothesisis rejected and the null hypothesisis accepted. Hence, it can be conducted that the borrowers do not have a complete awareness of terms and conditions, and their recommendations to digital platforms by being independent.It is also observed that recommendation to digital lending platforms depends not only on the awareness of terms and conditions but also on other factors.

8. Conclusion

Digital lending is an advanced tool in the hands of financial institutions. It is useful in attracting customers and offering small loans with minimum or no collateral. The study conducted provides a greater understanding of the extent and reach of digital loan and lending platforms. This is due to the convenience, quickness, and customization it offers to the high-income earning group in metro cities. The study also finds that customers are kept in dark by not disclosing terms and conditions completely, with the increased cost of the loans and with hidden costs. As a result, it is ideal to conclude that, it is time for the government or policymakers to think aboutestablishing regulatory norms on FinTeck companies to avoid any unwanted consequences in the future affecting all the stakeholders of digital lending in India.

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Antige-Pantige: Vanishing Variant of Folk Song

Abstract

India is known for its wide range of folk songsand its cultural mosaic of varied hues is fascinating. The tradition of folk songs has a long and illustrious history inIndia. Some of them have spread from rural regions to big cities, and they have become an important part of every Indian's life asa means of entertainment, religious and cultural expression. Almost every area in India has its unique folk music that reflects its culture. Folk music originated to alleviate the monotony of everyday life and is closely connected with farming and other similar vocational activities.In this paper,the author discusses the origin and growth of Antige–Pantige, a folk song tradition of Malnad region of Karnataka and its rituals. Unlike other cultural practices this folk song is on the verge of disappearancein the contemporary society.

Key Words: Folk Media, Folk Song, Folk Music, Culture.

Introduction

"*In Folk Song, the earth sings, the mountain sings, the river flows, the crops sing*."

- **Mahatma Gandhi**

Singing is an act of communication and therefore can be studied as behaviour. Since a folk song is transmitted orally by all or most members of a culture, generation after generation, it represents an extremely high consensus about patterns of meaning and behaviour of cultural rather than individual significance. In this discussion of the good and the beautiful, the fit of song performance behaviour and cultural norms will be examined transculturally, and the terms of the argument, therefore, must be extremely general. In order to begin on somewhat familiar ground, it will first be suggested that there is not only a fit between performance behaviour and cultural pattern, but between these two and the emotional set embedded in them. (Lomax, A. 1967)

Definitions of Folk Song

Folk song is an anonymously composed song that is passed down orallyfrom generation or generation. Recent research has cast doubt on the assumption that folk song originated as collective compositions. It assumesthat the seed of a folk tune is created by an individual and then transformed into a group-produced expression via transmission. Folk song reflects national and ethnic identity, even when songs are transferred from one country to another.

Folk song isa song that has its roots in traditional popular culture or is written in that way. It is passed down orally, whether it be sung by an unknown composer or song performed according to tradition over a lengthy period of time. It refers to several types of songs; the meaning of the phrase changes depending on the region of the world, social class, and historical context.

Definitions of the folk song range from the most romantic to the most prosaic. Very few have given more beautiful expression to the former than Theodore Storm when he wrote “Such charming songs are not made at all, they grow, they fall from the sky and glide over the country like gossamer; people sing them simultaneously in thousand different places; it is as if all of us had shared in their creation (W. F. Amann, 1955).

According to The Columbia Electronic Encyclopaedia (2013) folk song is a song of which the song and text have been handed down by oral tradition among the common people.

Importance of Folk Songs

Aaron (2017), former Counsellor at Youth Haven Ranches explains the importance of folk songs. He says folk tunes bring down the complexity of modern instrumentation and takes it back to basics. It gives the artist an ability to focus on just honing his/her skills on just a couple instruments. It takes to down from all of the hustle and bustle of the world and takes it right back to nature, for people whoreally love nature, and everything in it.

Folk song is significant because it reconnects you with your roots. Folk song can take numerous shapes, but it is all song without synthesisers in the end. People in various civilizations would frequently convey stories through songs. Folk songs are highly diverse, spanning every generation on the planet. That is why, in its current form, folk song is primarily instrumental. It recounts a narrative about history.

Characteristics of Folk Songs

The folk songs of the countryside provide a look into the rural environment. They are a mirror of rural society as well as a source of amusement for the rural people. The word "folk music" was coined in the nineteenth century, but it is frequently used to refer to folksong that was the earlierincarnation. The characteristics of folk songs are:

1. The folk song has no defined principles or written regulations. The folk song, on the other hand, necessitates the use of a certain pattern, which anyone unfamiliar with it will be unable to comprehend.
2. In folk music, there is a lot of repetition. The opening line of a song is crucial, and the rest of the lines are generally written to rhyme with it. The other lines retain a rhyming pattern with some modification.
3. Few folk songs include lyrics in the type of questions. In the first verse, a question is posed, and the remaining verses are responses to the query.
4. Folk songs connect legendaryand mythicalcharacters such as Rama, Krishna, Sita, Parvati, and others to everyday life. These songs inspire the most oppressed to rise up and fight back.
5. Folk song lyrics are natural and flowing.
6. Sports songs, farm songs, caste songs, area songs, children's songs, god-goddesses songs, local songs, and so on are all popular folk song topics.
7. Folk music has a strong nationalist element to it, as it is more closely identified with popular culture than with the creative elite. (Shakeel Anwar, 2018)

Research Methodology

This investigation is qualitative. The researcher used secondary data from many libraries for this investigation. The folk traditions of the Antige-Pantige in Karnataka were studied using information from numerous published books, encyclopaedias, journals, and periodicals. Due to a shortage of resources, the investigator conducts interviews with seniors from a range of Antige-Pantige singing groups. This study looks at the many genres, circumstances, themes, and compositional techniques used in Antige-Pantige folk songs. To understand the peculiarities of Antige-Pantige folksongs, the study examines Antige-Pantige culture, including its historical origins, language, religions, socio-cultural values, and vocations. An analysis revealed that singers in Antige-Pantige folk music perform a variety of tunes.

Antige -Pantige

Antige-Pantige is a religious, community ritual that was commonly popular in Shivamogga, Chikkamagaluru and some parts of North Kannada districts,practiced by the Okkaliga, Hasala, Diva, Lingayata and Bantcommunities. This activity takes place during the Deepavali festival (Festival of Lights). The word 'Antige' is derived from 'DeepaAntisuvudu' (Lighting a Lamp) 'Pantige' is associated with Pantagai (Tamil) and 'Pandaga' (Telugu) both the words meaning 'festival'. Another interpretation links it to the Tamil and Malayalam words 'Pantam' meaning 'Lamp'. Even in Kannada the word 'Hanate', this again means an earthen lamp. The combination 'Antige-Pantige' is associated with lighting a lamp and taking them around the streets of a village. The songs that are used during this occasion are called 'Antike-PantikePadagalu' (Antige-Pantigesongs).

In Malnad region of Karnataka, Deepavali is celebrated for five days and the "Antige-Pantike" ceremony begins on the evening of the second day. Young people of a given village assemble at a field called 'JattigaBana' or at a temple. They worship the deity and then the light is lit from the 'Nandadipa' at the temple. It is a big lamp made of either bronze or clay. Usually it comes with a handle. The troupe carries some oil in an earthen jug to replenish the supply. The troupe consists of five persons. The leader carries the lamp with him. Two singers walk in front of him and the other two follow him. There is no special costume meant for this ritual. They wear simple shirt/jubba, dhoti and a headgear (rumalu). The singers hold thick sticks to ward off danger.

They do not use instruments. The lamp is protected from wind so that it is not extinguished. Such an event is considered a bad omen. The troupe in every village, they go from house to house lighting a lamp belonging to the family, with the lamp that they have carried with them. Usually, they visit only such families that are above them in the caste hierarchy. Every act connected with this activity has a song associated with it. They sing a song requesting the family to open the door. Another song is presented when lighting the lamp. There are many more songs that follow suit. They move on to the next house, once the lamp is lit and kept in a particular place called Balindrana Kamba.

Rituals

The troops of the village go from house to house singing on the occasion of Balipadyami, for three days. They carry the divine message of Diwali's light on the house, and sing like this.

'Born in the soil,
Raised in the soil,
Opened the eyes in oil,
I burn through the eyes of truth' - says the lamp which lights the world. The house is described as a beautiful palace for luminaries, a golden door, and a diamond column. They open the door and let the lamp stands come in. The owner of the house pours oil into the lamp, keeps it before God and makes arrangements for lunch. Then the people who hold the lamps sing about the goodwill that is brought by the lamp to the society as well as people and they highlight that it is the good deed of such people we are enjoying the life. Live for thousand years!

They sing longer narratives also during their journey from village to village. GunasagariPada, GovinaPada, Gange-GowriPada and ShivayogiPada are some of them. Occasionally there is a touch of ribaldry and the obscene in these songs. They are also known as 'BallaliPadagalu' and 'BingiPadagalu'.

Teams and Rules

There are many groups of 2 to 6 people going to the festival in one area (2 groups of villagers). They go to the temple that night holding the lamps and singing along the way. The elder of the town takes over the leadership of the team at the Lighthouse Fair. There are ten to fifty people in the team. Four of them are singers, two of them front men and two backing vocalists. The team consists of people who carry the light, people who collect the funds. Thus, these people who carry the lamp go out to the neighbouring villages in large numbers. In the dark, shouting among the jungle, they shout 'deepadeepolge'. The people who burn the claw, and the ones who hold the lanterns walk beside them. It is believed that it is a bad omen if the lamp runs out in the middle.

Antige-Pantige is bound by some strictrules. For instance, paths of two such troupes are not supposed to cross one another. If such an eventuality takes place, they ward off one another by shouting ‘Deepadeepolage’. The team should only be built during the nights of Deepavali festival. The lamp which is being lit in the temple should not be turned down until it enters the premises of fire post. They should greet the lamp and pour oil when enters the door. People who hold the lamp should not wear slippers. They are not allowed for urinals and excretion. Similarly, if some untoward incident like death or pollution has taken place in the family that has to receive the lamp first, the ritual is suspended for that year and it is not resumed for the next three years. Every family gives something to the singing troupe either in cash or kind. After travelling like this for a number of days, the troupe returns to its village. They assemble at the ‘Jattigbana’ or at the temple from which point they started their journey. The lamp is left there till the next Deepavali.“Antike-Pantike” is a typical regional practice and it has enriched the cultural life of these communities.

The Lyrical Meaning and Feel

The teams which are dispatched from their villages with the leading lamp will go door to door singing songs ‘The light of wisdom and wealth has arrived, dear goddess of home(the woman in the house) please let us in by opening the door’. And also sing ‘have been walking in barefoot through a rough and difficult road with sharp stones and poisonous thorns, please take the divine light and lit your lamps’. By singing these songs the team allows the people to lighten their lamps by the lamp which they have brought. After giving the light, the team will perform the Arjunajogi (Story of Arjuna), Uttaradevi’s, Tereyleyuva (Closing the curtain), Karu(the cow) songs together in front of the house. At last, they will sing a Mangalageete which will be a valedictory song of the performance. The songs are mainly in three-line style (triplet), however,two and four-line tunes are occasionally included. The songs also include simple poetic works along with Lavani and folk-dance songs. There will be no instrument accompaniment for the performance. It will be only vocal performance. The songs which are sung are focused on historical events, Shiva and Sharana’s songs and their family stories which will have a message. The singingteams will get oil, clothes, food grains, fruits, some money and other essential materials from each houses of the village.

Formation of the Songs:

The tradition will continue for three straight nights of Deepavali festival. The basic practice of this tradition is primarily limitedto lighting the lamps and to carry them to pass it on. But the artists and the songs in this tradition are not bound only to this concern;but it is way beyond this. These songs can be classified into two main categories as they have mastered many stories told only while travelling.

1. The songs for lighting lamps
2. The general songs

The songs to open the door, lightening the lamp, the songs of Lord Balindra, songs to pour oil, songs of Goddess, Songs of In-laws, Songs to diminish the lamp comes under the first category. The second one includes all kinds of songs in which songs of cow, Gange-Gowrisongs, songs from Mahabharata, stories of Draupadi, Arjuna, Uttare etc. are important.

Conclusion of the Ceremony:

To conclude the three-day long process, a place having the banyan and jackfruit tree is looked around and selected. The lamps are kept in the branches of jackfruit tree and will be worshiped there itself. A sumptuous lunch will be organized for all the villagers with the collected food grains and money by the singing team(the people carrying the light across). The lunch will be organized in the same field where those trees are worshipped. The light team will worship the lamp saying 'O divine lamp, we have offered you jaggery, coconut fruit etc., you should bless us and come back next year'.

By completing this, the rituals are completed at the end of festival Deepavali. This tradition is the symbol of spreading wisdom by passing the divine lamp across the villages. It is basically a practice of lightening the lamp and praying the lord for good yield and health. By this practice, children will learn how harmony and peace are important. And sharing always increases the boundaries of knowledge of the ones who share it. These complex things are explained by these traditions in villages.

Cultural Yore

While folk art has always been an essential part of culture and society, folklore or oral transmission has traditionally been thought to be the most significant kind of teaching. An analytical and descriptive study was carried out to identify the endangered folk song of Antige-Pantige in this era of changing forms of media with the arrival of digital platforms and social media.

The folk arts offer a number of benefits over mass media such as newspapers, radio, and television. Folk arts are an inseparable part of people's culture and heritage, and as a result, they have instant public appeal. In a cultural vacuum, no communication can completely exist. Folk media has a higher level of public credibility because it takes the audience on a journey through emotional, intellectual, and subconscious levels of experience through song, melody, dance, speculations, fantasy, comedy, and intriguing information. They completely engage the audience and communicate at a level when audience identification is at its peak.

Folk arts such as Antige-Pantigeare endangered. Only a few experts attempted to document it. The majority of individuals had never heard of Antige-Pantige. Because it did not reach a sufficient number of people with accurate and timely information. It has been determined that several traditional mediums of communication may be employed as the most effective medium of communication for transferring farm technologies or messaging to rural and tribal populations. Its efficacy is determined on the sort of message to be transmitted and how well it is blended into traditional media formats, as well as the settings in which it is employed and the types of viewers. The emotional attraction of this classic folk song outweighs its cerebral appeal. Their goal is to inspire rather than to inform. Folk songs, as a result, must be treated with care and respect if they are to inspire societal change.

A Mode of Communication

The language, colloquial dialect, and instruments used by the locals all influence the folkmusic. As a result, each geographical area has its own brand of folk music. Folk music is particularly liked since it does not need any complex setups or preparation. People begin to sing wherever a crowd gathers, and others gradually join in. Folk lyrics are remarkable because they reflectpeople's hardships while making a sarcastic jab at the authorities.

Folk and traditional media were born out of the human need to express, connect, and share something different and wonderful. Folk performing arts have evolved through generations to meet the requirements of changing circumstances while maintaining its utilitarian significance to the society at large.

2

Traditional folk songs have played an important part in rural development since the turn of the century, and with the arrival of new media, communication formats and methods have grown more specialised. Every human community has established its own set of traditional communication means and channels that define its existence, organisation, and progress. These communication modalities and channels serve as the foundation for communities, particularly rural ones.

Antige-Pantigeis acultural institution that transmitsvalues, thoughts, norms, beliefs, and experiences in society, and they have been doing so for centuries with immaculate results. Antige-Pantige is also a true reservoir of human experiences, portraying a realistic picture of mass culture and so becoming a vital element of the growth process.

Antige-Pantige appeals to people's hearts and minds on a personal, intimate level, with a familiar structure and content, as well as the colloquial languages utilised. Make communication clear. There are no cross-cultural communication barriers here. The many diverse groupings and forms available for certain homogeneous groups and for specific objectives can be used to cater to people from various regions.

Measures to Preserve Antige -Pantige

Songs that are on the verge of extinction should be taught in schools and colleges as part of the curriculum.The Song and Drama Division's active adoption for public presentation is needed.Preserve and improve our folk song traditionby promoting and performing it in a variety of settings, such as group song competitions in schools, whether local, national, or worldwide, with government assistance.

People created folk media, which has always served to entertain, educate, reinforce, or change current beliefs and attitudes. Folk media channels have proved to be effective communication tools in rural communities due to their close proximity to the people at local level. They deserve to be studied and treated scientifically in order to become effective and efficientinstructors of the masses on personal issues such as contraception. Here the communicator has a significant function to play in this scenario. He should use "polite persuasion and disguised compulsion" as a strategy.

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On Domination Number and Eccentric Connectivity Index of Transformation Graphs

Abstract

A set $D \subseteq V$ is a dominating set of G if every vertex in $V - D$ is adjacent to one or more vertices in D. The minimum cardinality of a dominating set of a graph G is called the domination number of G and is denoted by $\gamma(G)$. The eccentric-connectivity index is the sum of the product of eccentricity and degree of every vertex in G. In this paper, we present upper bounds for the total transformation graphs in terms of domination number and eccentric connectivity index of a graph G.

Keywords: Domination number, Eccentricity connectivity index,Transformation graphs.

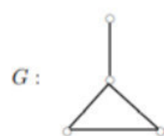
AMS Subject Classification: 05C69; 05C92.

1. Introduction

Let $G = (V, E)$ be a graph with $|V| = n$ and $|E| = m$. The degree of a vertex $v \in G$ is denoted by $\deg_G(v)$ and defined as $\deg_G(v) = |\{u \mid uv \in E(G)\}|$. The Eccentricity of a vertex $v \in G$ is the largest distance between v and u for some $u \in V(G)$. A set $D \subseteq V$ is a dominating set of G if every vertex $V - D$ is adjacent to one or more vertices in D. The minimum cardinality of a dominating set of a graph G is called the domination number of G and is denoted by $\gamma(G)$. A dominating set D with minimum cardinality is called $\gamma(G)$-set of G. Further, a minimal dominating set is a dominating set in a graph that is not a proper subset of any other dominating set. We follow [5] for unexplained terminology and notation. Sharma et.al., [13] have put forward a novel topological index namely, the eccentric-connectivity index $ECI(G)$ of a molecular graph G is defined as follows:

$$ECI(G) = \sum_{i=1}^{n} \left(e(v_i)\deg(v_i)\right).$$

For more details on topological indices refer [3, 8, 9, 14, 15]. Wu and Meng [16] have generalized the total graph by defining the following transformation graphs.



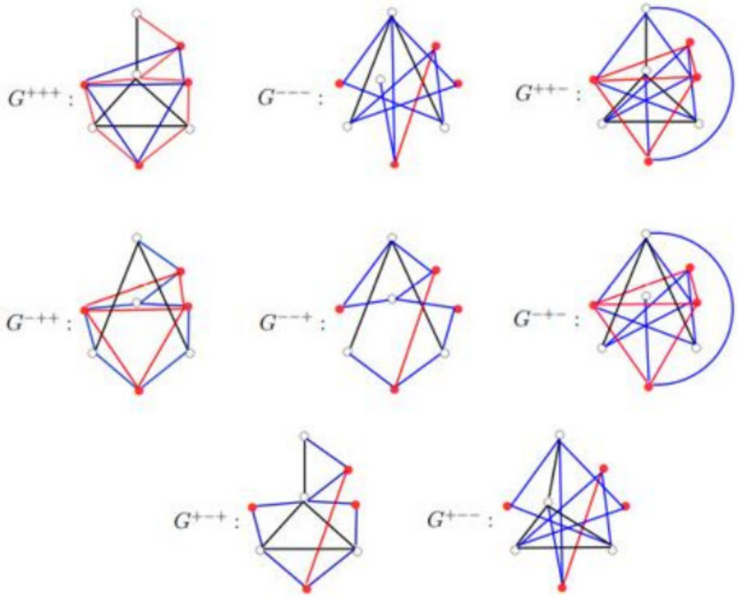


Figure 1. A graph G and its transformation graphs.

2. Results

In this section we obtain upper bounds for domination number together with eccentric connectivity index of total transformation graphs in terms of order, size and the first Zagreb index.

Theorem 1. Let $G=(n,m)$ be any connected graph, then

$$\gamma\left(G^{+++}\right)+ECI\left(G^{+++}\right)\leq 2ECI(G)+M_1(G)+\frac{9m+n}{2}+\xi(G) \tag{2}$$

Where $\xi(G)=\sum_{u_j u_k\in E(G)} e_G(u_j)\left(\deg_G(u_j)+\deg_G(u_k)\right)$.

Proof. Let $G=(V,E)$ be a graph with $V(G)=\{v_1,v_2,v_3,\ldots,v_n\}$ and $E(G)=\{e_1,e_2,e_3,\ldots,e_m\}$. Then $V\left(G^{+++}\right)=(v_1,v_2,v_3,\ldots,e_1,e_2,e_3,\ldots,e_m)$. Clearly $\left|V\left(G^{+++}\right)\right|=m+n$. Since for any connected graph G, $\gamma(G)\leq\frac{n}{2}$.

Therefore,

$$\gamma\left(G^{+++}\right)\leq\frac{m+n}{2} \tag{3}$$

Further,

$$ECI\left(G^{+++}\right)=\sum_{u_i\in V\left(G^{+++}\right)\cap V(G)} e_{G^{+++}}(u_i)\deg_{G^{+++}}(u_i)+\sum_{u_j\in V\left(G^{+++}\right)\cap E(G)} e_{G^{+++}}(u_j)\deg_{G^{+++}}(u_j)$$

$$\leq \sum_{u \in V(G)} [(e_G(u_i)+1)2\deg_G(u_i)] + \sum_{u_j, u_k \in E(G)} [(e_G(u_j)+1)(\deg_G(u_j)+\deg_G(u_k))]$$

$$2\sum_{u_i \in V(G)} e_G(u_i)\deg_G(u_i) + 2\sum_{u_i \in V(G)} \deg_G(u_i) + \sum_{u_j u_k \in E(G)} e_G(u_j)(\deg_G(u_j)+\deg_G(u_k))$$

$$+\sum_{u_j u_k \in E(G)} (\deg_G(u_j)+\deg_G(u_k)) \leq 2ECI(G) + M_1(G) + 4m + \xi(G) \qquad (4)$$

Hence by (3) and (4) the result follows.

Theorem 2. Let $G=(n,m)$ graph, then

$$\gamma(G^{---}) + ECI(G^{---}) \leq 3(m+n)(m+n-1) + \frac{(m+n)}{2} - 12m - 3M_1(G).$$

Proof. Let $G=(V,E)$ be a graph with $V(G)=\{v_1,v_2,v_3,\ldots,v_n\}$ and $E(G)=\{e_1,e_2,e_3,\ldots,e_m\}$.

Then $V(G^{---})=(v_1,v_2,v_3,\ldots,e_1,e_2,e_3,\ldots,e_m)$, Clearly $|V(G^{---})|=m+n$. Since for any connected graph G, $\gamma(G)\leq \frac{n}{2}$.

Therefore,

$$\gamma(G^{---}) \leq \frac{m+n}{2}. \qquad (5)$$

Further,

$$ECI(G^{---}) = \sum_{u_i \in V(G^{---}) \cap V(G)} e_{G^{---}}(u_i)\deg_{G^{---}}(u_i) + \sum_{u_j \in V(G^{---}) \cap E(G)} e_{G^{---}}(u_j)\deg_{G^{---}}(u_j)$$

$$\leq \sum_{u_i V(G)} [3(m+n-1-2(\deg_G(u_i)))] + \sum_{uj, u_k \in E(G)} [3(m+n-1-(\deg_G(u_j)+\deg_G(u_k)))]$$

$$+\sum_{uj, u_k \in E(G)} [3(m+n-1-(\deg_G(u_j)+\deg_G(u_k)))]$$

$$= 3(m+n-1)n - 6\sum_{u_i \in V(G)} (\deg_G(u_i))$$

$$+3(m+n-1)m - 6\sum_{u_j u_k \in E(G)} (\deg_G(u_j)+\deg_G(u_k))$$

$$\leq 3(m+n)(m+n-1) - 12m - 3M_1(G) \qquad (6)$$

Hence by (5) and (6) the result follows.

Theorem 3. Let $G=(n,m)$ graph, then

$$\gamma(G^{++-}) + ECI(G^{++-}) \leq 4mn + 4m(n-4) + \frac{(m+n)}{2} + 4M_1(G).$$

Proof. Let $G=(V,E)$ be a graph with $V(G)=\{v_1,v_2,v_3,\ldots,v_n\}$ and $E(G)=\{e_1,e_2,e_3,\ldots,e_m\}$.

Then $V(G^{++-})=(v_1,v_2,v_3,\ldots,e_1,e_2,e_3,\ldots,e_m)$, Clearly $|V(G^{++-})|=m+n$. Since for any connected graph G, $\gamma(G) \le \frac{n}{2}$.

Therefore,

$$\gamma\left(G^{++-}\right) \le \frac{m+n}{2}. \tag{7}$$

Further,

$$ECI\left(G^{++-}\right) = \sum_{u_i \in V\left(G^{++-}\right) \cap V(G)} e_{G^{++-}}(u_i) \deg_{G^{++-}}(u_i) + \sum_{u_j \in V\left(G^{++-}\right) \cap E(G)} e_{G^{++-}}(u_j) \deg_{G^{++-}}(u_j)$$

$$\le \sum_{u_i \in V(G)} [4m] + \sum_{u_j, u_k \in E(G)} \left[4\left(n - 4 + \left(\deg_G\left(u_j\right) + \deg_G\left(u_k\right)\right)\right)\right]$$

$$\le 4mn + 4m(n-4) + 4M_1(G). \tag{8}$$

Hence by (7) and (8) the result follows.

Theorem 4. Let $G = (n,m)$ graph, then

$$\gamma\left(G^{--+}\right) + ECI\left(G^{--+}\right) \le 3n(n+1) - 6m + 3m(m+3) + \frac{(m+n)}{2} - 3M_1(G).$$

Proof. Let $G = (V,E)$ be a graph with $V(G) = \{v_1, v_2, v_3, \ldots, v_n\}$ and $E(G) = \{e_1, e_2, e_3, \ldots, e_m\}$.

Then $V\left(G^{--+}\right) = (v_1, v_2, v_3, \ldots, v_n, e_1, e_2, e_3, \ldots, e_m)$, Clearly $\left|V\left(G^{--+}\right)\right| = m + n$. Since for any connected graph G, $\gamma(G) \le \frac{n}{2}$.

Therefore,

$$\gamma\left(G^{--+}\right) \le \frac{m+n}{2}. \tag{9}$$

Further,

$$ECI\left(G^{--+}\right) = \sum_{i=1}^{n} e_{G^{--+}}(u) \deg_{G^{--+}}(u)$$

$$= \sum_{u_i \in V\left(G^{--+}\right) \cap V(G)} e_{G^{--+}}(u_i) \deg_{G^{--+}}(u_i) + \sum_{u_j \in V\left(G^{--+}\right) \cap E(G)} e_{G^{--+}}(u_j) \deg_{G^{--+}}(u_j)$$

$$\le \sum_{u_i \in V(G)} [3(n + 1 - (\deg_G(u_i)))]$$

$$+ \sum_{u_j, u_k \in E(G)} [3(m + 3 - (\deg_G(u_j) + \deg_G(u_k)))]$$

$$\le 3n(n+1) - 6m + 3m(m+3) - 3M_1(G) \tag{10}$$

Hence by (9) and (10) the result follows.

Theorem 5. Let $G = (n,m)$ graph, then

$$\gamma(G^{+-+}) + ECI(G^{+-+}) \le 12m + 3m(m+3) + \frac{(m+n)}{2} - 3M_1(G).$$

Proof. Let $G=(V,E)$ be a graph with $V(G)=\{v_1,v_2,v_3,\dots,v_n\}$ and $E(G)=\{e_1,e_2,e_3,\dots,e_m\}$.

Then $V(G^{+-+})=(v_1,v_2,v_3,\dots,v_n,e_1,e_2,e_3,\dots,e_m)$, Clearly $|V(G^{+-+})|=m+n$. Since for any connected graph G, $\gamma(G)\le\frac{n}{2}$.

Therefore,

$$\gamma(G^{+-+}) \le \frac{m+n}{2}. \tag{11}$$

Further,

$$ECI(G^{+-+}) = \sum_{i=1}^{n} e_{G^{+-+}}(u)\deg_{G^{+-+}}(u)$$

$$= \sum_{u_i\in V(G^{+-+})\cap V(G)} e_{G^{+-+}}(u_i)\deg_{G^{+-+}}(u_i) + \sum_{u_j\in V(G^{+-+})\cap E(G)} e_{G^{+-+}}(u_j)\deg_{G^{+-+}}(u_j)$$

$$\le \sum_{u_i\in V(G)} [3(2(\deg_G(u_i)))]$$

$$+ \sum_{u_j,u_k\in E(G)} [3(m+3-(\deg_G(u_j)+\deg_G(u_k)))]$$

$$\le 12m + 3m(m+3) - 3M_1(G) \tag{12}$$

Hence by (11) and (12) the result follows.

Theorem 6. Let $G=(n,m)$ graph, then

$$\gamma(G^{-+-}) + ECI(G^{-+-}) \le 3n(m+n-1) + 3m(n-4) - 12m + \frac{(m+n)}{2} + 3M_1(G).$$

Proof. Let $G=(V,E)$ be a graph with $V(G)=\{v_1,v_2,v_3,\dots,v_n\}$ and $E(G)=\{e_1,e_2,e_3,\dots,e_m\}$.

Then $V(G^{-+-})=(v_1,v_2,v_3,\dots,v_n,e_1,e_2,e_3,\dots,e_m)$, Clearly $|V(G^{-+-})|=m+n$. Since for any connected graph G, $\gamma(G)\le\frac{n}{2}$.

Therefore,

$$\gamma(G^{-+-}) \le \frac{m+n}{2}. \tag{13}$$

Further,

$$ECI(G^{-+-}) = \sum_{i=1}^{n} e_{G^{-+-}}(u)\deg_{G^{-+-}}(u)$$

$$= \sum_{u_i \in V(G^{-+-}) \cap V(G)} e_{G^{-+-}}(u_i) \deg_{G^{-+-}}(u_i) + \sum_{u_j \in V(G^{-+-}) \cap E(G)} e_{G^{-+-}}(u_j) \deg_{G^{-+-}}(u_j)$$

$$\leq \sum_{u_i \in V(G)} [3(m+n-1-2(\deg_G(u_i)))]$$

$$+ \sum_{u_j, u_k \in E(G)} [3(n-4+(\deg_G(u_j)+\deg_G(u_k)))]$$

$$. \leq 3n(m+n-1)+3m(n-4)-12m+3M_1(G) \tag{14}$$

Hence by (13) and (14) the result follows.

Theorem 7. Let $G=(n,m)$ graph, then

$$\gamma(G^{-++}) + ECI(G^{-++}) \leq 3n(n-1) + \frac{(m+n)}{2} + 3M_1(G).$$

Proof. Let $G=(V,E)$ be a graph with $V(G)=\{v_1,v_2,v_3,....,v_n\}$ and $E(G)=\{e_1,e_2,e_3,....,e_m\}$.

Then $V(G^{-++})=(v_1,v_2,v_3,....,v_n,e_1,e_2,e_3,....,e_m)$, Clearly $|V(G^{-++})|=m+n$. Since for any connected graph G, $\gamma(G) \leq \frac{n}{2}$.

Therefore,

$$\gamma(G^{-++}) \leq \frac{m+n}{2}. \tag{15}$$

Further,

$$ECI(G^{-++}) = \sum_{i=1}^{n} e_{G^{-++}}(u) \deg_{G^{-++}}(u)$$

$$= \sum_{u_i \in V(G^{-++}) \cap V(G)} e_{G^{-++}}(u_i) \deg_{G^{-++}}(u_i) + \sum_{u_j \in V(G^{-++}) \cap E(G)} e_{G^{-++}}(u_j) \deg_{G^{-++}}(u_j)$$

$$\leq \sum_{u_i \in V(G)} [3(n-1)]$$

$$+ \sum_{u_j, u_k \in E(G)} [3(\deg_G(u_j)+\deg_G(u_k))]$$

$$\leq 3n(n-1)+3M_1(G) \tag{16}$$

Hence by (15) and (16) the result follows.

Theorem 8. Let $G=(n,m)$ graph, then

$$\gamma(G^{+--}) + ECI(G^{+--}) \leq 4mn + 4m(m+n-1) - \frac{(m+n)}{2} + 4M_1(G).$$

Proof. Let $G=(V,E)$ be a graph with $V(G)=\{v_1,v_2,v_3,....,v_n\}$ and $E(G)=\{e_1,e_2,e_3,....,e_m\}$.

Then $V(G^{+--})=(v_1,v_2,v_3,....,v_n,e_1,e_2,e_3,....,e_m)$, Clearly $|V(G^{+--})|=m+n$. Since for any connected graph G, $\gamma(G) \leq \frac{n}{2}$.

Therefore,

$$\gamma\left(G^{+--}\right) \leq \frac{m+n}{2}. \tag{17}$$

Further,

$$\begin{aligned}
ECI\left(G^{+--}\right) &= \sum_{i=1}^{n} e_{G^{+--}}(u)\deg_{G^{+--}}(u) \\
&= \sum_{u_i \in V\left(G^{-++}\right)\cap V(G)} e_{G^{+--}}(u_i)\deg_{G^{+--}}(u_i) + \sum_{u_j \in V\left(G^{+--}\right)\cap E(G)} e_{G^{+--}}(u_j)\deg_{G^{+--}}(u_j) \\
&\leq \sum_{u_i \in V(G)} [4(m)] + \sum_{u_j, u_k \in E(G)} [4(m+n-1-(\deg_G(u_j)+\deg_G(u_k)))] \\
&\leq 4mn + 4m(m+n-1) - 4M_1(G)
\end{aligned} \tag{18}$$

Hence by (17) and (18) the result follows.

Conclusion

Graph theory is rich area for programmers and computer scientist. Here, we obtained bounds for all eight transformation graphs in terms of domination number and eccentric connectivity index of a graphs.

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A study on collection development and services of e-resources among the deemed to be university libraries in Bangalore, Karnataka.

Abstract:

Academic library is a vital part of a higher education system, and it is very important that libraries have acquire adequate information resources and which relevant and make them to access easily library users. The present study focuses on the awareness and it's usage of e-resources by the students of selected deemed to be universities in Bangalore. The study reveals the problems encountered while using e-resources as well as the satisfaction level of the students. A total of 300 Questionnaires were distributed to the students. 259 (86.33 %) fully completed questionnaire were returned back. A survey was carried out and suitable methods and technologies were used for data collection and analysis. This paper findings shows that the majority of users were aware about the availability of E-resources and they are satisfied with available e-resources.

Key Words: Collection development, Deemed Universities, E-resources, Information communication technology, Library services

1. Introduction:

Generally, e-resources has improved library services. Since most current information is stored electronically, digitalization has significantly assisted librarians in their jobs such as cataloguing, reference, circulation, and serial control. The library as a service-based institution is not left out since new technology has modified many library services and operations. For example, information storage mediums have evolved to include Flash drives, CD-ROMs, hard drives, and cloud storage. Certainly, some libraries have been able to keep up with the advancements in technology, while others still need help.

According to Omekwu (2004), information technology has created new libraries and ways of spreading information. Libraries today include automated, polymedia, electronic, virtual, and digital libraries. Each kind of IT-driven library system has its own characteristics, needs, service model, and issues. According to Nwalo (2000), the use of IT in library services has greatly improved and expanded services. Mosuro (2000) emphasises the importance of IT in library functions: IT advancements have allowed libraries and information centres to acquire, organise, store, and distribute information more efficiently. New information technologies are altering libraries and librarianship and have the ability to change the status quo. Computers and other information technologies now play a major part in data management. No academic library can operate successfully without adequate IT usage.Libraries are vital in meeting users' information requirements. Considering the relevance and roles it plays in information dissemination, university libraries and libraries need to use ICT in their everyday library operations.

Library collection development is moving towards electronic documents and networked information sources. The concept of collection development, which involves building, expanding, dealing with selection and purchase of library items, is evolving towards collection management. Libraries and librarians are now struggling with combining print and electronic information resources including CD-ROM, online, and internet, Shahnaz (2012) A variety of actions connected to the establishment of a library collection are described in the American Library Association's (1983) glossary of library and information science as "determining and coordinating selection policy, assessing user and prospective user requirements, conducting collection usage studies, conducting collection evaluation, identifying collection needs, selecting resources, preparing for resource sharing, and maintaining and updating the library collection." Shipman (1975) defines it as "the whole of a library's collections; books, pamphlets, manuscripts, punched cards, serials, government papers, microfilm, and computer tapes.

2. Related studies

Tiamiyu (2000) listed the benefits of ICT in collection development as: reducing duplication in data entry, improving control and speed of operations; increasing range and depth of service; reducing staff costs; improving staff morale and prestige, and improving the ability to share bibliographic data and resources with other libraries. Research conducted at Pakistani academic libraries by Ramzan and Singh (2009) revealed that there was a low degree of IT availability, particularly in the lack of computer equipment and email and internet access. Standard library software should be used in order to completely automate the responder libraries. Online resources, on the other hand, were discovered to be numerous and comprehensive. According to Anaeme (2006), the rapid growth of ICT applications in libraries, particularly academic libraries, has changed the design and nature of library services. The public used to have to go to a library to get information that was easy to understand and comprehensive. According to the International Federation of Library Associations (2012), electronic resources are "materials accessible by computer, whether by personal computer, mainframe, or mobile devices." to a lack of financing, the availability and usage of electronic information resources has increased dramatically during the last two decades. As a consequence, university libraries have turned to ICT and partnerships with other libraries and information centres to keep their collections relevant to their users. Online databases and public access catalogues include print, pre-print, and archived materials. In the opinion of Heidorn (2011), computer technology and telecommunications have transformed the ways of gathering information, storing it, analysing it, and communicating that information. Academic librarians must therefore look outside the usual collection development methods. According to Ogogua, Emerole, and Egwin (2007), the use of ICT in collection growth would lead to less focus on physical library space and more on paperless or electronic information services.

3. OBJECTIVE OF THE STUDY

The primary objective of this study is to determine the degree to which information technology environments are used in collection development and services in deemed to be university libraries.

1. To examine the different deemed to be university library users.
2. To know the purpose and frequency of usage of the e-resource
3. To find out the utilisation of library resources and services.
4. To assess user satisfaction with library resources.
5. To Study the Awareness and Use of E-Resources in Libraries.

4. STATEMENT OF THE PROBLEM

E-resources is progressively essential to service delivery, particularly in university libraries. Because technologies allow sharing of resources between university libraries, enhance the effectiveness and efficiency of service delivery, reduce time, and allow quick and simple access to networked resources and web-based services, university libraries will provide more up-to-date information to their users.

5. SCOPE AND LIMITATION OF THE STUDY

According to UGC, 14 were deemed to be universities in Karnataka, out of which six universities were selected for this study. This study surveyed the use of e-resources in collection development in selected deemed universities in Bangalore, which are shown in table

Sl. No	Name of University	University Address	Library Website Address
1	Christ	Library Path, Bhavani Nagar, S.G. Palya, Bengaluru, 560029	http://library.christuniversity.in
2	Indian Institute of Science	IISc Campus, Gulmohar Marg, Devasandra Layout, Bengaluru, 560012	https://library.iisc.ac.in/
3	International Institute of Information Technology	26/C, Electronics City, Hosur Road, Bengaluru 560100	https://www.iiitb.ac.in/library-collection
4	Jain	44/4, District Fund Road, behind Big Bazaar, Jayanagara 9th Block, Bengaluru, 560069	https://www.jainuniversity.ac.in/library-resource-center/
5	Jawahar lal Nehru Centre for Advanced Scientific Research	Rachenahalli Lake Rd, Jakkur, Bengaluru,560064	http://lib.jncasr.ac.in/
6	Swami Vivekananda Yoga Anusandhana Samsthana	Eknath Bhavan, #19, Gavipuram Circle, Kempegowda Nagar, Bangalore Agrahara, Bangalore-560018	https://svyasa.edu.in/library.html

6. Data Analysis and Interpretation

Table 01 : University wise distribution of questionnaire.

Deemed-to-be-University	Questionnaire Distributed	Received
Christ	50	43
Indian Institute of Science	50	46
International Institute of Information Technology	50	41
Jain	50	40
Jawaharlal Nehru Centre for Advanced Scientific Research	50	45
Swami Vivekananda Yoga Anusandhana Samsthana	50	44
Total	**300**	**259**

Table 1 shows that all six universities were distributed equally with 50 questionnaires. The Indian Institute of Science returned 46 filled questionnaire, followed by the Jawaharlal Nehru Centre for Advanced Scientific Research with 45, Swami Vivekananda Yoga Anusandhana Samsthana 44, Christ 43, International Institute of Information Technology 41, and Jain 40.

Figure 01 : Gender wise distribution of the respondents

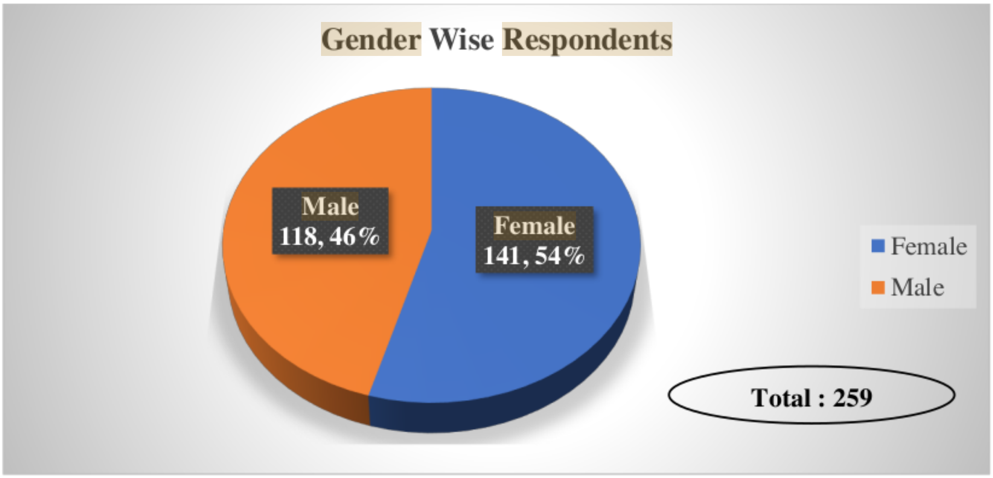


Figure 1 describes the gender distribution of respondents. There are 141 (54%) female respondents and 177 (55%) male respondents out of a total of 259 respondents.

Table 2 : Awareness and Usage of Electronic Resources

Resources	Awareness		Usage	
	Yes	No	Yes	No
E-Audio / Video Lectures	187 (72.2 %)	72 (27.8 %)	134 (51.74 %)	125 (48.26 %)
E-Books	236 (91.12 %)	23 (8.88 %)	169 (65.25 %)	90 (34.75 %)
E-conference proceedings	169 (65.25 %)	90 (34.75 %)	142 (54.83 %)	117 (45.17 %)
E-Journals / Magazines	227 (87.64 %)	32 (31.67 %)	203 (78.38 %)	56 (21.62 %)
E-Research reports / Projects	177 (68.33 %)	82 (34.75 %)	157 (60.62 %)	102 (39.38 %)
E-Dissertation / Thesis	169 (65.25 %)	90 (34.75 %)	138 (53.28 %)	121 (46.72 %)
Open Access resources	209 (80.7 %)	50 (19.3 %)	183 (70.65 %)	76 (29.35 %)

Table 2 describes the respondents' awareness and usage of the electronic resources. It is evident from the table that 187 (72.2 %)are aware of the E-Audio/Video Lectures resources, while 72 (27.8 %)respondents are not aware of the resource. Pertaining to the usage of the E-Audio/Video Lectures resources, 134 (51.74 %)are using the resource, while 125 (48.26 %)are not using this resource.

236 (91.12 %)respondents are aware of the E-books resources, while 23 (8.88 %)respondents are not aware of the resource. Pertaining to the usage of the E-books resources, 169 (65.25 %)respondents are using the resource, while 90 (34.75 %)respondents are not using it.

169 (65.25 %)respondents are aware of the E-conference proceedings resources, while 90 (34.75 %)respondents are not aware of the resource. Pertaining to the usage of theE-conference proceedings resources, 142 (54.83 %)respondents are using the resource, while 117 (45.17 %)respondents are not using it.

227 (87.64 %)respondents are aware of the E-Journal/Magazine resources, while 32 (31.67 %)respondents are not aware of the resource. Pertaining to the usage of the E-Journal/Magazine resources, 203 (78.38 %)respondents are using the resource while 56 (21.62 %)respondents are not using it.

177 (68.33 %)respondents are aware of the E-Research reports / Projects resources, while 82 (34.75 %)respondents are not aware of the resource. Pertaining to the usage of the E-Research reports / Projects resources, 157 (60.62 %)respondents are using the resource while 102 (39.38 %)respondents are not using it.

169 (65.25 %)respondents are aware of the E-Dissertation / Thesis resources, while 90 (34.75 %)respondents are not aware of the resource. Pertaining to the usage of the E-Dissertation / Thesis resources, 138 (53.28 %)respondents are using the resource while 121 (46.72 %) respondents are not using it.

209 (80.7 %)respondents are aware of the Open Access resources, while 50 (19.3 %)respondents are not aware of the resource. Pertaining to the usage of the Open Access resources, 183 (70.65 %)respondents are using the resource while 76 (29.35 %)respondents are not using it.

Figure 02 : Sources of awareness about e-resources

Figure 02 shows that respondents knew about the availability of e-resources from the library through a variety of sources. Through library staff and library website (25.87 % and 23.55%), respectively, are the main sources by which respondents come to know about e-resources. 22.39 % got aware through library visits, 18.53 % from faculties, and only 9.65 % got aware through their friends. The study's findings show that library staff's efforts to make students aware of e-resources are adequate.

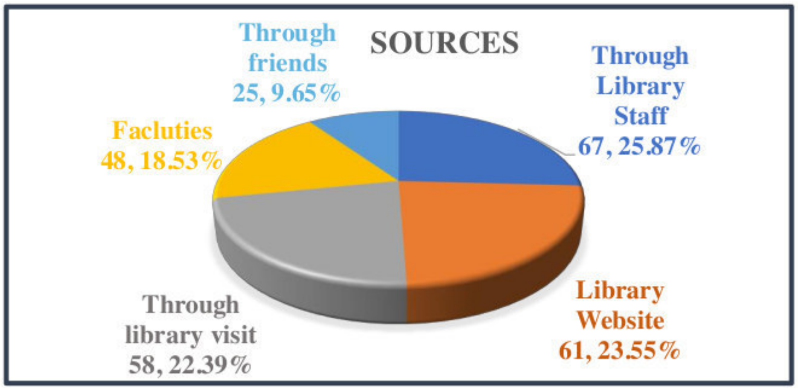


Figure 03 : Methods of learning to use

The respondents were asked a question on how they learned to use e-resources. The obtained responses are shown in Figure 02.

The respondents learned to use e-resources mainly by "guidance from library staff" 95, (36.68 %), "User trainings programs" 87, (33.59 %), "Self-learning / trial and error" 46, (17.76%) and at last through "guidance from friends" 31, (11.97%).

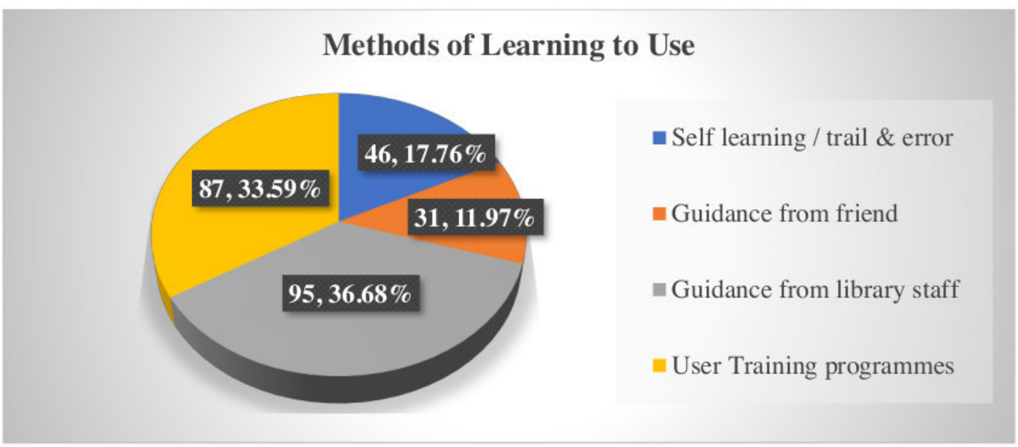


Table 03 : Purpose of Using E-resources

Purpose	Responses	Percentage
To update knowledge	134	51.73
For studying	93	35.91
For writing research paper	79	30.5

Preparation for seminar/ conference/ workshop	81	31.28
For general information	138	53.28
Any other works	43	16.6

Note:Thetotalsampleexceedstherequiredsizesincethequestions areframedinmultiplechoiceformat

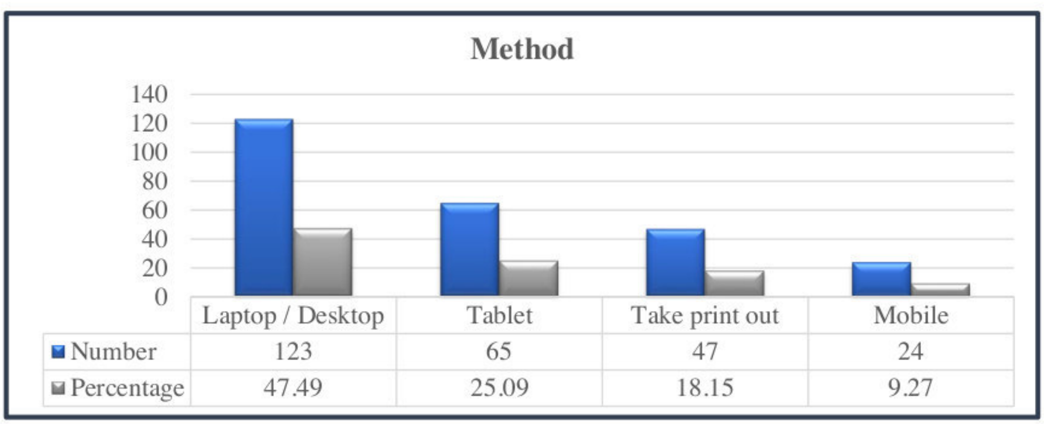
From the Table 03, it is clear that 138 respondents (53.28%) use e-resources for general information followed by 134 respondents (51.73 %) who use e-resources for update knowledge, 93 respondents (36.91%) who use e-resources for studying, 81 respondents (31.28 %) who use e-resources for preparation for seminar/ conference/ workshop, 79 respondents (30.5%) who use e-resources For writing research paperwhile only 43 respondents (16.60 %) use e-resources for other works like taking exams, etc.

Table 04: Frequency of access e-resources

Frequency of Access	No. of Respondents	Percentage
Daily	97	37.45
Weekly	64	24.71
Fortnightly	46	17.76
Monthly	33	12.74
Occasionally	19	7.34
Total	**259**	**100**

The table 04 shows the frequency of use of e- resources by the respondents. Majority of the respondents show that 97 (37.45%) use e-resources daily, followed by 24.71% weekly, 17.76% fortnightly, 12.74% monthly and only 19 of them use e-resources occasionally.

Figure 04 : Preferred Method for Reading E-resources



Respondents were asked to mention how they use e-resource content.It was observed from the analysis that 47.49% of respondents Laptop / Desktop, 25.09% of respondents through tablet, 18.15% of respondents take printouts from e-resources and less than 9.27% of respondents read through mobile.

Table 05 : Satisfaction towards E-resources

The respondents were asked to rank their satisfaction with their library' e-resource services as fully satisfied, satisfied, undecided, partially satisfied, or not satisfied. Table 05 displays the responses collected.

Respondents level of satisfaction with E-Audio / Video Lectures. 17.76% are fully satisfied, 25.48% are satisfied, 33.21% are undecided, 12.74% are partially satisfied, and 10.81% are not satisfied with regards to e-journal availability in the libraries.

E-books are the next most satisfying resource. 20.94% are fully satisfied, 40.15% are satisfied, 18.92% are undecided, 10.04% are partially satisfied and 6.95% are not satisfied with E-books.

The satisfaction level towards e- conference proceedings shows that 19.69% are fully satisfied, 29.34% are satisfied, 32.05% are undecided, 10.81% are partially satisfied and 8.11% are not satisfied.

Satisfaction towards E-resources	Fully Satisfied	Satisfied	Undecided	Partially Satisfied	Not Satisfied
E-Audio / Video Lectures	46 (17.76 %)	66 (25.48 %)	86 (33.21 %)	33 (12.74 %)	28 (10.81%)
E-Books	62 (23.94 %)	104 (40.15 %)	49 (18.92 %)	26 (10.04 %)	18 (6.95 %)
E-conference proceedings	51 (19.69 %)	76 (29.34 %)	83 (32.05 %)	28 (10.81 %)	21 (8.11 %)
E-Journals / Magazines	47 (18.15 %)	113 (43.63 %)	62 (23.94 %)	18 (6.95 %)	19 (7.33 %)
Institutional repository	54 (20.85 %)	119 (45.95 %)	51 (19.69 %)	22 (8.49 %)	13 (5.02 %)
E-research reports / Projects	53 (20.46 %)	91 (35.14 %)	48 (18.53 %)	39 (15.05 %)	28 (10.82 %)
Open Access resources	41 (15.84 %)	87 (33.59 %)	67 (25.86 %)	33 (12.74 %)	31 (11.97 %)

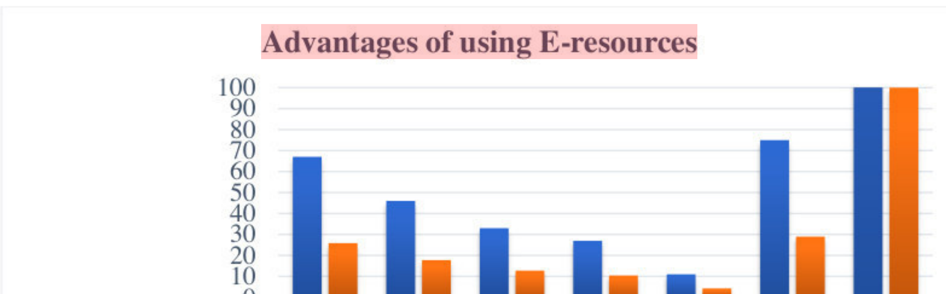
For satisfaction towards E-Journals / Magazines18.15% are fully satisfied, 43.63% are satisfied, 23.94% are undecided, 6.95% are partially satisfied and 7.33% are not satisfied.

Institutional repository satisfaction level is 20.85% are fully satisfied, 45.95% are satisfied, 19.69% are undecided, 8.49% are partially satisfied and 5.02% are not satisfied.

As regards to other e-resources, E-research reports / Projects, 20.46% are fully satisfied, 35.14% are satisfied, 18.53% are undecided, 15.05% are partially satisfied and 10.82% are not satisfied. Respectively for Open Access resources 15.84% are fully satisfied, 33.59% are satisfied, 25.86% are undecided, 12.74% are partially satisfied and 11.97% are not satisfied.

As a result, it was revealed that respondents are generally satisfied with the availability of electronic resources in their libraries. The highest levels of satisfaction were observed for e-journals, E-books, and institutional repositories.

Figure 05 : Advantages of Using E-resources



	Time saving	Easy to use	More informative	More Effective	Remote Access	All above	Total
No. of Respondents	67	46	33	27	11	75	259
%	25.87	17.76	12.74	10.43	4.25	28.95	100

The figure explains that the majority of respondents prefer electronic resources over print resources because 75 (28.95%) believe that e-resources save time, are easier to use, are more informative, efficient, and offer remote access. followed by 67 (25.87%) who find it time-saving, 46 (17.76%) who find it easy to use, 33 (12.74%) who believe e-resources are more informative, and 11 (4.25%) who believe remote access to e-resources is a great advantage.

Table 06: Problem Faced will using E-Resources

Problems	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Credibility and quality issue	15 (5.79 %)	69 (26.64 %)	60 (23.17 %)	101 (39 %)	14 (5.4 %)
Difficulty in finding relevant information	20 (7.72 %)	92 (35.52 %)	37 (14.29 %)	97 (37.45 %)	13 (5.02 %)
Discomfort in online reading	19 (7.34 %)	104 (40.15 %)	31 (11.97 %)	84 (32.43 %)	21 (8.11 %)
Do not have remote access	67 (25.87 %)	110 (42.47 %)	27 (10.42 %)	47 (18.15 %)	8 (3.09 %)
Information overload	19 (7.34 %)	95 (36.68 %)	54 (20.85 %)	81 (31.27 %)	10 (3.86 %)
Lack of guidance from library staff	13 (5.02 %)	23 (8.89 %)	72 (27.79 %)	135 (52.12 %)	16 (6.18 %)
Lack of IT knowledge	14 (5.41 %)	43 (16.6 %)	45 (17.37 %)	129 (49.81 %)	28 (10.81 %)
Limited number of titles available	44 (16.99 %)	104 (40.15 %)	45 (17.37 %)	54 (20.85 %)	12 (4.64 %)
Slow download speed	23 (8.88 %)	59 (22.78 %)	36 (13.9 %)	98 (37.84 %)	43 (16.6 %)

Respondents were asked a question about barriers or problems they encountered when accessing and using electronic resources. When gathering information from the Respondents were asked to indicate the problems they encountered when searching for information using electronic resources. Table-06 reveals that 104 respondents (42.47 %) agreed that they face problem related to do not have remote access, followed by 104 (40.15 %) who found discomfort in online reading, further followed by 95 (36.68 %) information overload, 92 (35.52 %) 22 (12.23%) difficulty in finding relevant information.

Table 07 : Overall Satisfaction level of using E-resources and Services

Level of Satisfaction	No. of Respondents	Percentage
Satisfied	98	37.84%
Very Satisfied	43	16.60%
Extremely Satisfied	46	17.76%

Partially Satisfied	29	11.20%
Dissatisfied	43	16.60%
Total	**259**	**100%**

Table 07 depicts that majority of the respondents are satisfied with the subscribed e-resources and services, 37.84 % were satisfied, followed by 16.60% were very satisfied, 17.76% were extremely satisfied, 11.20% were partially satisfied. 16.60% of respondents were dissatisfied.

7. Conclusion

In this era of information overload, electronic resources play a vital role in acquiring up-to-date knowledge. A wide variety of electronic resources, information is available in different formats. The major challenge to the librarian is to identify the relevant electronic resource among the many available and select the relevant one, making it available to users. The research clearly shows that e-resources are accepted by users, and usage is increasing over time. The study concludes that e-resources are aware to the majority of students. Students increasingly depend on electronic resources to access relevant information for their studies. Based on the findings of this study, it is suggested that library staff try to educate users about subscribed e-resources by organizing training and orientation programs for them.

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Title: Perception of Nursing Students about the Cause and Consequences of Substance Use

Abstract

Since the beginning of human history, people have found ways to alter their bodies and their consciousness by taking various substances such as herbs, alcohol, and drugs. Over the last few decades, drug consumption has become one of the biggest problems affecting millions of children and youth in the country. Students who abuse substances lose interest in activities such as changing their eating or sleeping habits, reducing their interaction with others, making dramatic changes in their studies, and getting into trouble with school officials or legal trouble, all of which affect the emotional and psychological aspects of addicts and their parents. The present study was conducted to understand the Perception of Nursing Students about the Cause and Consequences of Substance Use in selected colleges in Mangalore Taluk, Dakshina Kannada district. The cross-sectional study attempts to yield the responses of 115 nursing students about the causes of and health effects of substance use. The participants were selected through a purposive sampling technique, and a questionnaire was used to obtain data. The girls (70.47%) represent the highest number, while 69.6 per cent of the respondents are pursuing their B.Sc. in nursing, and most of them fall under the age group of 18 years (52.20%). According to the findings, curiosity is the major reason for substance use among adolescents (83.50 %); whereas 60 per cent of them said failure in the relationship can cause substance use. Further, 61.7 per cent of them believed that substance use can lead to a chemical imbalance, while 79.10 per cent of them were unaware that addiction causes dementia. Educating the youth can reduce the adverse health, social and economic consequences of drugs among adolescents.

Key Words: Adolescent, Alcoholism, Drugs&Substance Abuse

Introduction:

Since the beginning of human history, people have discovered different ways to alter their bodies and their consciousness by taking substances such as herbs, alcohol, and drugs. This practise has sprung many important contributions to science, prominent among them being the development of modern medicine and the medical profession. Despite the positive outcome of substance use, there have always been people who could not restrict their use of mind and body-altering substances to culturally prescribed limits and who have fallen into the trap known as addicts today (Dombeck, n.d.). Regardless of age, race, or background, some people from all lifestyles can experience problems with their drug use. Out of curiosity, some of them experiment with recreational drugs, either because their friends are doing it or to ease problems such as stress, anxiety, or depression. However, it is not just illegal drugs, such as cocaine or heroin, that can lead to abuse and addiction, prescription drugs such as painkillers, sleeping pills, and tranquillizers also cause addiction (Robinson, Smith, and Segal, 2019).
Substance use refers to the harmful use of psychoactive substances, including Alcohol, Opiates, Cocaine, Amphetamines, and Hallucinogens, that can cause significant health, economic, and social problems for the people who use them and their families and communities as a whole (Chandra, 2017). According to the World Health Organization (n.d.) Substance use refers to the harmful use of psychoactive substances, which can lead to dependence syndrome. It is characterised by a strong desire to take the drug, difficulties in controlling its use, increased tolerance, persisting in its use despite harmful consequences, and giving the drug a higher priority, which can lead to dependence syndrome. Substance abuse is a preventable disorder that interferes with normal healthy functioning, contributing to physical and behavioural health problems, occupational crises, productivity, and family dysfunction (National Institute on Drug Abuse, 2016).

Substance use among Adolescents:

Alcohol is banned in some parts of our country, but it is legally consumed in the majority of states. There are believed to be 62.5 million people in India who at least occasionally drink alcohol (DARA, 2018). Unlike many Western Countries, the consumption of alcohol, India is witnessing a dramatic rise, and the country has also become one of the largest producers of alcohol. Most urban areas have witnessed an explosion in the number of bars and nightclubs that have opened in recent years. People abuse substances such as alcohol, tobacco, and other drugs for varied and complicated reasons, but it is clear that our society pays a significant cost. Over the last few decades, drug consumption has become one of the biggest problems affecting millions of children and youth worldwide. India too is caught in this vicious circle of drug abuse, with the number of drug addicts growing by the day and the epidemic of substance abuse among the younger generation reaching alarming proportions. Various factors such as changing cultural values, increasing economic stress, and dwindling supportive bonds are the leading causes of substance abuse among adolescents (Sharma, et al., 2017).
In India, besides alcohol and tobacco, cannabis, opium, heroin, and hashish are the most commonly used drugs, mainly among young and predominantly males. The factors that contribute to addiction among adolescents include the desire for new experiences, an attempt to deal with problems or perform better in school, simple peer pressure,

and the desire to carve out their own identity (National Institute on Drug Abuse, 2016). Drug availability and an unhealthy family environment, such as violence, physical or emotional abuse, mental illness, or drug use in the household, can increase the likelihood of using drugs. Even adolescents' inherited genetic vulnerability, personality traits such as poor impulse control or a high need for excitement; mental health problems like Depression, Anxiety, or Attention Deficit Hyperactivity Disorder, and wrong notions about drug consumption can make it more likely that an adolescent will use drugs. Trying drugs, on the other hand, may satisfy normal developmental desires in an unhealthy way that can have serious long-term consequences for adolescents (Sussman, Skara, and Ames, 2008).

Incidence of Substance use among Adolescents:

Adolescents may abuse almost any substance whose ingestion can result in a euphoric ("high") feeling. Alcohol is a commonly abused substance, that can have devastating effects on the physical, economic, emotional, and social aspects of alcoholics. Amphetamines come in many forms, and an overdose of any of these substances can result in seizures and death. An anabolic steroid is a group of substances that are most often abused by bodybuilders and other athletes and can lead to devastating emotional symptoms like aggression and paranoia, infertility, and organ failure. Caffeine is available in the form of coffee, tea, and soda, which can be habit-forming and produce palpitations, insomnia, tremors, irritability, and significant anxiety. Cannabis, known as marijuana, can cause infertility, difficulties with sexual performance, paranoia, and a lack of motivation. Cocaine tends to stimulate the nervous system and can be snorted in powder form, smoked when in the form of rocks, or injected when made into a liquid. Hallucinogens can be dangerous because they alter the user's perceptions, such as when someone jumps out of a window believing they have wings and can fly. Inhalants are one of the most commonly abused groups of substances due to their easy accessibility in the form of ammonia, bleach, and other substances that emit fumes. Nicotine is the addictive substance found in cigarettes, nicotine is actually one of the most addictive substances that exist (Stopper and Edwards, n.d.).

Children and Adolescents experiment with drugs for fun in the company of friends in the beginning, and later they get addicted to them (Goswami, 2015). According to the study, in India, 13.1 per cent of the people involved in substance abuse are under 20 years old, and 63.6 per cent of the drug users seeking treatment were introduced to drugs at a young age (15 years). In recent years, drug use has begun much earlier in life, and drug use has been steadily declining across the country (Jiloha, 2017). The study conducted by the National Commission for Protection of Child Rights, reveals that the most common drugs of abuse among children and adolescents are tobacco and alcohol, followed by inhalants and cannabis. The most commonly abused drugs by Indian children and adolescents are alcohol and tobacco, both of which are gateway drugs for use and addiction. It is estimated that by the time children reach the ninth grade, about 50 per cent of them have tried at least one of the gateway drugs, and every day, 55,000 children in the country abuse tobacco, hail from low socioeconomic strata, and are often victimised by deprivation and discrimination (Daniel, Krishnan, and John, 2017).

Need for the Study:

Substance use is a major issue that affects school-age youth at an earlier age, with many young people starting to experiment with alcohol, tobacco, and other drugs during their middle school years, with a smaller number starting in elementary school. Rates of substance use are remarkably high by the time they reach high school. Adolescence is a time for experimentation and risk-taking, and substance use experiments are common during this time. The consequences of drug use are often multifaceted and not only affect health, education, and occupational careers but also incur a huge financial and social burden on society. Over the last few decades, drug consumption has become one of the biggest problems affecting millions of children and youth in the country. Evidence suggests there are 7,800 new drug users per day, equating to 54.1 per cent of all youth, and 12,500 new alcohol users per day, equating to 59.1 per cent of today's youth. Students are more vulnerable to addiction due to various reasons, such as peer group influence, increased academic pressure, increased popularity, and the easy availability of substances. Students who abuse substances lose interest in activities such as changing eating or sleeping habits, reducing interaction with others, making drastic changes in their studies, getting into trouble with school officials, and getting into legal trouble, all of which have an emotional and psychological impact on addicts and their parents. Substance use by nurses potentially places patients, the public, and nurses themselves at risk for serious injury or death. Asper the study, nursing students are also at risk for problems related to substance use. The present study attempts to understand Perceptions of Nursing Students about the Cause and Consequences of Substance Use, which could provide insight into the level of awareness among nurses about the risks associated with substance use, impaired practice, and drug diversion.

Objectives:

- To understand the demographic details of the Nursing Students;
- Find out the perception of Nursing Students about the causes of substance use;
- Elucidate the participants' views about the effects of substance use on health.

Methodology:

The present study was conducted to understand the perception of Nursing Students about the causes and consequences of substance use of selected colleges in Mangalore Taluk, Dakshina Kannada district. The cross-sectional study attempts to yield the responses of 115 students about the causes of and health effects of substance use. The participants were selected through a purposive sampling technique, and a questionnaire was used to obtain data. Self-prepared, semi-structured questions were prepared to find out the awareness among respondents about the causes and consequences of substance abuse.

Findings & Discussion:

1. **Demographic Details:** The respondents' demographic variables, such as age, gender, place of stay, type of family, parent's education and income, and branch of the study, were collected through the self-prepared semi-structured tool.

Table No. 1 Demographic Details of the Respondents

Sl.No	Variables	Particulars	Frequency N=115	Percentage
1	Age	17 years	27	23.47
		18 years	60	52.18
		19 years	24	20.87
		20 years	4	03.48
2	Gender	Boys	34	29.56
		Girls	81	70.47
3	Branch of Study	BSc Nursing	80	69.6
		General Nursing	35	30.4
4	Place of Stay	Hostel	87	75.7
		Paying Guest	14	12.2
		Staying with relatives	5	4.3
		Home	9	7.8
5	Type of Family	Joint family	19	16.5
		Nuclear Family	78	67.8
		Extended family	18	15.7
6	Father's Occupation	Illiterate	2	1.7
		Primary/Secondary	43	37.4
		PUC	40	34.8
		Graduation	25	21.7
		Post-Graduation	3	2.6
		Technical Education	2	1.7
7	Mother's Occupation	Illiterate	3	2.6
		Primary/Secondary	33	28.7
		PUC	47	40.9
		Graduation	25	21.7
		Post-Graduation	7	6.1
8	Father's Occupation	Unemployed	6	5.2
		Agriculture	33	28.7
		Self Employed	49	42.6
		Private Employee	24	20.9
		Government Employee	3	2.6
9	Mother's Occupation	Unemployed	62	53.9
		Agriculture	17	14.8
		Self Employed	18	15.7
		Private Employee	17	14.8
		Government employee	1	.9

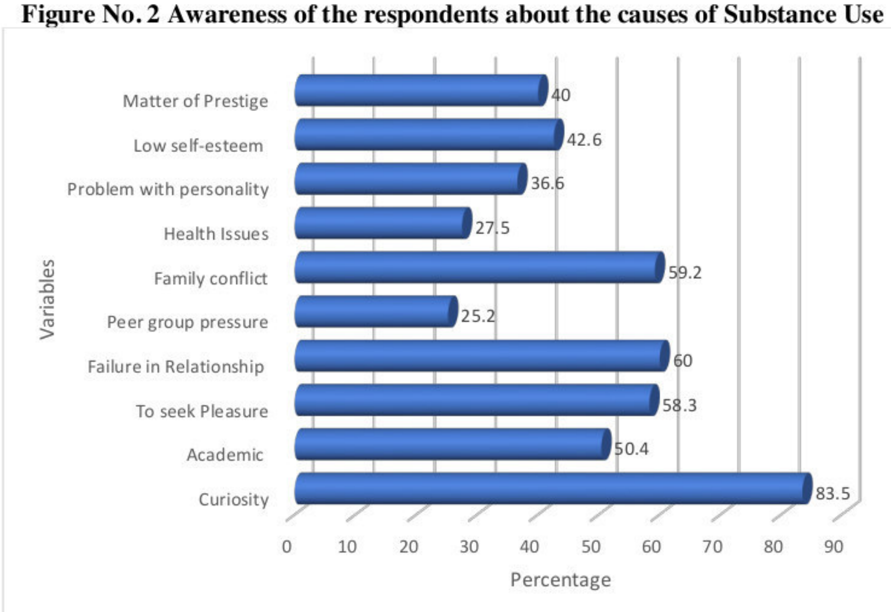
The demographic details of the respondents show that the majority of the respondents belong to the age group of 18 years (52.2 per cent); female participants (70.41 per cent) were found in greater numbers. The majority of respondents (69.6 per cent) opted for BSc Nursing as their career, 75.7 per cent of the respondents stay in hostels, 67.8 per cent belong to Nuclear families, the majority of respondents' fathers completed primary education (37.4

per cent) and their mothers up to PUC (40.9 per cent), 42.6 per cent of respondents' fathers are self-employed, and 53.9 percent of their mothers are unemployed.
Both boys and girls put their lives at risk by abusing drugs and alcohol. However, a recent study shown that even girls abuse substances as often as boys do. Asper the report from NIDA (2020), in the year 2019, 19.5 million females (15.4 per cent) ages 18 or older have used drugs, including marijuana.

2. Awareness of the respondents about the causes of Substance Use:

In order to find out the knowledge of the respondents about the causes of substance abuse, self-prepared semi-structured questions were prepared. The variables such as curiosity, academic pressure, seeking pleasure, failure in relationships, peer group pressure, family conflict, health issues, problems with personality, low self-esteem, and matters of prestige were included.

Figure No. 2 Awareness of the respondents about the causes of Substance Use

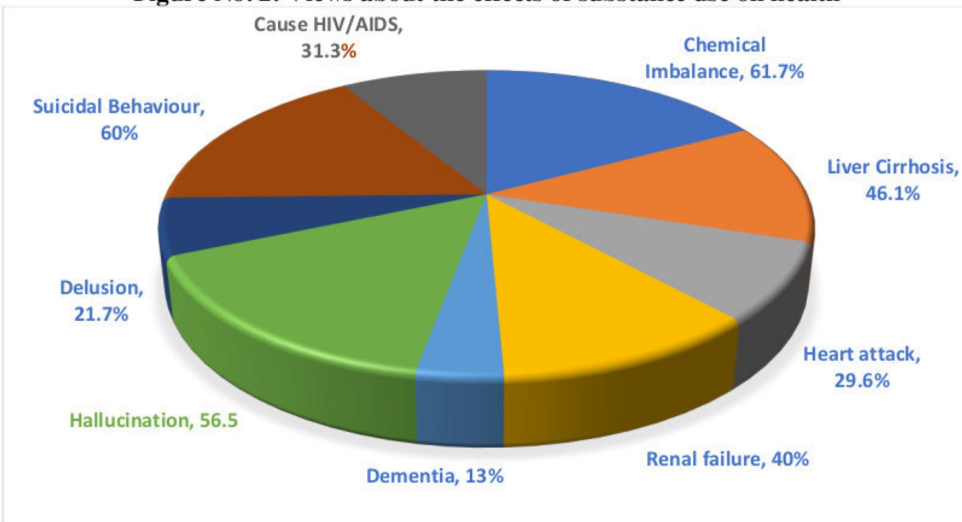


According to the data, 83.5% of respondents believe that people of the younger generation abuse substances out of curiosity, 50.4 per cent believe it is due to academic pressure, 60 per cent believe it is due to family pressure, 59.2% believe it is due to family conflict, 58.3 for pleasure, while 25.2 percent consider peer group pressure is the cause for substance use among teenagers.
It can be noticed from the results that the respondents were unaware about certain areas, such as low self-esteem, personality issues, and peer group pressure can cause substance among adolescents. As mentioned by Alavi (2011), self-esteem plays a meaningful role in the individual's tendency to addiction, where those who have poor self-esteem tend to develop addictive behaviours compared to those who have better self-esteem. Even though there is no standard definition of what an addictive personality entails, there are certain personality traits that can influence people to abuse substances. Traits such as impulsive, risky, or thrill-seeking behaviour; dishonesty or a pattern of manipulating others, low tolerance, anxious and dependent personality; and anti-social personality traits make people prone to abuse substances (Hinders, 2017).

3. Views about the effects of substance use on health:

Knowledge of the respondents about the effects of substance use on health was assessed based on the semi-structured questionnaire, in which variables such as Chemical Imbalance, Liver Cirrhosis, Heart attack, Renal failure, Dementia, Hallucination, Delusion, Suicidal Behaviour and HIV/AIDS were included.

Figure No. 2: Views about the effects of substance use on health



The result shows that 61.7 percent were of the opinion that addiction to substance abuse leads to a chemical imbalance in the brain, and only 46.1 percent of them opined that it could cause liver cirrhosis. The respondents lack knowledge in the major areas such as heavy consumption of substances leads to heart-related disease (29.6 percent), renal failure (40 percent), Dementia (13 percent), Delusion (21.7 percent) and HIV/AIDS (31.3 percent). The result denotes that the respondents lack knowledge about the major ill effects of Substance abuse. Unfortunately, most of the time drug-related injuries or death takes place due to ignorance. The adolescent may not be mature enough to understand the severity and consequence of the ill effects of drug use, due to which they had to lose their life (Hart, 2017).

People addicted to the drug have more chances to develop Delusions which most of the respondents were unaware. According to American Addiction Centre (2019), various mind-altering substances can cause a person to develop various health problems and someone suffering from a delusional disorder may turn to drugs or alcohol to get away from the symptoms, which may actually serve to make them worse instead. The study also denotes that, the respondents were unaware that, people who are addicted to the drug are likely to acquire HIV/ AIDS. People who abuse drugs put themselves at risk for contracting or transmitting viral infections such as human immunodeficiency virus (HIV), acquired immune deficiency syndrome (AIDS), or hepatitis (NIDA, 2019).

Recommendations:

Education about the effects of substance use can help adolescents to understand what substance abuse is; the warning signs of addiction; how alcohol and specific drugs affect the mind and body of an individual; family, relationships, and other areas of functioning. There is a need for imparting information on how to deal with a family member who is addicted to drugs or alcohol, as well as how to be supportive during the treatment process. Since adolescents spend the major part of their day in school, school personnel such as teachers and counsellors play a highly influential role in the life of an adolescent. Therefore, there is a need for educating these stockholders about the causes and consequences of drug use. It is more important for schools and colleges to be concerned with drug demand reduction, drug supply reduction, and mitigating the health and social consequences of drug use, with a major focus on demand reduction. Even parents and siblings of adolescents must be educated on drug-related issues in order to detect and mitigate drug-related behaviour early on.

Conclusion:

The prevalence of substance use among adolescents suggests that prevention and intervention efforts specifically geared toward young people are critical, and specific trends in alcohol or drug use vary a great deal among adolescents over time. Several clinical and school-based evidence-based treatment and prevention efforts have been shown to be effective in reducing adolescent substance use. Parents and role models who consistently establish healthy social norms regarding alcohol and drug use throughout childhood and adolescence set the strongest foundation for preventing unhealthy substance use behaviours later in life.

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"IMPACT OF COVID-19 ON TEACHING-LEARNING EVALUATION OF STUDENTS IN INDIA"

ABSTRACT

Almost 250 million students in India were impacted by the shutdown of schools at the inception of the lockdown brought on by COVID-19. The epidemic presented both public and private schools with a number of difficulties, including an increase in dropouts, learning losses, and the digital divide. Both students and teachers have been compelled to change their approaches and adjust to the shifting demands of the programme of study. It is significantly difficult to design, carry out, and manage online classes on a large-scale in a nation like ours where approximately 70% of the population lives in rural or semi-urban areas with little to no access to ICT-enabled teaching-learning infrastructure. Since many pupils and educators are unfamiliar with this contemporary way of teaching and learning, they must be conscious of both competencies and decorum in order for the educational interactions to be fruitful. Amidst the numerous assertions made by the organization and government agencies, many rural and remote regions of the nation's students lack the network capacity necessary to broadcast online classes in real time, and the virtual memory on their smart phones is insufficient to allow them to retrieve the lectures and televise them whenever they like. The difficulties that students face while studying online and taking online exams in this circumstance are greater than their options. The goal of the current research is to address the difficulties that students can face as well as the creative methodologies and abilities that educators should possess to make such online classes fruitful. The study relies on research done during the outbreak on the effectiveness of online courses for education and learning.

Keywords: Covid-19, Paradigm shift, Teaching-learning strategies, Technology, Challenges, Solutions.

1. INTRODUCTION

It is significantly difficult to design, carry out, and manage online classes on a large-scale in a nation like ours where approximately 70% of the population lives in rural or semi-urban areas with little to no access to ICT-enabled teaching-learning infrastructure. Since many pupils and educators are unfamiliar with this contemporary way of teaching and learning, they must be conscious of both competencies and decorum in order for the educational interactions to be fruitful. Amidst the numerous assertions made by the organization and government agencies, many rural and remote regions of the nation's students lack the network capacity necessary to broadcast online classes in real time, and the virtual memory on their smart phones is insufficient to allow them to retrieve the lectures and televise them whenever they like. During the COVID-19 outbreak, there was a sea change in the teaching-learning approaches as a result of the increasing importance and use of technology in the curriculum at all levels. The teaching-learning method is a multi-step process where a teacher determines specific learning objectives, develops teaching and memorization techniques, implements a work schedule, and evaluates the effectiveness of the lesson. The teaching and learning process is the process of creating an environment in which students can interact and explore their studies. The goal of the teaching-learning process is to transfer knowledge, develop skills, and mould mindsets, beliefs, and behavior. Planning, carrying out, and managing online classes on a massive scale is difficult in a nation like ours where well, almost 70 percent of the citizenry lives in rural or semi-urban areas with little to no access to ICT-enabled teaching and learning infrastructure, and the majority of people cannot afford expensive smart phones and other gadgets to take advantage of the online counseling sessions. When physical gatherings of students and professors are either forbidden or restricted, online platforms like Microsoft Teams, Webex, Google Meet, and Zoom have emerged as the most viable alternatives for holding academic classes in the COVID-19 environment. As many teachers and students are unfamiliar with this new way of teaching and learning, they must be conscious of both skills and manners in order for the teaching-learning interactions to be fruitful. The difficulties that the educators face while running and supervising the online classes in this case outweigh the potential alternatives.

2. REVIEW OF LITERATURE

Since the COVID-19 virus spreads from one person to another through contact, saliva, and other means, several nations worldwide are simultaneously urging their citizens to maintain a social and even physical distance in order to stop COVID-19 from spreading. The world's educational endeavors have also been hampered by this. The operations of educational institutions not only had an impact on business, tourism, and healthcare but also on other industries. In an attempt to prevent the COVID-19 pandemic from spreading, the majority of governments throughout the world have temporarily closed educational institutions. Well over 91% of the learner population worldwide will be impacted by this nationwide closure. Local school closures have been adopted in a number of other nations, affecting millions of additional pupils. UNESCO aids nations in their efforts to lessen the negative effects of school closings, particularly on more vulnerable and poorer groups, and to make it easier for everyone to maintain their education using virtual classrooms. The terrible pandemic known as COVID-19 has had a significant impact on all of humanity. (Andria Pragholapati, 2020) Because of the COVID-19 pandemic's ongoing spread, daily increases in mortality, cessation of life, and unpredictable control period, individuals are emotionally affected by it. Both immediately and later on, this influence will lead to several issues. Once the COVID-19 outbreak is under control, it will be easier to understand the psychological effects on people. In the long run, it is anticipated that the COVID-19 pandemic's psychological issues will affect everyone on the planet. (Muhammed Akat, Kasım Karataş 2020) Considering that the school academic calendar was suddenly disrupted by the earlier unforeseen shutdown of all schools in the country, the study's findings indicated that there is likely to be a decline in the pass percentage of secondary school students in this year's national examinations if the COVID-19 epidemic is not contained in the shortest amount of time. (Edgar John Sintema, 2020). (Nidhi Singh Kavia 2022) discussed that the kids have suffered as a result of the major concerns that have been mentioned, which is COVID-19, including a lack of accessibility, technological challenges, psychological issues, a lack of sufficient training, a lack of support from both parents and teachers, insufficient personal interaction, and a loss of enthusiasm. Pravat Kumar Jena (2020) exemplifies the nation's seamless education. Both COVID's positive and negative effects are explored, and some useful recommendations are made for implementing educational initiatives during the pandemic situation. He further adds that COVID-19 has enforced the world-wide lockdown, creating a very bad effect on the student's life. Around 32 crore students have stopped attending school. All educational institutions are on hiatus. Gurjant Singh, Shana Quraishi (2021) the study came to the conclusion that it is difficult for pupils to study during a lockdown, which is leading to the development of mental stress because of uncertainty about studying, finishing the syllabus, and comprehending the courses. The stress itself may cause more panic, which may force the pupils to make unwise decisions in an effort to escape disappointment or failure. The study also found that pupils' mental learning is being impacted by their lack of physical activity.

This examination of the literature inspired the researcher to investigate the effects of COVID-19 on student teaching-learning evaluations in India and to identify any unmet research needs.

3. RESEARCH GAP-

1. No research has been carried out to determine the teaching and learning evaluation during COVID-19.
2. There has been no research into how the pandemic affected the students' overall well-being.
3. There has been no research into students' attitudes towards education after COVID-19.

4. RESEARCH METHODOLOGY

The study has been based mainly on a feedback survey conducted by researchers of students and teachers from the January 2020 and January 2021 cycles who conducted online counseling sessions. Out of the target population of more than 200 teachers and 200 students engaged in online sessions, responses from 80 teachers and 80 students have been analyzed and interpreted in the study. The structured survey questionnaire included both close-ended and open-ended questions. The close-ended questions for students and teachers included questions on their experience in conducting online counseling sessions, the quality of the audio-visual output in the online classes, the platform chosen for conducting the online class, the suitability of the platform chosen, the academic support given to students for the online counseling session, the scope for feedback, the difficulties faced by the learners during the online sessions, the difference between teaching in a conventional face-to-face class and an online class, extracurricular activities, the mentoring sessions arranged, the conduction of exams, and evaluation of the same.

RESEARCH OBJECTIVES

1. Analyze the effective instructional assessment method that the institute must implement to address the COVID-19 problem.
2. Provide teachers with advice on improving their efficacy in online learning environments so that students are not affected.

SIGNIFICANCE OF THE STUDY

The present study has been undertaken to evaluate the teaching learning evaluation process, which affects the overall wellbeing of students. The study is based on empirical evidence gathered from randomly selected respondents to investigate how the COVID-19 affected students' behavioral aspects towards study in their subsequent academic years.

5. THE EMPIRICAL MODEL

Analysis of Data-

The major findings were that students taking online classes have various kinds of experiences: 78 percent of the students are not happy with the way they attend the classes; 72 percent of the students are not comfortable with the use of technology while taking the classes; and 25 percent don't know how to operate the online platforms and need help from others. Sixty-eight percent of students are not happy with the quality of audio-visual output, and 57 percent of them are not satisfied with the quality of the output due to poor internet connectivity, multiple log-ins, or lower versions of the phones or computers. Eighty percent of teachers use Google Meet, 18% use Zoom, and the rest use other platforms. 35% of students attend the online mentoring classes. 65% of students attend the webinars arranged by institutes. 68% of students are not happy with the online exams, evaluations, and assessment system. 78% of students are happy with the notes provided by the faculty. 48 percent of students are perplexed by the exam pattern and learning material. Students who are comfortable with the new technology find the online classes more enjoyable than the conventional classes; on the other hand, students who are used to learning in the conventional face-to-face classes with the chalk and the blackboard are resistant to the introduction of online teaching. After passing online exams in next year's academic year, 78% of students are suffering from a lack of knowledge and information. They are not able to learn new concepts as they are not clear on the basics of the concepts that they have learned online. Consequently, it becomes very difficult for students to sustain and learn new concepts and to cope with the advanced syllabus in continuing education next year.

CHALLENGES FACED BY STUDENTS DURING COVID-19

Skills required for online learning: Skills in content, design, technology, management, social interaction, communication, etc. are necessary for attending online classes. Some students find it difficult to acclimatize to the online learning environment after spending their academic careers in a traditional classroom setting. Students who have spent their entire academic careers in a classroom find it difficult to focus on the online learning environment at the same time. Students must, however, adopt the new learning environment with an open mind.

Lack of face-to-face communication: E-learning has a wide range of benefits, but it also has certain specific drawbacks. They may become bored or frustrated if an instructor isn't physically present. In addition, they cannot actually perform any tasks, unlike in a typical classroom. The majority of the abilities that teachers spend years developing in a traditional classroom are useless in an online lecture.

Lack of discipline: as pupils are typically out of their control and supervision when learning online, many teachers have difficulties. When teachers notice that their students are not paying attention or are easily distracted while they are explaining something, they may become frustrated. As a result, teachers frequently struggle with maintaining discipline in a virtual environment, in addition to technical difficulties with online instruction.

Distraction Issues in Online Learning: Online education can be incredibly beneficial. It could seem as though the setting is akin to a school. But, things are different at home. You might desire an open classroom, as well as playgrounds, canteens, parks, your friends, and teachers who can serve as mentors and guides. Online schooling, on the other hand, necessitates keeping your parents close by and managing everything from a single location. You are more likely to get sidetracked by domestic issues as a result of these variables.

Continuous Feedback: Both positive and negative feedback is anticipated by students. Students are able to perform better thanks to the instructor's input. Is summative testing the only method used at your institution? Do your students lack discipline or motivation? Maybe there isn't enough constant feedback, which is the problem. Online, where there is a lot of information but no filter to refine it, providing input becomes even more useful.

Lack of Interaction/Motivation/Being Bored: One of the primary issues with online education is that teachers frequently discover that their pupils lack the motivation to learn new things. It can be difficult and depressing for teachers as well when pupils show no interest in learning, studying, or concentrating throughout the session.

Time Management: Online training and in-person lectures cannot be compared on an apples-to-oranges basis. Would you be willing to use the previous online schedule? Do you not have the time to dedicate to online learning? Does your faculty have trouble achieving the desired learning results? Teachers must invest more time and effort if they want to engage students and the course material in new ways.

Connectivity issues: You have the benefit of being able to access online courses from any location. Nevertheless, a lot of students lack a steady internet connection and a device with the capacity or specifications necessary for online courses. As a result, they are unable to actively engage in class due to inadequate bandwidth and internal storage. They consequently fall behind their online classmates, which makes learning difficult for them.

Lack of motivation: Many students show up to class with vigor at first, but as the session goes on, that enthusiasm quickly wanes. Online lessons may seem uninspired to people who have completed their elementary or secondary education in the conventional face-to-face system. Some of these courses have lengthy texts and a lot of multiple-choice questions, which deprive the students of their interests because they don't engage or motivate them. and ultimately they gave up on it.

SOLUTIONS RECOMMENDED FOR THE PROBLEMS FACED BY ONLINE STUDENTS

Forming, storming, norming, performing, and adjourning make up the process. Consequently, it is evident that for a collective effort to succeed, each stage must come before the next. Teachers must oversee each transition in order for collaborative learning to be successful and make sure that all students are on task and paying attention. Following are some solutions to overcome -

Adaptability

Since they are not constrained by a set schedule, students benefit from the freedom to own their learning while using online education options. Online learning allows students more freedom to manage their time than they would in a traditional classroom. Those who work all day and are unable to attend classes in person will also greatly benefit from online learning options.

Virtual experiments and participatory simulations

Students can better learn challenging subjects with the help of interactive models and computer simulations. Also, technology has greatly increased the fun of learning by allowing students to participate in a wide variety of learning activities that also aid in improving idea retention.

Regular evaluations to help curtail unwanted interruptions

The ease and regular examinations that online courses provide are some of their main advantages. In reality, they are crucial to student learning because regular, brief evaluations and tests can significantly increase student engagement when they are interspersed with multimedia content and interactive learning tools.

Provide opportunities for pupils to understand and use the knowledge.

Each module should be designed with the intention of preventing binge-watching by placing stop signals or clear instructions in strategic locations. Giving pupils the opportunity to study and apply the material is what you are doing when you instruct them to do this at the end of each module. Instead of treating this as a simple reading exercise, the goal should be to ensure that the children are truly learning anything before going on. Doing this task before going on to the next lesson is one of the concepts you may use to make your course content a stimulus for action.

Provide discussion opportunities for students.

Including particular spots in the course material where you may encourage discussion by asking students questions about what they are learning is another crucial component for enhancing the online learning experience.

This helps with course completion rates and improves the entire learning experience while also increasing engagement and a sense of community among students.

Several Learning Methods

With online classes, closeness is absent. It's not required for teachers to work with students for seven to eight hours every day. How do they determine which students require extra encouragement? Can teachers confirm that all of the kids are aware of what has to be done? Without this assurance, children run the danger of quitting school, losing interest, and learning less.

Problem-Based Education

You should definitely add problem-based learning to your arsenal of classroom motivational techniques. PBL can aid students in developing their critical thinking, communication, and problem-solving abilities if it is used in the lesson. Additional advantages include developing collaborative skills, knowing more about research procedures, realizing the value of analytical abilities, and working autonomously.

Virtual Field Trips

Virtual field trips would be a fantastic addition to your online classes if you are a biology, chemistry, or history instructor. For your pupils, who often learn through books and written material, academic virtual trips may be appealing. This will be interesting to install and visually beautiful. This experience is available on many websites for historical sites, galleries, museums, etc.

Evaluation of online students

The evaluation process for the students who learned online is a big challenge. To evaluate them effectively 360 degree evaluation is necessary; merely asking them to solve MCQ based questions will not be enough. Online quizzes, essay questions, drag-and-drop activities, online interviews, dialogue simulations, online polls, game-type activities, peer evaluation, and review techniques may be considered.

Provide a reward system for students to subtly enforce discipline.

Implementing an incentive system that would make each student think twice before disturbing class time can help preserve discipline in an online learning environment.

It is an excellent approach to engaging with the children and keeping them motivated to perform at their highest level at all times.

Finding a lively, enjoyable, and interactive online course; providing individualized instruction and training across devices; starting a publicity campaign; establishing a deadline; and sending reminders Students are capable of having productive conversations. It will assist them in mental purification and positive attention maintenance. They may start competing after lectures as well. They'll be inspired to work hard and acquire new knowledge as a result. The use of inventive movies, clever challenges, quizzes, and other interactive teaching methods can help make learning more enjoyable.

6. CONCLUSION

COVID-19 has had a significant impact on India's education industry. Notwithstanding the numerous difficulties it has brought about, numerous opportunities have also arisen. In order to address the current COVID-19 dilemma, the Indian Government and several educational stakeholders have looked into the prospect of open and remote learning. India has not been prepared to use digital platforms to spread education throughout the entire country. The current selection of digital platforms will harm the kids who are less fortunate than the others. Yet, academic institutions and the Indian government are working nonstop to discover a solution to this issue. Using digital technology to give millions of Indian kids a competitive advantage should be the top goal. The necessity for educational institutions to improve their expertise is urgent. Students and faculty are encouraged to enroll in online certification programmes to bolster their educational institutions' IT infrastructure and prepare them for COVID-19-like scenarios. India should come up with innovative ways to guarantee that all children will have ongoing access to education throughout a COVID-19 pandemic. Government practices have caused students who did not take exams in COVID-19 to be placed into the next classes. Then, in order to move on to the following class, students had to take MCQ tests. So, both during and after the COVID-19 pandemic, students lack a general comprehension of core and basic concepts, this affects their enthusiasm for engaging in subsequent classes, their interest in written tests, and their ability to focus. To improve the teaching-learning and evaluation process in schools and colleges, efforts should be made to make up for the students' academic losses. These efforts should include regular revisions, additional classes, remedial teaching for weak students, counseling, mentoring, additional assignments, and case studies all this may helps students to overcome the problems and negative impact of Covid-19.

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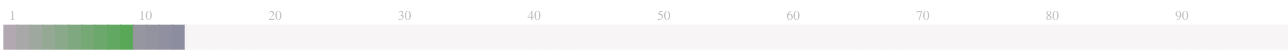

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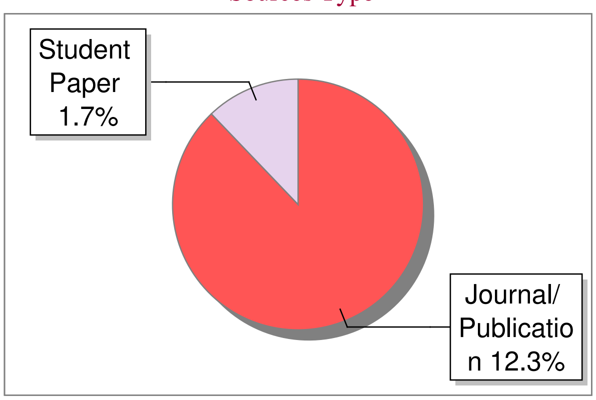

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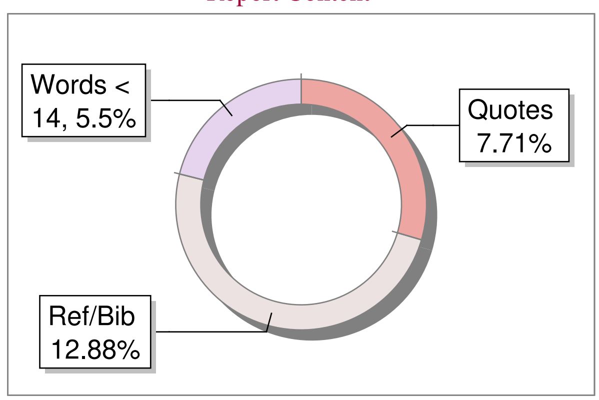

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TRANSFORMING RURAL INDIA THROUGH WOMEN EMPOWERMENT: A STUDY ON THEEMPOWERMENT INITIATIVES OF SKDRDP

Abstract:

The study attempts to examine the performance of SHGs promoted by SKDRDP in uplifting the rural women through its empowerment initiatives and tosuggest policies for achievinginclusive rural development. The current study is relied on primary and secondary information collected from interview, questionnaire, annual reports of SKDRDP, websites and magazines. It is found that a greater extent of SHG membershave actively involved in livelihood and enterprise development programmes so as to have economic independency through which contributing towards rural development. Despite several complexities in the process, SKDRDP has done its best in mobilizing rural women in building their social and economic status by imbibing LEDP initiatives.

Keywords: LEDP – Livelihood and Enterprise Development Program, SKDRDP- Shri Kshethra Dharmasthala Rural Development Project (A renowned NGO of Karnataka State), SHGs-Self-Help Groups, NGOs- Non-Governmental Organizations.

Introduction:

Despite the developmental initiatives of the public sector still a high margin of rural women,continue to be marginalisedand deprived of in accessing their basic amenities thus it has led to the underdevelopment and had suppressed theabilityof rural women to take up their initiatives in rural development. Much number of rural development and people centred programmes have not been successful mainly due to the inefficient institutional initiatives to raise the standards of the rural women. This made to identify the prime role ofNon-Governmental Organizationsand likely to extend their initiatives for the deprived and marginalized womenhabitants of rural India by their noble moves through Self-Help Groups (SHG) to combat poverty and related economic hurdlesby the way of financial inclusion.

“According to Human Development Report (HDR), there is no country that treats women as equal as its men (UNDP 1997: 39). Therefore, women empowerment is essential to the community development process and the inclusion of women in the development stream has been a major government concern ever since independence”.

“The Studies of Carr *et al* (1996), Harper (1998), Dadhich (2001), Suarshan Synghal (2002), Venkatarao (2009), Reddy Narasimhalu (2009), Vimala (2009) and Tankha *et al* (2005), Purohit (2003), Isebelle (2006) and Jayasheela and Palanna (2005) showed that,the involvement of women in women's organisations such as SHG has changed their lives economically, socially and politically. They argue that women's empowerment is positively correlated with SHG microfinance. Ramakrishna and Krishnamurthy (2005) revealed that, SHGs recorded better scores in credit worthiness, banking habits, loan repayments and freed them from moneylenders”.

Research Gap:

Lots of efforts have been made by many NGOs on raising the standards of women byawareness and microfinance activities. But studies have been found less on livelihood and enterprise development programmes of NGOs particularly in women empowerment programmes. Under this concern SKDRDP being a renowned NGO of India doing its best towards women empowerment noble inclusive rural developmentalinitiatives.

Objectives:

The study is confined to the below objectives

- To evaluate the impact of SHGson economic empowerment of rural women.
- To examine the women empowerment initiatives of SKDRDP and tosuggest policies for transforming rural India by sustaining women empowerment through self-help groups.

Hypothesis:

H1: There is a positive correlation between SHGs initiatives on the economic status and the standard of living of the rural women.

Research Design:

The study is confined to DK District of Karnataka State. In the district four taluks namely Suulia Belthangady, Puttur and Bantwal, have been selected and information’s have been mobilised from 240 respondents (60 from each taluk) on the basis of socio-economic variables collected fromboth primary andsecondary data. The study inputs were collected from the interview, questionnaire, annual reports, handbooks on LEDP programmes and websites of SKDRDP.

ECONOMIC EMPOWERMENT

SKDRDP being a renowned NGO in the state has done a remarkable initiative in the study area by bringing a notable changes in the economic lives of the rural women. Therefore, an effort has been made through the study to evaluate the impact of SHG movement on the socio-economic empowerment of women. Under this study it isbeing observed in terms of changes in the members/respondents occupations,income, and in assetsholding before and after joining to Self-Help Groups.

Changes in Occupation:

Change of occupationis an important transformation among the SHGs members through their participation. Table 1Presents data on the percentage of respondents who switched to different occupational pattern after joining to SHGs in the study area. From the table it is clear that 71.25percent of respondents feel their professional structure has changed since then join SHG.This change has made it more self-reliant. It can be seen that SKDRDP has promoted a greater share of respondents to initiatesustainable work so as to have their empowerment thereby contributing towards rural development.

Table 1: Changes in the Occupation

Taluk	**Yes**	**No**	**Total**
Sullia	38	22	60
	63.33%	36.66%	100%
Belthangady	42	18	60
	70%	30%	100%
Putttur	48	12	60
	80%	20%	100%
Bantwal	43	17	60
	71.66%	28.33%	100%
Total	**171**	**69**	**240**
	71.25%	**28.75%**	**100.0%**

Source: Primary Data

Changes in Income:

The above table (table-2) gives an information on the perceptions of respondents whether their income has increased since then accession to SHGs.It is evident from the data that 73.55% of SHG members have opined that their income hasincreased after joining to SHG. It makes us to understandthat a large proportion of respondents are inducedto raise their income levels.

Table 2: Changes in the Income

Taluk	Yes	No	Total
Sullia	40	20	60
	66.66%	33.33%	100%
Belthangady	43	17	60
	71.66%	28.33%	100%
Putttur	50	10	60
	83.33%	16.66%	100%
Bantwal	44	16	60
	73.33%	26.66%	100%
Total	**177**	**63**	**240**
	73.55%	**26.25%**	**100.0%**

Source: Primary Data

Changes in Assets Possession:

This is the another parameter which showcases that sample respondents have been up to better standards after into SKDRDP promoted SHGs. The micro finance and LEDPactivities induced by the groupare also the major part oftheir economic transformation.The data in table-3 showsthe section of sample respondentswho urged that there is an improvement in their asset possession which is estimated about 75per cent.

Table 3: Changes in Assets Possession

Taluk	Yes	No	Total
Sullia	45	15	60
	75%	25%	100%
Belthangady	42	18	60
	70%	30%	100%
Putttur	50	10	60
	83.33%	16.66%	100%
Bantwal	43	17	60
	71.66%	28.33%	100%
Total	**180**	**60**	**240**
	75%	**25%**	**100.0%**

Source: Primary Data

Testing of hypothesis:

- Changes in occupational pattern change the income level

Table 4: Correlations

		Changes in the Income	Changes in the Occupation
Changes in the Income	Pearson Correlation	1	.939**
	Sig. (2-tailed)		.000
	N	240	240
Changes in the Occupation	Pearson Correlation	.939**	1
	Sig. (2-tailed)	.000	
	N	240	240

**. Correlation is significant at the 0.01 level (2-tailed).

From the table-4 it is observed that, the correlation between occupation and income level is significant at the level 0.01 which is highly acceptable in terms of 94%. Which makes us to understand the fact that after joining to SKDRDP promoted SHGs the members income level has significantly improved so that they can lead better life.

- Change in Income has a positive correlation on asset possession

Table 5: Correlations

		Changes in the Income	Changes in Asset Possession
Changes in the Income	Pearson Correlation	1	.924**
	Sig. (2-tailed)		.000
	N	240	240
Changes in Asset Possession	Pearson Correlation	.924**	1
	Sig. (2-tailed)	.000	
	N	240	240

**. Correlation is significant at the 0.01 level (2-tailed).

From the table -5 it is observed that, the correlation between income and asset possession level is significant at the level 0.01 which is highly acceptable in terms of 93%. Which makes us to understand the fact that after joining to SKDRDP promoted SHGs the members asset possession level has significantly raised after involving in various income generating activities by the way of microfinance extended by SKDRDP.

POLICY SUGGESTIONS:

Based on the study,

- It is suggested to conduct awareness programmes on the financial literacy for the members of the groups so as to have institutional knowledge on their financial transactions.
- SKDRDP has motivated its SHGs members to initiate LEDP activities. Priority should be given to marginalised and deprived segment of the society and low economic status people who are out of the groups through community development programs.
- NGOs have to motivate theirstakeholders by transformingoccupational standards.
- Through the LEDP initiatives SHG members have started income-generating activities but they are facing the marketing problem.Hence, a better places tobe identified to market the products. So that the respondents can have access to better markets to sell their produce and thereby they grow in their venture.
- The financial inclusion initiatives of the SHG‘s reached the poor. But efforts should be facilitated to uplift the genuine/marginalisefor which the grass root level workers/officials must be trained to extend their services at the most efficient manner.

Conclusion:

It is evident from the study that NGOshave the potential to validate the far reaching initiatives of the government where it has failed to reach the unreached in the rural areas, especially the rural womenby raising their socio-economic standards through the programs of LEDP. Microcredit provision is not a panacea that will make far-reaching changes in women's lives.There are various issues relating to economic and social matters to be addressed on the process of women empowerment. Such socio-economic hurdles are required to be validated by facilitating adequate institutionalinitiatives of governmentstoo. Then only it’s possible to have rural transformation.

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Digital Literacy Issues in Education After COVID-19

Abstract

The wide spread of digital technology has changed the saying "the man is a social animal into the man is a digital animal." The use of digital literacy skills is very high in the day-to-day activities of human beings. Everyone depended on technology for daily needs, education, and employment. The number of digital literates is more compared to before COVID-19 and after. The education field is very vast and it is influenced by using digital devices very highly. The teaching and learning activities during COVID-19 are carried out through online mode. To engage in virtual mode education both the teaching and learning community need to be digitally literate. The educational institutes provided training for them to use digital devices in regular activities. More dependency on digital technology can lead to health, economic, and social problems which are explained below. The present paper describes digital literacy skills, the advantages of digital literacy, and the core issues of digital literacy in education after the COVID-19 pandemic.

Keywords: Digital Literacy, Covid-19, Education.

Introduction

Technological developments influenced all aspects of human life, as technology gets updated many new things add to the existing technology. The situation is not the same as in ancient days, at that time books are the only source to get information. Nowadays innovations in digital technology brought many possibilities. The information is transferred into online mode, to get any information people started searching in virtual sources. The COVID-19 pandemic has increased the dependence level on digital media. To access information from various internet sources one must be digitally literate. Digital literacy means a person's ability to read, write, search, and locate information through digital media. To access the required information from the internet there is a need for digital literacy skills. The COVID-19 pandemic forced to stop all physical activities of educational institutions, and digital media opened new ways of teaching-learning activities. The applications such as Zoom meet, Google meet; Webex, classroom, etc. are used for online communication. During this situation, many people suffer from a lack of digital literacy skills. Slowly they learned digital literacy skills, now they are very much familiar with the technology. Being Digitally literate facilitates many advantages such as it boosts the confidence of the person, it saves time and money, developing reading and writing skills, improving communication, and providing good navigation skills. Technology is helpful and harmful, and digital literacy also causes many problems. The present study throws light on the key issues of digital literacy, particularly faced by children in education after the COVID-19 pandemic. These issues caused serious problems among youngsters

Review of Literature

The review of related literature gives a complete understanding of the research topic. it helps to know the quantitative developments of the topic and helps to discover the research gap and research trends.

(C.S & R. S Compaña, 2021)conducted a study to know the digital literacy levels of the teachers after COVID-19. Teachers must have digital literacy skills to teach online. They discovered that digital literacy is not a reality it has preferred the teaching-learning process. To adopt new technologies teachers, need a training program that combines the methodology and educational strategies. Similarly, (Kasımoğlu, Bahçelerli, & Çelik, 2022) studied the student's opinions about distance learning during COVID-19 and the problems of digital literacy during the same time. They collected student opinions and concluded that the objective of education is not properly met in distance education. There is a communication problem in online mode for both teachers and learners. The online learning process affects the student's life individually it makes them feel isolated.

(Jovita Lobo, 2021) The COVID-19 Outbreak caused some positive impacts and enhanced digital literacy skills. The education sector became a hub of digital learning, bringing global educational institutions closer. The situation forced them to learn digital literacy skills and web technologies to survive in the present digital age. Webinars enhanced digital literacy skills during a lockdown.

(Udeogalanya, 2022) conducted a study to know how the students are making themselves ready to face the situation and adopting digital literacy skills. Before COVID-19 the online mode of education was optional it was not fully practised only 20% of classes run online. The computer science community was ready with digital literacy and the other people they are not much aware of using digital technology. After COVID-19 there is a need to give training in the use of Computer and digital literacy skills.

(Martzoukou, 2020) says the instant shifting from offline to online mode has brought out many restrictions in the higher education system. The complex problems such as the Adoption of remote tools, online teaching-learning, accessibility, and equity. The COVID-19 situation forced the education community to think beyond the box. The libraries act as the connecting links which help the system to move forward.

Concepts used:

Digital literacy

Definition- UNESCO defines Digital Literacy is the capacity to define, retrieve, control, incorporate, connect, Examine and generate information securely and suitably with digital technologies and networked devices for participation in economic and social life. (UNESCO, 2018)

(Martin, 2008) defines Digital Literacy as being engaged in recognizing digital resources and content, reaching, controlling, coordinating, analyzing, and synthesizing, developing new paths for media expression, and making it available to communicate with others.

Origin

The concept of Digital Literacy is the first time hosted by Paul Gilster in his book "Digital Literacy" in 1997. He described it in simple words, it is the capacity to comprehend and utilise information from different digital sources which is known as literacy in the digital era. Gilster did not mention the list of literacy skills. Before him, many other authors used the phrase "Digital Literacy" during the 1990s. (Bawden, 2008)the brief information about digital literacy is;

- Aware of interpretation and grasping of non-successive and active material.
- Bringing consciousness to People networks as a source of advice and help.
- To control incoming information use filters and agents.
- Accessing the information, publishing, and communicating is based on comfort ability.
- Making aware of the values of traditional tools along with networked media.
- Assembling the information from different sources and creating a "knowledge assembly."
- Skills related to the retrieval of internet information and critical thinking about them. There should be proper skills to judge retrieved information and internet sources.

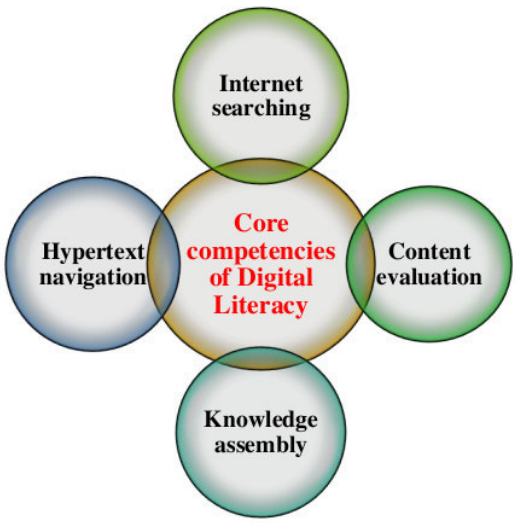

Figure.1 Core competencies of Digital Literacy (Gilster, 1997)

Digital Literacy Skills (Aviram & Eshet-Alkalai, 2006)

Aviram and Eshet-Alkalai explained five types of digital literacy in their article "Towards a Theory of Digital Literacy: Three Scenarios for the Next Steps"

1. Photo-Visual Literacy-Knowledge to understand from illustrations: this skill is essential for the users to easily read and know commands and communications that are staged in an optical–graphic form. This skill is useful for understanding the coded text and playing computer games in which information is presented through symbols and icons.
2. Imitation Literacy- the skill of imaginative replication: this is a new skill necessary for modern digital literates. It is the ability to generate new definitions by combining different forms of media such as; text, graphics, or sound. This skill is necessary for the fields like writing and art.

3. Splitting Literacy- multimedia and retreating or namouras field thinking in modern days navigation is through non-linear hypermedia technology. Splitting literacy is the capacity to navigate effectively in a non-linear system. This skill inculcates the new possibility or capacity to build psychological models, notion charts, and representations of the web's arrangement.
4. Information Literacy- the skill of continuous cross-examination of information: the information explosion realized the importance of being information literate. Sorting information from plenty of resources is a big challenge. The information literacy skill is the capacity to access, place, measure, and significantly assess the information available on the web or shelves in libraries. Information-literate peoples are critical thinkers; they usually do not accept information without questions they always look with doubt. This is an important skill to survive in the digital era.
5. Socio-emotional literacy: the modern digital age opened new doors of opportunities, the learners are seeking information from a variety of sources like information distribution, conversation crowds, information societies, and chat areas. These skills enable users to share formal knowledge and emotions with the help of digital communication media. This skill is a very compound one; to share emotions on social media users have to be critical, analytical, and mature and need should be a good hold on information, Splitting, and photo-visual literacy skills.

COVID-19

COVID-19 is a disease produced by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). This disease was found in Wuhan city of China in December 2019. The China government was unsuccessful to control the disease and it spread to other countries in Asia and around the world. The World Health Organization announced a public health emergency at the global level on 30 January 2020 and a pandemic on 11 March 2020. As of 7 December 2022, the number of total cases is larger than 646 million and 6.46 million confirmed deaths("COVID-19 pandemic - Wikipedia," n.d.). The COVID-19 symptoms include common fever, dry cough, and extreme tiredness. It spreads along with the air while taking a breath in air polluted by drops and small aerial components which include the virus. The pandemic has caused many Social, Economic, and educational threats all over the World. The COVID-19 epidemic brought many challenges for the education field, government ordered to close of physical classes and a shift over to online mode/ Virtual education. This was very challenging for the teachers, institutional heads, state officials, and students (Daniel, 2020).

Advantages of Digital Literacy

The COVID-19 pandemic realized the importance of being digitally literate, online mode/ Virtual mode is the only way to communicate with users and students. Some of the advantages of digital literacy are listed below(Mudra, 2020);

- Improves digital reading and writing skills.
- Improves digital Listening and speaking skills.
- Helps with digital collaborative work.
- Access Authenticate resources/ effective content searches.
- Digital literacy boosts students' commitment.
- Recovers the educational presentation.

- It assists students to stand strong during competition in the job market.
- Digital literacy saves time and Money.
- Helps for better decision-making.
- Digital literacy provides Real-time updates.
- Helps to become a digital citizen.
- For lifelong learning.

Issues of Digital Literacy

Digital literacy after COVID-19 caused many problems in society. It affects all types of users based on their information needs and age group. According to the various studies conducted by different authors worldwide, digital literacy affected more on children and adults rather than age-old people. Some issues of digital literacy are as follows;

1. Risk on children's behaviour- the awareness about digital literacy among children affects on their social behaviour, children have less control over them. This is because of the freely available information there are no restrictions on the use of information for age groups, and the information which is available on the internet can be accessible to everyone. This may cause serious problems like cyber-kidnapping and cyber-bullying. The children will not feel to mingle with family and friends they always like to be In front of digital media. To outcome of such cases, the parents and teachers need to provide proper education regarding the use of online resources properly(Purnama, & Ulfah, et.al 2021).
2. Lack of using educational methods- in online classes the teachers are not able to use all the educational methods which are used in offline physical classes. There is a restriction on the use of methods and no provision for group discussion.
3. Not an effective alternative to the traditional education process – the online /video classes are not effective compared to the physical class. There is no proper contact between the teachers and learners.
4. No time for self-education- in the virtual mode of education the teachers need to create electronic educational materials, they take much time to prepare online educational content. According to some studies, it takes exactly double time for physical education content.
5. Lack of productive interaction with students- digital literacy can be the cause of non-productive interaction through the online learning process.
6. Lack of flexibility in conserving traditional knowledge- digital literacy medium is not flexible to hold the importance of traditional education(Almazova, Krylova, Rubtsova, & Odinokaya, 2020).
7. Economic problems- the biggest challenge after COVID-19 is the economic crisis many people's lost their job, and livelihoods. At the same time in education fields, there is a need for Gadgets for distance education. To purchase them for their children many people's suffered a lot.
8. High risk of Addiction- technology is very much helpful for the teaching and learning process in education, but at the same time, it increased the risk of addiction among children. In the last three years, we found that the young generation is addicted more towards online games and social media. This has increased during the lockdown time.

9. Health Issues- too much use of digital devices can cause serious health issues such as mental illness, and eye problems, and sitting in the same place from morning to evening can increase the fat level of a person.
10. Lack of using collaborative teaching methods- in online teaching a teacher cannot use collaborative teaching methods. The teacher cannot make a group of learners in virtual mode.

Conclusion

Technology is a boon as well as a bane; it depends on how we make use of it. Digital literacy is a concept which is very helpful for learners; it brought many changes in all areas of human life. In modern days it is a compulsion to be digitally literate, one must know how to use the internet, search strategies, usage of social networking sites and many more. The use of digital technology created many opportunities during the COVID-19 pandemic. Almost all fields started using digital technology to communicate with their users or learners, the internet become their workplace. After the COVID-19 situation, digital literacy becomes a necessity to survive in this competitive world. Everything should be in control if we lost control over using digital media then it starts to control us, in the same way, many youngsters lost control over the usage of digital devices. Digital literacy caused many problems which are mentioned above; it brought psychological illness among the youths. Digital literacy is associated with many fields like information and data literacy, conversation and association, media literacy, establishing online information, online security and digital comfort, clearing the issues, analytical thinking and inventions with online instruments and technology(Martzoukou, 2020).The concept of digital literacy made easy communication and helpful for conducting online classes but it cannot bring the effectiveness/seriousness which we find in a physical class. Sometimes students will not be physically present in front of the device, they just log on to the class and move. There is no interest to teach effectively or learn, many teachers feel that it is difficult to make understand the concept in an online class. The addiction to digital devices continued from during COVID-19 to after the COVID-19 pandemic also. The present study focussed on the issues which arise after COVID-19 in digital literacy.

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Factors affecting customer satisfaction with Ola Cabs services with reference to Mysore City

Abstract

Due to a significant number of recent entrants who run private cab businesses in addition to the country's current public taxi market, the taxi industry in India is rapidly growing. While the public taxi market has cabs that are too old and have little to no comfort or security, the private taxi market offers taxis that have features like GPS that offer more comfort and security. In order to monitor the effects of private taxi firms on the public taxi market and to understand the effects of the private taxi industry on the overall public taxi market, we conducted this researchutilizing precise variables.These elements have been considered in light of the normal elements a customer could consider when debating booking a taxi. A company's profitability and long-term competitiveness are commonly viewed as being dependent on how well its products are received by customers. Yet, the few empirical research that have been done in this field indicate that there is little to no likelihood of early romance between these ideas.

Keywords: Taxi, Customer satisfaction, Ola, Public, profitability.

1. INTRODUCTION

India has a sizable and diverse shipping industry. It all started with a simple transportation system at first. It has even been referred to as "human civilization's most defining picture" by others. Delivery links are a net benefit in terms of the environment, economy, and overall well-being. Several people's lives have altered as a result of a large population, which has led to an increase in the necessity for transportation. This expanding industry in many sectors, including private and public transportation, has demonstrated that customers are willing to pay more for superior services even if they were initially displeased with them. A simple tap on a smartphone can now be used to request a taxi thanks to the development of technology. Cities will be able to improve their operations, infrastructure, and power by using sensors and technology. These app-based taxi services have enormous promise in densely populated nations like India. Parking is a big problem due to a lack of accessible space and public transportation is backed up during rush hours. People are looking for taxi services that offer a nice and opulent trip in addition to a quick form of transportation in cities all over the world. This research seeks to show a few minor aspects that will influence customers to use Ola software since it is being sought after to learn how customers perceive city taxi-hailing services and the level of perseverance(Velmurugan et al., 2019).

The geographic reach of Indian cities expands as the country's population rises and more people relocate from rural to urban areas. The supply of taxi services on the market can be kept current with the aid of modern technology. All of these elements, particularly the Ministry of Tourism's steadfast commitment to promoting India as a top tourist destination and the advent of BPO services, have aided in the industry's explosive growth. In order to better understand how e-hailing services are affecting the taxi sector, this study will look at how satisfied Ola customers are with the service. A key method of transportation with a reach unmatched by any other contemporary mode of transportation in today's global market is avenue delivery. There are alternative possibilities like employing a cab service or flagging down a taxi on the side of the road. You won't have to worry about your next destination or how long it will take you to get there. It benefits to commerce, industry, and business in general. Taxi services make it easy to navigate about town. Both public taxi stands and private organizations that offer on-demand taxi services are available in cities. All personal property, including bags, late-night flights, and tolls, belong to the passenger alone(Tiwari, 2019).

The Indian taxi industry is anticipated to grow at a CAGR of 13.7% over the following five years and reach a market value of around ₹14.3 billion. Taxis are becoming more and more popular because they offer hassle-free transportation as well as other concrete and intangible advantages, including the option to book through a smartphone app, air conditioning in the vehicle, and competent and knowledgeable drivers. Ola has received assistance in creating a long-term development strategy from seasoned investors including Softbank, Tiger Global, and Ratan Tata. a ₹8.5 million Series B investment.

My April 2011 investment, Ola, raised ₹404 million on its own in 2017. In the near future, India's passenger car market is expected to experience a major increase in domestic taxi capacity, which might support a medium- to long-term boom, according to a recent ICRA research. The taxi market in India is anticipated to expand at a double-digit rate over the next two or three years because to the high demand and increasing penetration of such players in smaller towns. Fleet sales, which include aggregators of car-hire services, represented for 9% of India's PV sales in FY2016. In FY2022, fleet sales are anticipated to make up 15% to 17% of all PV sales.It is projected that India's low rates of car ownership and the country's underdeveloped public transportation system will increase demand for taxis.

Carpooling, taxi hailing, and peer-to-peer ridesharing are all available through Ola Cabs (stylized as OL), a ridesharing service established in Delhi, India. The company was established by ANI Technologies Pvt, Ltd., based in Bengaluru, Karnataka, India. Ola's market worth was projected to reach ₹10 billion in October of this year. A number of venture capitalists, notably Softbank, hold the company. Weekly taxi usage among monthly active consumers has increased, the business claims in a statement. In an effort to maintain momentum, Ola has been offering Share Pass, a subscription-based service, since November of last year. For the first 8 kilometers, there are additional fees that vary from Rs. 249 for 20 rides to Rs. 349 for 40 rides per month. (Management, 2020). The cost of group outings won't rise for past members. Since last year, the company has experienced a surge in demand from Delhi and Bangalore, which has been viewed as a successful marketing tactic for customers who are concerned about costs. In Bengaluru, auto-rickshaws will also be tested. After a successful testing phase, Ola Car launched operations in cities including Delhi, Pune, Chennai, and Hyderabad in December 2014. In January 2018 Ola arrived in Australia, and in September of that same year, it arrived in New Zealand. Ola introduced auto rickshaws in March 2019 when it debuted its UK service. When the London event began, more than 10,000 drivers had registered both online and offline. When Ola's ride-hailing service launched in February 2020, over 25,000 drivers had already registered(Khatoon et al., 2019).

2. LITERATUREREVIEW

(Nikam et al., 2020) The study focuses on brand awareness and customer satisfaction with Mysore Ola Taxis are examined in this study. Consumers in Mysore who are interested in using Uber and other private transportation services like taxis now have an incredible logo image in their minds. Customers prefer Ola cabs for a variety of reasons, including their well-known brand, usability, affordability, punctuality, speed, safety, and ability to pick up and drop off customers everywhere in the city. The growing popularity of Ola and the satisfaction of its customers underpin its taxi business.

(Nallasivam & C, 2021) Their study uncovers the efficient supply chain for Ola Cabs services as well as the criteria they used to choose service providers for comfort, cost, and convenience as well as the caliber of their work and level of customer service. This will serve as a crucial piece of information for service providers to learn how satisfied their customers are with their service and how frequently they use our services. The results are an exact representation of the customers' attitudes and levels of satisfaction with the service providers managing Ola Cab users in Whitefield Bangalore. The right recommendations were given after taking the facts and viability into account.

(Nallasivam & C, 2021) The study focuses onthe most significant performance metrics that have been found are dependability, tour speed, and customer satisfaction for traditional taxis. According to the findings of a 30-day study, Ola cabs provide better service than regular taxis. For the Indian market, similar research has been conducted. We looked at the price, sales techniques, and market share aspects of the Indian taxi sector.

(Nallasivam & C, 2021) Additionally, each nation's government, through its Department of Transportation, has a variety of methods it manages the taxi industry. The best and most practical way to get around Mysuru's bus and train stations, airports, and other locations is by taxi service. In Mysuru, call taxi services are typically available four hours a day, with between 50 and 60 enterprises operating in the city and its environs. Many consider it to be the most practical form of transportation as a result. Under this regulation, the government may place various restrictions on the sports offered by the industry, ultimately aiming to improve services for the general public. The main goal of this is to raise awareness of call taxi services and the challenges that individualshave when utilizing call taxi services.

(Nadu, 2021) This study aims to investigate the factors that affect consumers' decisions regarding taxi services. Statistics can prove conclusively that there is a correlation between reliable, unbiased variables. Customers are interested in using coupons while selecting taxi services, the report claims. According to the report, customers are content to use coupons while making taxi reservations through mobile applications.

(Khurana, 2013) Their study reveals that businesses must always innovate and think of fresh approaches to get customers to purchase their goods. Consumers are king, thus Ola should concentrate on winning them over by making their services more goal- and customer-centered while remaining adaptable to changes in governmental regulation. On the other hand, managing an Indian market without a strong brand loyalty is challenging due to the sophistication, trauma, and price sensitivity of Indian consumers. India is one of the most dynamic nations in the world thanks to its extensive market and rising purchasing power.

(Kalla & Purohit, 2017) The business employed an attractively designed service presentation to communicate with its target demographic while leveraging electronic advertising. To demonstrate how the model presents the advantages of the service, they employ Ola's marketing initiatives. In this article, a theoretical framework is developed for comprehending how a provider may improve as a carrier that excels in electronic advertising. A recent study found that customers are interested in using coupons to gain discounts on cab rides and are comfortable using mobile apps to do so. This demonstrates the value of service businesses across all industries. Ola thinks that in order to gain a larger market share, it must employ extremely innovative strategies, which are based on the findings of its own research.

(Shukla et al., 2017) Reveals a World Economic Forum report claims that every other day, a new green taxi service operator in India is introduced. In this study, a comparison of Ola, a cab aggregator that has dramatically changed the daily commutes of the renowned Indian middle class, was made. The possibility that India is undergoing a taxi revolution raises the question of whether this is actually the case. Ola cabs are currently expanding their business and gaining a clientele in the city of Mysuru.

(Velmurugan et al., 2019)stats that It's time for Ola to increase their knowledge of new locations. Ola has grown considerably in the taxi showcase market. The revenue of Ola has increased by a factor of 10 or more during the past few years. Because they offer clients so many options, app-based taxi services are reportedly growing in popularity in the Indian city of Mysuru, according to Ola. According to the authors, self-service cell technology might give commuters access to a variety of information via technology. The survey also discovered that customers are generally satisfied, which is good news for the company's future expansion and development.

3. OBJECTIVE OF THE STUDY

- To evaluate how satisfied customers are with Ola cabs' services.
- To discover more about how comfortable and satisfied customers are with Ola cab services.
- To research the variables affecting customers' satisfaction with Ola cab services.

4. STATEMENT OF THE PROBLEM

- In the past, brand equity, customer satisfaction, and brand focus have received significant attention in relation to long-lasting products and services in both urban and rural settings.
- In terms of personal mobility, there hasn't been much research on the relationship between brand emphasis and customer pride.
- The goal of this survey is to find out if Mysuru residents are aware of the Ola taxi brand and what they think about using it.
- This article may also cover using non-public transportation taxi companies to develop a brand and foster client loyalty.

5. SCOPE OF THE STUDY

- Ola's cab offerings were examined, specifically with regard to the city of Mysuru.
- The investigation aims to identify the general activities related to paid taxi services and the client behaviour around the taxi services.
- Client satisfaction and desire have a significant impact on how well a service turns out for its customers.
- A check at the level of customer satisfaction obtained from Ola cabs was also conducted.
- This paper is meant to be educational in nature, giving more knowledge about every useful facet of paid taxi services.

6. HYPOTHESES

In order to achieve the objectives of the study, the following hypothesis was examined:

H1: User happiness and app design/UI have a substantial relationship.

H2: The Comfort of the Trip and Client Satisfaction Have a Significant Relationship.

H3: The relationship between price and customer happiness is considerable.

7. LIMITATIONS OF THE STUDY

The findings of this study are primarily based on research conducted in the city of Mysuru. Future research on OLA cabs may broaden its focus to encompass the entire state of Karnataka or another state with a sizable population of participants. Also, it's possible to draw comparisons between private transportation providers like Uber and Meru taxis. They would like to invest more time and energy in their community as a whole. The drivers and the dispatcher are not in constant contact. Pricing is a concern for this taxi firm. The examination is best suited for instructional purposes. They are limited to just the city of Mysuru and one provider agency (i.e. Ola).

8. RESEARCH METHODOLOGY

The researcher has taken on a project that explains the characteristics of the population or presents the responses to queries about where, when, and how they relate to a subject or field. In order to conduct this study,residents of Mysore city were polled regarding their opinions of Ola cabs' customer service, supply chain, and loyalty. 250 respondents provided the full response. Hence, data analysis uses their data. For data gathering, a convenient sampling strategy has been used. Based on the literature research, demographic factors are included. To determine the expectations of the user and their choice for OLA cabs, a factors analysis technique is used.

9. DATA ANALYSIS AND INTERPRETATION

Demographic description of respondents (N=250)

	GROUPS	FREQUENCY	PERCENTAGE
GENDER	Male	110	44 %
	Female	140	56 %
	18-21	28	11.2%
AGE	22-25	86	34.5%
	26-40	114	45.8%
	41-60	17	6.8%
	60andabove	05	1.7%
	Student	49	19.6%
OCCUPATION	Workingprofessional	24	9.6%
	Privateemployee	63	25.2%
	Governmentemployee	40	16%
	Self-employed	57	22.8%
	Homemaker	09	3.6%
	Unemployed	06	2.4%
	Retired	02	0.8%
	Dependent	38	15.2%
INCOME LEVEL	Lessthan10,000	13	5.2%
	10,000–15,000	19	7.6%
	15,000-25,000	86	34.4%
	25,000andabove	94	37.6%

The above table interprets that majority of the respondents in thestudyarefemalerespondentswhichis56%andtheremainingrespondentsweremalerespondentscomprisingof 44%in thestudy.There are 11.2% of respondents aged 18-21, 34.5% aged 22-25, 45.8% ofrespondents aged 26-40, 6.8% aged 41-60, and 1.7% aged 60 and beyond, as seen in the graphand table above. A majority of responses fall within the 26-40 age bracket, according to these statistics.

15.2 percent of respondents are considered dependents. 52% of those surveyed had a monthly income between ₹10,000 and ₹15,000, 7.6% had one between ₹15,000 and ₹ 25,000, and 34.4%, or 37.6% of those surveyed, had a monthly income of ₹ 25,000 or more. These results demonstrate that the vast majority of persons surveyed are employed and make enough money each month to maintain themselves. Most respondents to this study make more than ₹ 25,000 a month.

19.2% of respondents use cab services infrequently, compared to 42.8% of respondents who use them daily, 7.6% of respondents who use them twice a week, 17.6% of respondents who use them on the weekends, 12.8% of respondents who use them once a month. We may thus conclude from this that the majority of respondents use cab services daily because they Favour other modes of transportation for their rides.

Ola cabs are comfortable, according to 31.6 percent of respondents, 61.2 percent of respondents, 6.8 percent of respondents who are neutral about their opinion, 0.4 percent of respondents who disagree, and 0 percent of respondents who are dissatisfied. That is what we can infer from the statistics, which demonstrates that a large majority of respondents think Ola offers enjoyable trips. 1.2% of respondents agree with their assessment of the value for money of the rides offered by ola's cab service, while 10% are undecided. regarding the value for money of the ola service, 36 percent of respondents agree strongly, while 1.2% disagree. the remaining 1.6% of respondents strongly disagree with the statement. we may therefore conclude from this that the vast majority of respondents concur that ola's cab service offers its customers rides that are both affordable and reliable.

Data can be used to determine how satisfied Ola Cabs customers are overall. While 6.5% of respondents are unclear of their perspective, 53.2% of respondents are happy with their opinions on fair fares. Only 1.2 percent of respondents voiced dissatisfaction with Ola Cabs' overall services, which were commended by 39.1 percent of respondents. According to the findings, 0.8% of respondents are extremely unhappy with the statement. We can therefore conclude that most respondents were satisfied with Ola Taxi Services' overall performance.

CORRELATIONS:

Correlations

		customersatisfaction	**Comfortof the Ride**	**Price**	**Appdesign**
customersatisfaction	**PearsonCorrelation**	1	.909**	.934**	.881**
	Sig.(2-tailed)		.000	.000	.000
	N	248	247	248	247
Comfortofthe Ride	**PearsonCorrelation**	.909**	1	.911**	.884**
	Sig.(2-tailed)	.000		.000	.000
	N	247	249	249	248
Price	**PearsonCorrelation**	.934**	.911**	1	.912**
	Sig.(2-tailed)	.000	.000		.000
	N	248	249	250	249
Appdesign/UI	**PearsonCorrelation**	.881**	.884**	.912**	1
	Sig.(2-tailed)	.000	.000	.000	
	N	247	248	249	249

****.Correlationissignificantatthe0.01level(2-tailed).**

As can be seen from the above table, there is a strong positive correlation between the ride and customer happiness, with a projected value of r= 0.909 and a p value of 0.000, which is less than 0.01. Given that the value of r= 0.934 and the p value of 0.000, which is less than 0.01 show a high positive correlation between the price and customer happiness, as well. The value of r= 0.881 and the p=0.000, which is less than 0.01 show a positive moderate association between app features and customer satisfaction. The majority of correlations of Ola taxis in the study's overall findings All three of the study's chosen factors have been determined to be correlated.

REGRESSION:

VariablesEntered/Removed			
Mode 1	**VariablesEntered**	**VariablesbRemoved**	**Method**
1	Appdesign/UI,ComfortoftheRide,	.	Enter
	Price[b]		
a.DependentVariable:customersatisfaction			
b.Allrequestedvariablesentered.			

ModelSummary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std.Errorof theEstimate**
1	.945[a]	.893	.892	1.31358
a.Predictors:(Constant),Appdesign/UI,Comfortofthe Ride,Price				

According to the above table's study, the extrinsic variables that are utilised to pinpoint the variables influencing customer satisfaction help us explain 88% of the equation with a R square score of 0.893 and an adjusted R square score of 0.892. The study's majority regression co-efficient for Ola cabs and overall regression model findings indicate that all three of the study's factors—app features, ride quality, and price—are impacting consumers' decisions about which cab services to use. Price and Ride are discovered to have a substantial and favourable relationship. According to the study, consumer price, ride, and app features are linked to their influence while selecting cab services.

ANOVA

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	**Regression**	3478.755	3	1159.585	672.030	.000[b]
	Residual	417.570	242	1.725		
	Total	3896.325	245			
a.DependentVariable:customersatisfaction						
b.Predictors:(Constant),Appdesign/UI,Comfortofthe Ride,Price						

It is clear from the above table that the regression model is significant because the value of $p < 0.05$.

majority ANOVA of the study's Ola cabs' regression coefficient. According to the study, consumer influences on cab service decisions include price, ride quality, and app features.

CO-EFFICIENTS

Co-efficients[a]						
Model		**UnstandardizedCoefficients**		**Standardized Coefficients**	t	Sig.
		B	**Std. Error**	**Beta**		
1	**(Constant)**	4.060	.590		6.878	.000
	Comfortof the Ride	.422	.070	.322	5.992	.000
	Price	.902	.095	.583	9.539	.000
	App design/UI	.097	.083	.064	1.175	.241
a.DependentVariable:customersatisfaction						

According to the analysis of the above table, the relationship between the Ride and customer satisfaction is significant because the p value is less than 0.05 and the p value for the Ride is 0.000. The association between Price and customer satisfaction likewise demonstrates a significant relationship, with a p value of less than 0.05 and a p value of 0.000 for Price, respectively. However, there is no statistically significant correlation between customer satisfaction and app features, as indicated by the values of $p>0.05$ and $p=0.813$, respectively. Customer satisfaction of co-efficient provides the estimated regression equation of Customer Satisfaction on specific Independent Variables of the Study.

RELIABILITY TEST

Scale:ALLVARIABLES

CaseProcessingSummary			
		N	**%**
Cases	**Valid**	246	98.4
	Excluded[a]	4	1.6
	Total	250	100.0
a.Listwisedeletionbasedonallvariablesin theprocedure.			

ReliabilityStatistics	
Cronbach'sAlpha	**Nof Items**
.976	20

The scale used for data collection underwent a reliability test to determine its dependability. The reliability of the created questionnaire was evaluated using the Cronbach's Alpha index. The study used 20 items, and the overall reliability score was 0.976, meaning that the variables are reliable and suitable for further investigation. Majority Overall reliability statistics from the study that included all three factors that were chosen for the study show that Ola cabs are reliable.

HYPOTHESES	RESEARCHHYPOTHESES	RESULTS
HA;(AlternateHypothesis)H_1	ThereisasignificantrelationshipbetweenAppdesign/UIand Customersatisfaction.	Accepted
HA; (AlternateHypothesis)H_2	ThereisasignificantrelationshipbetweenComfortof theRide andCustomer satisfaction.	Accepted
HA; (Alternate Hypothesis) H3	There is a significant relationship between Price and Customer satisfaction.	Accepted

10. FINDINGS

- According to the interpretation, it was discovered that the majority of respondents were men and that there were relatively fewer women.
- Among these, the bulk of responders are between the ages of 22 and 25, indicating that they are either postgraduate students or freshly hired working professionals.
- The respondents' occupations, with the majority of them (25.2%) falling under the category of private employees and the remainder falling under other work categories.
- The majority of the respondents are from the dependent income group since the majority are students, and the second majority of respondents are from the income group with a monthly income of Rs. 25,000 and above.
- Hence, the vast majority of respondents are pleased with the service offered by Ola cabs. To increase client happiness, it is believed that Ola cabs still need to undergo significant modifications.
- According to the research's findings, a correlation analysis revealed that Ride and Price had a strong positive link because their respective r values were 0.909 and 0.934.
- According to the research's findings, regression analysis shows that there is no evidence of a significant association between the other three variables—ride, price, and app features—and customer happiness, as shown by a p-value of 0.05 or above.

10.1 CONCLUSIONS

One of the most revered emblems of modern civilization is the automobile. Our needs for upscale medical care and transportation change as the world's population rises and our lifestyles change. This is made feasible by the flexibility, rapidity, and safety provided by many modes of transportation.

Good delivery links immediately benefit everyone: individuals, organisations, the environment, and the overall economy. Customers who are satisfied are more likely to stick to their spending limits, and their ability to choose products well is a solid indication of what other consumers want to buy.

While facing a formidable opponent in Uber, Ola's cab services are doing well in the Indian markets. Clients of Ola are really pleased with the service that has been added by them. They believe the prices are a bit high for the economic climate, but they are generally pleased with Ola's service innovation and discounts and offers.

Consumers are generally dissatisfied with trip cancellation fees. Last but not least, clients prefer Ola cabs over Uber cabs for their travel due to the general characteristics of the service provided by these vehicles. The remarks stated in the document and requested by the respondents are ones that they are quite happy with.

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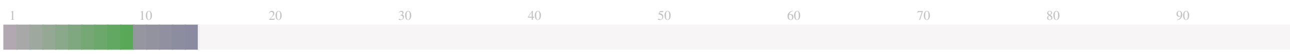

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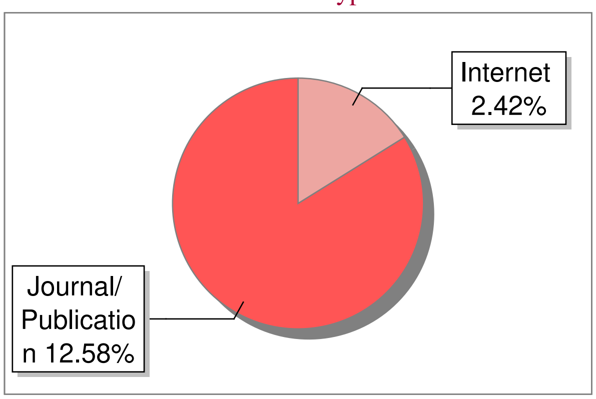

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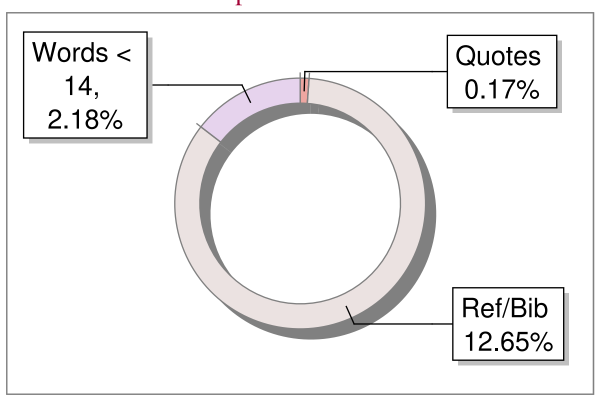

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Women, Peace and Security Agenda: A Critical Analysis of United Nations Security Council Resolutions

Abstract

Women, peace and security agenda is a broad framework of objectives set by the United Nations Security Council Resolution 1325 of 2000 and subsequent nine resolutions adopted by the Security Council since then. The agenda is based on the idea that armed conflicts affect men and women disproportionately. The Women, Peace and Security agenda advocates for the role of women in conflict prevention, conflict management, conflict resolution and post conflict reconstruction. The agenda has immensely influenced the gender related norm diffusion at the international level in the last two decades. The present article has critically analysed the related ten United Nation Security Council resolutions. The study analysed the resolutions at the two levels first at the theoretical level, the narratives set by the resolutions and second at the implementation level. The study used the qualitative content analysis of primary sources like resolution documents and National Action Plans devised by the various countries for theoretical analysis. The study relied on both primary documents of National Action Plans and secondary literature built around the implementation of the resolutions. The study suggests several shortcomings at the theoretical level and also many challenges at the implementation level. The study will help to promote gender equality and women's empowerment in conflict situations and provide insights to policy makers, practitioners and scholars working in the field of Women, Peace and Security.

Keywords: Conflict resolution, Gender equality, Women, Peace and Security, UNSC resolution, Peace keeping, Peace building

Introduction

Peace and security have been the major concerns of mankind since the advent of human civilization. Conflicts affect men and women disproportionately. Women and girls' experience of armed conflicts is different from that of men and boys. Women are much concerned about peace and security but women were not considered as the agents in establishing peace and security. Conflict prevention and resolution must include women's voices. Fourth World Conference on Women held at Beijing in1995 first acknowledged the impact of conflicts on women and role of women in peace and security. The United Nations Security Council (UNSC) Resolutions 1325 of 2000 set the new agenda in this direction. The resolution called for protection of women and girls in conflict situations and participation of women in Peacekeeping, peacemaking and peace building to achieve long lasting peace and security. After the first resolution UNSC has adopted further 9 resolutions which spell out the details for the implementation of the Women, Peace and Security (WPS) agenda.

Anderlini, S. N. (2007) in her book comprehensively analysed the role of women in peace building and she affirms for the achievement of sustainable peace women' participation is crucial.**True, J. (2012)** in her work examined violence and armed conflicts from a political economy point of view. She argues economic causes are important for violence against women and are to be addressed first**. Cockburn, C. (2013)** in her work analysed the gendered nature of conflicts and their impact on women and girls also need for peace building with the equal participation of women. **Chinkin & Kaldor (2013)** in their research analysed the impact of new wars on women and girls and the gendered nature of these wars and argues for the gender mainstreaming in conflict resolution women's involvement on equal footing is necessary. **Enloe, C (2014)** says the foundational resolution 1325 is a landmark achievement but argues women's marginalisation is continued because of lack of political will in its implementation. **Shepherd, L. J. (2016)** in her book examined the legal provisions for WPS agenda in international law and analysed the role of international legal provisions for the promotion of women's participation in conflict resolution and peace building. **Davis, S. E. (2016)** examined the implementation of WPS agenda in the Darfur conflict of Sudan and analysed the challenges faced in protection of women and girls in the conflict. **Higate, P. (2017)** analysed the impact of masculinity in global politics and its impact on peace building. The book further argues there is a need to challenge masculine norms in conflicts and promote gender equality. **Otto & Reisinger (2018)** in their book explained the WPS agenda in detail and examined its implementations in various countries and highlighted the lack of political will in its implementation**.**

From the above literature review it is clear that there is no comprehensive analysis of WPS from the point of view of UNSC resolutions. The little analysis found has only pointed towards the lack of political will. Hence there is a need for comprehensive analysis of the WPS agenda with reference to UNSC resolutions. This paper will critically analyse these UNSC resolutions and their implementation in the last two decades. The paper uses qualitative content analysis for this purpose. The analysis is based on the primary literature like documents of UNSC resolutions for theoretical analysis and it relies on both primary sources, like National Action Plan documents and secondary sources developed around the WPS implementation for analysis of implementation of the agenda. In the first part the paper will underline the conceptual understanding of WPS agenda and the major UNSC resolutions in that direction. In the second part of the paper the WPS agenda will be analysed from the point of view of theoretical aspects of WPS resolutions and also its implementation.

Women, Peace and Security (WPS) Agenda

WPS agenda is the broad framework of UNSC resolutions which aim at ensuring the protection of women and girls in conflict situations and participation of women in all aspects of peace and security processes. The WPS agenda is set on the idea that armed conflicts have a disproportionate impact on men and women and women need special protection during the conflict situations. Further the agenda delves on the argument that women can bring novelty and longevity to peace efforts. The WPS agenda focuses on gender mainstreaming for effective conflict resolution by including gender perspective in all policy areas from peacekeeping, peacemaking and after-conflict peace building. WPS agenda set out by the UNSC resolution 1325 adopted on 31st October 2000. The resolution is considered as a foundation (Miller et al, 2014) to WPS and on this resolution further nine resolutions have been adopted by the UNSC since then. The subsequent resolutions further strengthened gender mainstreaming in peace and security, effective participation of women in peace building and creating awareness about sexual and gender based violence during armed conflict. The overall framework has strengthened the national and international efforts to achieve gender sensitive approaches in conflict prevention and peace building worldwide (Della Valle and Piras, 2022)

United Nations Security Council Resolution (UNSCR) 1325

UNSC Resolution 1235 is the first and most important resolution of the WPS agenda. It is an 18 paragraph document adopted by UNSC on 31st October 2000. The resolution focuses on five major areas which are considered as basic pillars of WPS agenda resolution (Olsson & Gizelis, 2013; Kirby & Shepherd, 2016). The five areas of action are Participation, Protection, Prevention, Relief and Recovery, and mainstreaming gender perspective. (Miller and etal, 2014).

1. **Participation:** The resolution mandates for equal participation of women in all decision making positions at all levels in conflict resolution and peace building. It stresses on women's equal participation in the peace negotiations. Women should be provided equal opportunity in peacekeeping operations as police, as soldiers and policy personnel.
2. **Protection:** The resolution calls for protection of women and children in armed conflict on priority basis. The resolution acknowledges rampant prevalence of gender based violence in conflict resolution and calls for its end. The protection should be extended to humanitarian works like refugee camps.
3. **Prevention:** The resolution advocates for prevention of gender based violence against women and girls during armed conflicts. The crimes against women should be dealt with strict measures and calls for inclusion of these crimes into the crimes against humanity. These crimes should not be covered under any amnesty agreements.
4. **Relief and Recovery**: The post conflict relief and recovery activities should be seen with a gender lens. The needs of women and girls should be met in relief activities. The refugee camps and settlement areas should be treated as civilian humanitarian places and it also calls for sufficient funding of these humanitarian activities.

5. **Mainstreaming Gender Perspective:** Gender perspectives should be added to all policy areas of peace and security. Women and girls' needs are to be prioritised in all stages of implementation of the resolution. Policies should be sensitised with the appointment of gender advisers (UNSCR, 2000; UN Women, n.d).

Subsequent Resolutions of UNSC

After the 1325 resolution UNSC has adopted nine resolutions till date. These subsequent resolutions called sister resolutions of 1325 address various areas of WPS agenda and its implementation. The first of these is Resolution 1820 (2008), it calls for ending of sexual violence as means of war and advocate for stressing on more women peace keepers. Resolution 1888 (2009) focuses on implementation of measures suggested in previous resolution and stresses for judicial response to violations of human rights of women and girls. Resolution 1889 (2009) demand for women's leadership for post conflict reconstruction. Resolution 1960 (2010) calls for ending impunity for the violators of human rights of women and girls and it stresses on robust reporting mechanisms of gender based violence. Resolution 2106 (2013) first acknowledged the impact of armed conflicts on men and boys and it calls for establishment of women and girl centres services at refugee camps. Resolution 2122 (2013) calls for better coordination between UN agencies, national governments and civil society organisations. Resolution 2142(2015) advocates for inclusion of UNSC resolutions into the national action plans of countries. Resolution 2467 (2019) calls for special support for the survivors of sexual and other gender based violence during the conflicts. It advocates strict mechanisms of reporting and punishing the sexual violence during conflicts. Resolution 2493 (2019) is the last UNSC resolution of the WPS agenda. It calls for the UN to prepare context specific implementation plans and create a safer environment for peace activists, human rights activists and political leaders working in the field (UN Women, n.d).

Critical analysis of UNSC resolutions of WPS

After the adoption of UNSC Resolution 1325, there was a rapid spread of norms related to gender mainstreaming at the international level. The foundational resolution of 2000 has brought the horror of experience of women and girls during the armed conflicts to the discussion at the international level (Cohn et al. 2004). The subsequent nine resolutions have acknowledged the need for protection of women in conflicts especially from coordinated sexual violence. In recent years the efforts are seen as 'Half full and half empty glass" (Miller et al, 2014). On the backdrop of this in this section the WPS resolutions are critically analysed. For the analysis purpose WPS resolutions are divided into two parts. In the first part, the first and most important resolution numbered 1325 is analysed and in the second part subsequent resolutions are analysed.

- **Conflict management than conflict prevention:** UNSC Resolution 1325 works on pillars like prevention, protection, participation and post conflict reconstruction and advocates for the role of women in these areas. The United Nation was created to prevent the war and the Security Council's mandate is to prevent the wars and maintain the peace. But the resolution focuses on conflict management rather than conflict prevention. The resolution stresses for involvement of women in peacekeeping operations and peace negotiations. It neglects both pre war situations and post war situations. The resolution is not clear about how women are instrumental for prevention of war where it mentions prevention war is one of the pillars. Post conflict situation is the stage where women need more support but this area was neglected. Physical safety was addressed more rigorously and ignored other areas of security. These shows the short term goals are given more importance than the long term solutions. This undermines the most basic purpose for which the UN system was created (UNSC, 2000).
- **Root causes of war and armed conflicts are neglected:** The resolution 1325 didn't address the root causes of armed conflicts. International security structure and powered gendered relations are major causes of conflicts (Sullivan, 1994). Uneven distribution of power in the international system is not addressed. Masculine hegemony is reflected in international relations which disturbs peace. The resolution depends on existing military structure to establish peace. Soldiers are peacekeepers and addition of women soldiers cannot alter the existing security system in an effective way. Soldiers whether men or women have to work under the same system which perpetuated conflicts for ages. Demilitarisation and disarmament could only be the long term solutions for peace (Chowdhury Fink – Davidian 2018). For sustainable peace these structural causes need to be addressed. Physical security is sustainable only when social, economic and environmental securities are addressed (Basu – Corfontini 2016).

- **The narrow understanding of Gender**: The resolution 1325 is confined to women although it mentions gender in its text. Other gendered minorities like LGBTQ+ are absent in its provisions. Like women, other gendered minorities are also more vulnerable in conflict like situations. They also need the same protection during conflicts and support in post war reconstruction. The document is only concerned about women (UNSC, 2000). This foundational resolution also doesn't bother men and boys. Men are invisible in this main document. Men were treated as a single group and considered all as perpetrators of violence against women and their vulnerability ignored. The peace and security is complete and sustainable only when it includes men, boys and other gendered minorities along with the women.
- **Stereotyping of women's qualities and role:** Further the 1325 resolution affirms the traditional stereotypes by considering women as vulnerable and men as protectors. It puts women and children in the vulnerable category as Cynthia Enloe suggested "womenandchildren" as a single and innocent category (Enloe, 1990). Reasserted masculinised as protectors and feminised protected (Willet, 2010). It neglects the women's agency extended by the resolution itself. It also considers women as a single unit and neglects intersectionality among women (UNSC, 2000). Gender is not the only factor affecting women in armed conflicts. Women's race, caste, economic conditions also affect them on the severity of conflicts. Effect of conflicts on white, rich women is not the same as black women in poor countries. To effective peace and security intersections should be considered.
- **Instrumental approach for gender mainstreaming:** The resolution takes an instrumental view of gender. It neglected the right based approach. Women are considered as instruments to achieve another end that is peace and security. The rights of women as human beings are neglected (UNSC, 2000). Further this confines women to traditional characters like calm, peaceful, nurturing etc. It believes women's innate values can add to the peace building. Women as an individual having their own rights and freedoms were not considered in the resolution (UNSC, 2000). It is assumed that women can bring traditional power based institutions like army and police to respect human rights.
- **Non binding nature of resolution:** The language used in the text of resolution creates the confusion about its abidingness on states and its enforceability. The words like "requests", "encourages" "urges" and "calls upon" (UNSC, 2000) makes it propositional rather than binding. There are no accountability mechanisms set in the document. There is no timeframe provided to states to prepare the action plans. Countries are very slow in adopting National Action Plans (NAP). UNSC is basically a law enforcing agency of the UN. It has the power to recommend. But the resolution has not used that power. It relies on voluntary actions by the states.

Subsequent Resolutions: What has changed?

The subsequent resolutions include nine sister resolutions of 1325 passed by UNSC from 2008 to 2019. Content analysis of these resolutions shows there is shift in the narratives of WPS agenda. First shift can be noticed is recognising women as positive agents of transformation rather than just participants in the peace process (UNSC, 2009a). There seems some concern for sustainable positive peace through health, education and socio-economic development (UNSC, 2009b). The resolution 2122 is progressive document in these subsequent resolutions. This resolution shows the need for protection of human rights of women, establishing rule of laws and legal services to the conflict survivors. It addresses the issue of gender essentialism by focussing on the intersections among the women. The resolution further focuses on the rights of women stressing the need for reproductive and health rights of women affected by the wars (UNSC, 2013). Continuing the progressive nature of the WPS agenda resolution 2242 addresses the changing nature of conflicts. It focussed on emerging areas of conflicts like terrorist attacks, stressed the need of different strategies for the prevention of such conflicts. The resolution also holds that socio-economic and political empowerment of women is an effective way for conflict prevention. Further this resolution wants to make the peace process more inclusive by including men in the process. The resolution number 2106 also mentions the involvement of men and boys in the peace building. The resolution 2242 could also be a road to address structural causes of violence like militarisation and armament. This resolution has a more balanced approach for peace building.

Although these newer resolutions showed a much progressive approach to peace and security, these resolutions also, like 1325, focus more on participation than prevention (UNSC, 2009). The hegemonic masculinity of UNSC is continued in these resolutions. Further these subsequent resolutions give importance to prevention of sexual violence during armed conflict which lead to less focus on long term goals (UNSC, 2008, 2009, 2010, 2013a). Instead of focussing on the long term goal of 'abolishing war' the resolutions focussed on short term goals on how to protect women and girls in the war.

Implementation

Implementation is a crucial stage for any policy or programme. The responsibility of implementing the WPS agenda is on national governments. National governments have to prepare National Action Plans (NAPs) for the implementation. So far 103 countries have formulated their action plans. Implementation of the UNSC resolutions can be analysed based on the NAPs and the literature developed around the implementation for the last two decades.

Preparation of NAPs is very slow. Even after two decades the NAPs have crossed the mark of total membership of the UN. Still 90 UN members have not progressed anything in this direction. There is uneven distribution over the formulation of NAPs. Scandinavian countries and Europe are leading the NAP formulation. Denmark was the first country to formulate its plan in 2005. The formulated NAPs have many flaws. There are only a few countries that have revised their NAPs. Many countries have not put any time frame for the implementation and not devised any accountability mechanisms. NAPs are also not comprehensive. The plans are more concerned about making war safer for women and not aim at long term goals like prevention of war through demilitarisation and disarmament. The socio-economic progress of women is less concerned in these NAPs (Miller et al, 2014).Further, state centric bureaucratic systems cause the implementation very slow (Miller et al, 2014). The countries have given stress on protection of women, prevention of sexual violence more importance at the cost of long term goals like political participation, maternal health etc. Participation of women in peacekeeping is below expectation. Out of 125000 peacekeepers only 3 percent are women (Gizelis – Olsson 2015). Women are considered as an instrument for other goals than giving importance to their rights. Post conflict reconstruction and recovery pillar of WPS agenda has given least importance in the implementation.

The Road Ahead

WPS agenda has made unprecedented diffusion of gender norms at the international level. Feminist Foreign Policy, adopted by Sweden first in 2014, is based on the WPS agenda and deeply influenced by UNSC resolutions. Till date eight countries have adopted Feminist Foreign Policy after Sweden. The WPS agenda could be a leading light for future policies aimed at gender equality and empowerment of women. Implementation of the agenda needs to be taken care of with well devised accountability mechanisms. Civil society organisations can play an important role in holding the authorities accountable. There is also a need to create awareness about the agenda among women all across the globe. Social media can be a fruitful means for this.

Time to time review of the progress should be made. The reports should be publicly available. Tabling the review reports in the national parliaments is one good mechanism for this. National Action Plans should take care of the local needs of women. Implementation of NAPs should be decentralised. NAPs can be included in regular national policies of governments. Financial support should be streamlined through mechanisms like gender budgeting. Use of information and communication technologies should be strengthened to tackle bureaucratic 'red-tapism' in the implementation.

Conclusion

The Women, Peace and Security agenda has played a vital role in bringing the horrific condition of women and girls in armed conflict situations in front of the world community. Previous literature has brought some shortcomings and achievements of the agenda. This paper critically analysed the UNSC resolution numbered 1325 and nine subsequent resolutions adopted by the UNSC in the last two decades. The article highlights the theoretical and implementation challenges of the agenda. Further the study suggested various shortcomings in theoretical representations of women's issues and also some deficiencies in the strategies to implement the UNSC resolutions. Future research is suggested on the ground level impact of agenda especially in the conflict driven third world countries. It is crucial for the United Nations to address these challenges and make the peace and security of women realisable. Efficient coordination from the UN to national governments and non government organisations need to be ensured for meaningful impact on ground.

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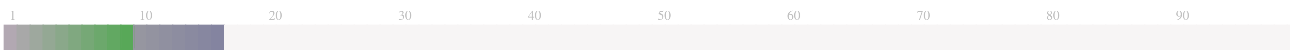

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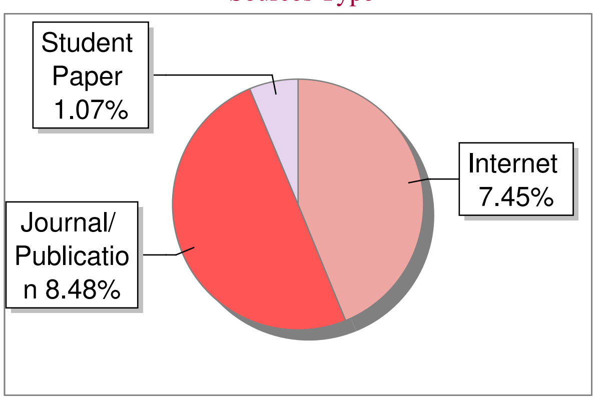

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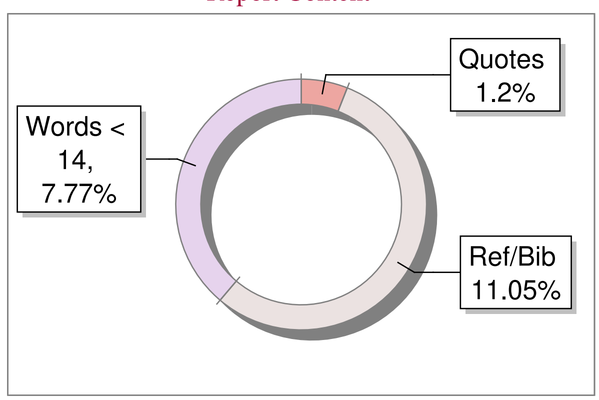

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Adaptive Multi-Path Link Quality Routing Protocol (ALQR) for Multi-hop wireless networks

***Abstract*— A MANET is a collection of mobile nodes connected by wireless technology. Historically, routing strategies for wireless ad hoc networks have focused on identifying paths with various connection quality metrics, including minimal hop count, RSSI (received signal strength indication), SNR (signal-to-noise ratio), and BER (bit error rate). However, such paths might have slow or lossy links, which would lead to low throughput. A routing algorithm can select more effective routes by explicitly taking into account the wireless networks' quality. The PSR (Packet Success Rate) statistic, however, is a helpful coarse-grained statistic for describing network quality because it depends heavily on packet size and transmission rate. A number of techniques, most notably the Dynamic Source Routing (DSR) protocol, have been suggested for improving the link quality. The PSR (packet success rate) and delay link quality parameters serve as the foundation for the adaptive multi-path Link Quality Routing Protocol that we offer in this study. The load-distribution protocol is flexible. The protocol will gather data on the link's quality during the route discovery phase, use it to identify a group of disjoint paths, and distribute data based on the QoS each path offers. To offer the necessary QoS, each node is responsible for keeping an eye on the connections and adding or removing paths as necessary. Simulation experiments will be carried out using the NS-3 network simulator. The proposed method's performance will be contrasted with that of the conventional DSR.**

Keywords: - link quality measurement, MP-DSR

1. INTRODUCTION

A group of nodes that are connected to one another without the use of infrastructure or a base station is known as an "ad hoc network." Because the nodes in such a network are unrestricted in their ability to enter and exit the network, migrate, and organize themselves, the topology of the network is subject to unpredictable shifts. Ad hoc networks have the potential to be utilized in a diverse array of applications, such as mobile battlefield communications that make use of disposable sensors that are dropped from great heights and then dispersed across the ground to identify dangerous chemicals [1].

Because of recent changes in wireless technology, mobile wireless device innovations are becoming more and more popular in both academic and professional settings.

Within the following generation, it will be important to have a quick deployment of autonomous mobile users. They first appeared in use in the 1970s, and since then, they have gained increasing popularity in the network industry. They make it possible for mobile users to have access to information and communication no matter where they are. The goal of mobile ad-hoc networking is to ensure that mobile wireless networks are able to function in a robust and efficient manner by incorporating routing capabilities into mobile nodes. These types of networks are meant to feature energy-constrained wireless connections that are organized into dynamic multi-hop and multi-path topologies. At times, these topologies can change unexpectedly and quickly. To support this form of host mobility, address management and protocol compatibility changes are required. However, key network activities, such as hop-by-hop routing must continue to rely on pre-existing routing protocols that operate within the fixed network. On the other hand, the purpose of mobile ad hoc networking is to extend mobility into the world of autonomous, mobile, and wireless domains in which a set of nodes, which may be combined routers and hosts, function independently of the network routing architecture. This is possible because mobile ad hoc networking uses wireless domains rather than traditional wired ones.

The majority of today's ad hoc routing systems prioritize hop count while making route selections. Several examples of this would be the Ad-hoc On Demand Distance Vector (AODV) [2, 3], the Dynamic Source Routing (DSR) [4, 5], and the Destination Sequenced Distance Vector (DSDV) [6]. On the other hand, routes selected only on the basis of hop count may be of poor quality. This is due to the fact that routing algorithms do not take into account links of poor quality, which are frequently utilized to connect to distant nodes. The signal-to-noise ratio (SNR) of these networks is often low, which causes frame error rates to be higher and throughput to be lower.

In the standard DSR protocol, a set of pathways is generated; however, only one path is utilized for packet transmission, and the remaining paths are stored in the source buffer for eventual use in the event that the link fails.

The DSR does not take into consideration any requirements that are discontinuous. There are two distinct kinds of disjoint pathways, which are known as node disjoint paths and link disjoint pathways. Node-disjoint paths are those in which the intermediate nodes in each path do not share any connections with the other created paths, while link-disjoint paths are those in which a link linking two nodes does not share any connections with the other generated paths.

[1] offered a technique for improving the existing on-demand routing by constructing a mesh and giving multiple alternative routes without sending any more control messages. This would improve the existing on-demand routing significantly. They carried out simulations of the performance gains after putting the technique into practice via ad hoc and on-demand distance vector testing.

[2] AODV-ABR and AODV-ABL are two other approaches that have been suggested as viable options. We are able to boost the adaptability of AODV-BR to topology changes by making some modifications to the routing protocol. The AODV-BR problem can be fixed with these two possible methods. AODV-ABR may construct an alternate route by overhearing not only RREP packets but also data packets, whereas AODV-ABL combines the benefits of AODV-ABR and local repair before analyzing the performance increase through simulation. AODV-ABR may construct an alternate route by overhearing not only RREP packets but also data packets.

[3] The authors of this work offer ARPM, a protocol that maintains good performance by adapting the routing process to the mobility of nodes. This study also discusses how ARPM was developed. Both a proactive and a reactive strategy are utilized in the execution of this operation. In order to compute routes to all of the available destinations, routing information is routinely sent across the network using proactive routing protocols. This helps to ensure that no destination is missed. On the other side, reactive routing creates routes only when those particular routes are needed. When ARPM is first activated, it will begin to take proactive action anytime the mobility degree is greater than a predetermined threshold. Simulations are used to evaluate the performance of the suggested method, and the results are compared to those obtained using DSDV and AODV.

[4] I suggested a QOS-based routing protocol as a means of constructing a QOS route. This protocol takes into account end-to-end delay and energy efficiency in addition to the DSR route-finding approach. This protocol makes use of source routing in order to reduce channel overhead and boost its level of scalability. Additionally, a more effective approach for identifying QOS settings is provided by this protocol, in addition to an energy-efficient route and an improved system for route management. The results of the simulation indicate that the proposed system is superior to DSR in terms of performance.

[5] A unique adaptive routing system for MANETs called AODV-LRT has been proposed (AODV with Local Repair Trials). If the destination has a TTL value that is lower than the maximum TTL value, a local repair mechanism will be employed to fix a broken link locally at the upstream node that is experiencing the link failure. The overhead in message routing that was imposed by the original AODV-LR (AODV Local Repair) algorithm is reduced thanks to the implementation of this protocol. When compared to AODV, this results in higher throughput and lower latency.

[6] The authors of this paper presented an adaptation of the DISTANCE algorithm called ADISTANCE, which stands for "Adaptive DISTANCE." This method was developed to function in a network that uses synchronous communication, which means that every node in the network communicates with the others that are located within a specific radius. In order to facilitate the operation of the DISTANCE algorithm within an asynchronous communication network. We suggested an adjustable separating distance.

[7] AMBR, which stands for "adaptive monitor-based routing," is a system that the authors of this paper suggest. AMBR is designed to route a packet using Monitor and repair a route on the fly as soon as it becomes damaged. This eliminates the need for flooding the entire network. As a consequence of this, the study that we have been conducting discovers and maintains routes in a hierarchical and distributed manner while simultaneously restoring the link on a local level.

[8] The authors of this study propose something called QoS ASR, which stands for "QoS-Based Adaptive Source Routing." This method takes into account QOS concerns like link transmission delay, available bandwidth, packet loss rate, and network state-related limits like battery life, link stability, and node congestion state. Simulations are used to look at the results of the suggested method and compare them to the results of the DSR method.

[9] According to the authors of the study, LQER (Link Quality Estimation-based Routing) is a combination of two different ideas: the dynamic window notion (m, k) and the development of a minimal hop field. A "dynamic window" is a sliding window that remembers data from previous connection exchanges and stores it so that it can be used to evaluate the trustworthiness of a link. This protocol takes into account both energy and the quality of the link in order to prevent poor network connectivity and reduce the risk of retransmissions. This protocol is more scalable, uses less energy, and has a greater success rate when compared to older connection-quality methods. Additionally, it has a lower failure rate.

[10] The quality of a link can be evaluated based on four primary criteria, which the writers have outlined for the reader. RSSI stands for "Received Signal Strength Indication," while SINR stands for "Signal-to-Interference Plus Noise Ratio," PDR stands for "Packet Delivery Ratio," and BER stands for "bit error rate" (bit error rate). They suggest that PDR is an effective metric because it enables a coarse-grained assessment of connection quality, which is one of the reasons why it is effective. In addition to this, other crucial considerations include the packet size and the transmission rate.

There will be fewer link failures in node-disjoint routing than in link-disjoint routing because in link-disjoint routing, even if a link fails because of a dead battery, the failed node can still participate in any other routing paths. This means that there will be fewer link failures in node-disjoint routing.

After providing an on-demand method for searching for highly node-disjoint pathways, the next step for us is to split the packets over these pathways and either add or remove the pathways revealed based on the quality of service improvements brought about by our research. We do a simulation analysis on the suggested method using NS-3, and we compare the findings to those obtained using the conventional DSR. The remaining portions of the paper are structured as follows: The multi-path DSR based on link quality estimation is discussed in the second half of this report. In Section 3, we provide a concise summary of the predicted results. A conclusion is presented as the final part of the fourth segment.

2. *LINK QUALITY ESTIMATION BASED MULTI-PATH DSR*

According to our literature review, the majority of contemporary ad-hoc routing protocols use simple criteria for route selection. Although it is simple and intuitive, certain critical capacity aspects have been overlooked. To begin, each node has a unique traffic load. As a result, the average number of packets in the queue and the corresponding queuing delay at each node vary, and nodes with more active neighbors may experience more collisions. If the quickest route contains some of these heavy nodes, even if the number of hops is small, the end-to-end delay may be larger. Furthermore, if one of the heavier nodes becomes congested, significant packet drops and retransmissions may occur.

In this paper, link quality calculation is based on PSR (*Packet success rate) and Delay.*
PSR at each node i will be calculated by the formula given in [5] i.e

RREQ broadcasting is the same as traditional DSR broadcasting, except that instead of sending RREQ to all neighbors, we can send only the RREQ that matches the QOS condition.
When an RREP is made, the Redirection field is set to true if the generated path is a separate path that also meets the QOS metric constraint for the stored paths in the destination node, and false otherwise. 17
When an intermediate node gets an RREP, if the redirection field is set to true, it sends it to the next node in the RREP path. If the redirection field is not set to true, it searches the cache table for the highest computed QOS metric path with a first hop that is different from the first hop of the RREP path. The flow chart is described in fig 1.

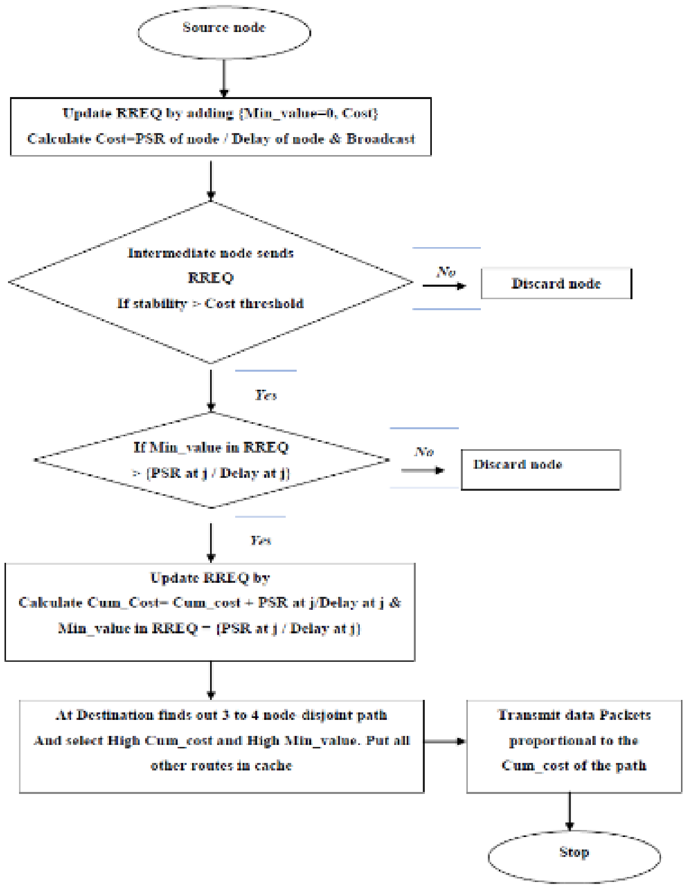

Fig1. Cost-aware node disjoint multi-path

When a source receives a RREP, it will create traffic proportionate to the RREP's cost value. If the cost of path 1 is 50, path 2 is 100, and path 3 is 150, then the number of packets in path 1 is x/n, the number of packets in path 2 is 2x/n, and the number of packets in path 3 is 3x/n, where n is the total number of packets to be delivered.

3. SIMULATION ENVIRONMENT

We implemented multi-path DSR in the most popular simulation environment, NS3. The IEEE 802.11 Distributed Coordination Function serves as the simulation's MAC protocol. We will compare multi-path DSR with ALQR in the simulation. ALQR is a multipath DSR extension. Our findings are based on a simulation of 50 mobile wireless nodes forming an ad hoc network for 100 seconds spanning a 1500 by 300 meter space. The random waypoint model is used to move nodes in a free space model.

The traffic pattern is made up of 20 constant bit rate (CBR) sources broadcasting 512-byte packets at a constant rate of four packets per second. The random waypoint model was used to move the nodes. Each simulation's movement scenario files provide a pause time. Each node begins the simulation by choosing a random location inside the simulation area and going there at a uniformly distributed speed of 0 to 20 meters per second.
The item then comes to a complete stop for the duration of the pause. This situation is repeated throughout the simulation. We simulate movement patterns generated over five distinct pause durations. Adjusting the load levels to 50, 100, 150, 200, and 250 kB is also feasible. Each scenario is run five to ten times, and the mean values of the results are calculated. Control bit rate sources are utilized in the simulations. The packet rate is 4 per second when 10, 20, 30, 40, and 50 sources are considered, and 3 per second when 40 sources are evaluated.

3.1 Simulation parameters and Performance analysis

Packet Delivery Ratio To figure out the packet delivery ratio, divide the number of packets received by the number of packets sent.
Control Overheads: The total number of received packets divided by the total number of control packets defines control overhead.
End-to-End Delay: The average amount of time between the transmission of a packet by a source node and its successful delivery to a destination node It includes queue time, packet transmission and propagation, as well as MAC layer retransmissions. The waiting time may be caused by network congestion or a lack of valid routes.
Average Energy consumption: The total energy utilized divided by the number of packets delivered

3.2 Simulation Results

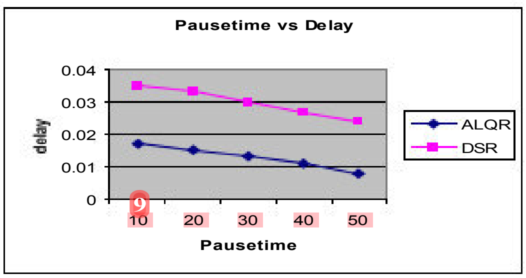

Fig. 2 Pause time Versus Delay

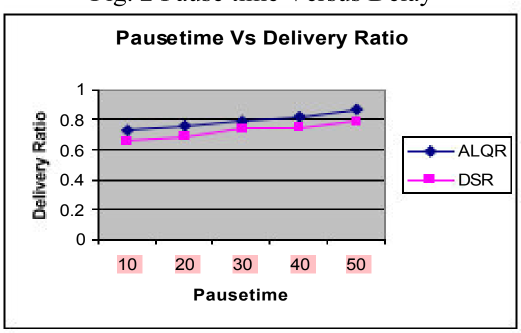

Fig. 3 Pause time Versus Delivery Ratio

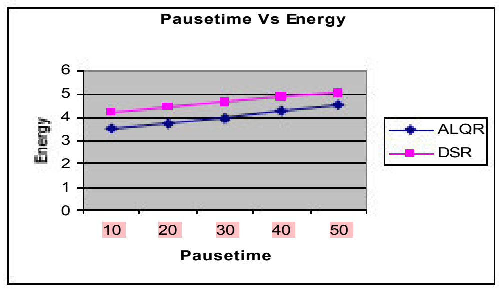

Fig. 4 Pause time Versus Energy

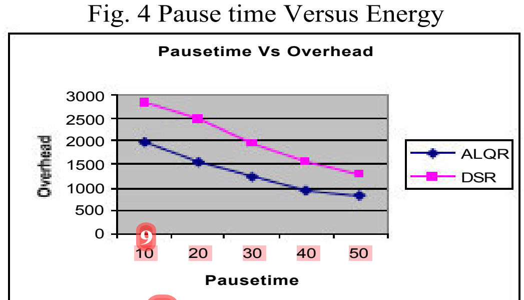

Fig. 5 Pause time Versus Overhead

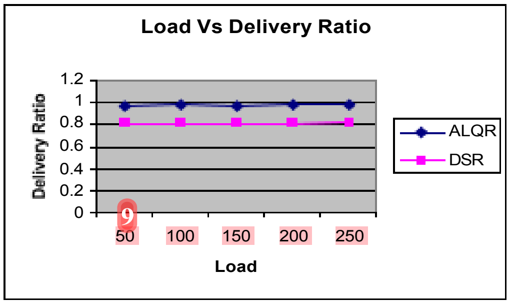

Fig. 6 Load versus Delivery Ratio

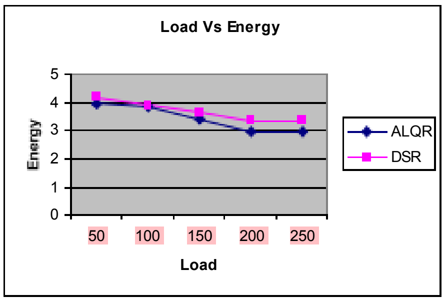

Fig. 7 Load versus Energy

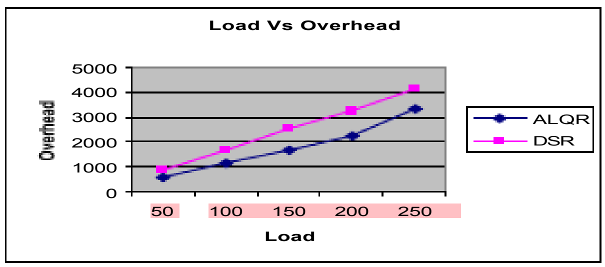

Fig.8 Load versus Overhead

In Fig. 2, it is clear that the delay is shorter in ALQR than in DSR because retransmission is less in ALQR, and it selects nodes with a high packet success rate by calculating the minimum value and cumulative cost. DSR, on the other hand, does not pick nodes with a high packet success rate. When there are fifty nodes, the ratio of packets delivered by ALQR is larger than that of DSR. This is due to the fact that the number of routes decreases when the node density is low. Therefore, the selection of the route is made purely on the basis of strong links, which results in the most expensive route. As a result, ALQR chooses routes that are free of congestion and have a high throughput, distributing the load in a manner that is proportional to the cost of each route. ALQR is able to deliver a high percentage of packets despite having a low node density. Because there is less need for retransmission in ALQR and because we are measuring neighbor stability by counting the number of Hello packets received, the energy consumption of ALQR is shown in Figure 4 to be significantly lower than that of DSR. We don't do anything more than send the RREQ if the stability is greater than the stability threshold value, which lowers the possibility that there will be a connection failure. The number of control packets that are introduced into the network by each routing technique is depicted in Fig. 5, for a total of twenty CBR sources. Due to the fact that it chooses node-disjoint paths at destinations with low node density, ALQR has a lower amount of overhead than DSR. However, in DSR, we do not pick any node-disjoint paths at the destination, nor do we calculate stability. This is in contrast to ALQR, which does these things.

ALQR selects high-throughput channels, which is the reason why its packet delivery ratio in relation to load is greater than that of DSR in Fig. 6. However, ALQR still uses less energy than DSR does since the retransmission rate in ALQR is lower. This can be seen in Fig. 7, where it is clear that as load increases, energy consumption decreases. However, ALQR has less overhead control than DSR does as a result of the selection of node-disjoint paths at the destination. This can be seen in Fig. 8, where it is clear that the control overhead will increase as the load increases.

4. CONCLUSION

We have devised and successfully demonstrated an adaptive link-quality routing technique for use in mobile ad hoc networks. In this study, the exploitation of multi-path is presented as a technique for boosting the quality of service provided by the DSR in its conventional form. When the process is finished, it will provide a set of paths that have a high degree of node disjointness and will compute the quality of service metrics for each path. This protocol will perform dynamic monitoring of the quality of service provided by the pathways, and it will distribute traffic according to the quality of service measurements provided by the pathways. This will result in an improvement in the overall performance of the network, including a reduction in the number of pathways that drop as well as an improvement in the continuity of service. This will be the case since the network performance will improve as a direct result of this. The performance of the network that is generated by the proposed protocol will increase, which will result in a lower number of missing packets and an increase in throughput. This improvement comes in contrast to the traditional DSR. Node-disjoint multi-path routing is known to have less overhead, but as the number of nodes (or the node density) increases, the likelihood of obtaining node-disjoint paths decreases.

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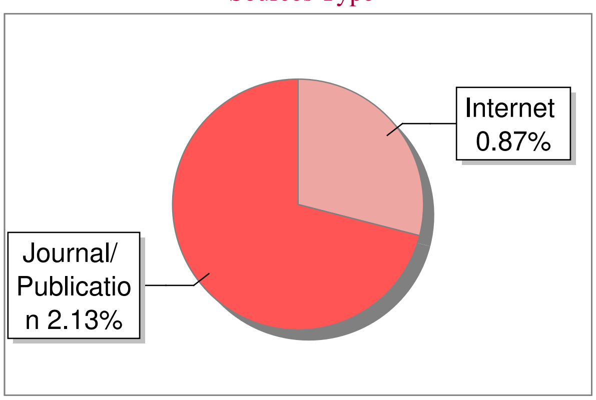

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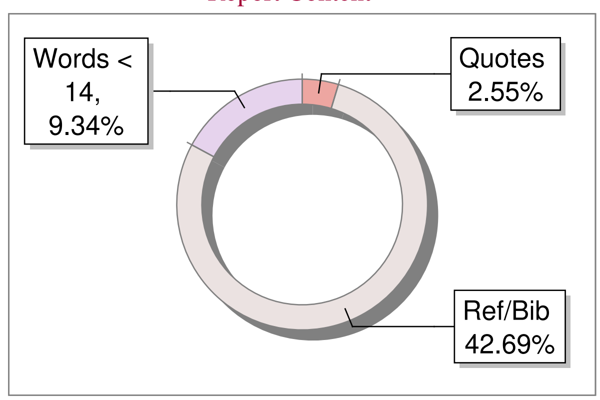

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"IoT and ML-Based Systems for Emotion Detection: A Comprehensive Review"

ABSTRACT

The Internet of Things (IoT) and machine learning (ML) integration have showed promise in improving emotion recognition skills. This study presents a review of recent research on emotion detection using IoT devices and ML algorithms. Numerous experiments have been carried out utilising various sensors to gather information for emotion identification, including electroencephalograms (EEG), heart rate monitors, and facial expression recognition. Various ML algorithms, including Support Vector Machine (SVM), k-Nearest Neighbour (k-NN), Artificial Neural Network (ANN), and Decision Tree (DT), have been used to classify emotions. The outcomes demonstrate that SVM and RF are the most accurate algorithms for heart rate data-based emotion recognition, whereas k-NN and DT are less accurate but easier to build and comprehend. However, the integration of sensors and devices raises important ethical considerations, such as data privacy and potential misuse. Future development should address these concerns and further advance the capabilities of emotion detection using IoT and ML.

Keywords: Emotion detection, Internet of Things (IoT), machine learning (ML), sensors, algorithms, heart rate, electroencephalogram (EEG), facial expression recognition, Support Vector Machines (SVM), k-Nearest Neighbor (k-NN), Artificial Neural Network (ANN), Decision Tree (DT), accuracy, data privacy, ethical considerations.

I. INTRODUCTION

Emotion detection has emerged as a significant research area in recent years, driven by its potential applications across a variety of sectors, including healthcare, marketing, and entertainment. The ability to accurately recognize and classify human emotions has profound implications for personalized healthcare, customer feedback analysis, and content recommendation systems.

The convergence of Internet of Things (IoT) and Machine Learning (ML) techniques has presented exciting opportunities in the field of emotion detection systems, enabling the development of more sophisticated and advanced solutions.IoT devices equipped with sensors can capture physiological signals, facial expressions, and voice intonations, providing rich data for emotion analysis. ML algorithms can then be employed to process and analyse this data, enabling the classification of emotions with high accuracy.

The goal of the study is to provide a comprehensive overview of emotion detection systems that leverage the synergy between IoT and ML. The study will examine the methodologies, algorithms, and techniques used in these systems, as well as their potential applications and impact in various industries. Additionally, it will discuss the challenges and future directions in this field.

By understanding the advancements and capabilities of IoT and ML-based emotion detection systems, researchers, practitioners, and industry professionals can gain insights into the potential advantages and challenges associated with their implementation. This knowledge will serve to the development of more effective and reliable emotion recognition solutions, paving the way for exciting opportunities in fields where understanding human emotions is paramount.

II. METHODS AND MATERIAL

The methods and materials used in IoT and ML-based emotion recognition systems typically involve the integration of various sensors and devices to capture data on physiological responses such as heart rate, skin conductance, and facial expressions. These signals are then pre-processed and analysed using feature extraction techniques to derive necessary features that are input into machine learning models.

The particular application and the characteristics of the dataset will determine which machine learning algorithm is employed. Support vector machines, artificial neural networks, decision trees, random forests, and k-nearest neighbour classifiers are examples of frequently used methods.

The datasets used in emotion recognition systems vary widely in terms of size and diversity. Some systems may use small datasets collected in a controlled laboratory setting, while others may utilize large-scale datasets collected in real-world environments. Metrics including precision, recall, F1 score, and total accuracy are frequently used to assess the systems' performance. The specific dataset and attributes used for classification can affect the performance of various methods.

Overall, the methods and materials used in IoT and ML-based emotion recognition systems are constantly evolving as new sensors, algorithms, and datasets become available. The goal is to continually improve the accuracy and reliability of these systems for real-world applications.

III.RESULTS AND DISCUSSION

The results from IoT and ML-based emotion identification systems show how well they are able to recognise and categorise human emotions with accuracy. IoT device integration with machine learning algorithms has demonstrated promising results across numerous datasets and applications.

Using various ML algorithms, great accuracy rates have been attained in numerous experiments. For instance, Support Vector Machines (SVM) have proven to be extremely accurate in classifying emotions based on physiological signals and facial expressions, with accuracy rates above 90%. Artificial Neural Networks (ANN) have also shown comparable performance, achieving accuracy rates above 85%.The accuracy of emotion detection systems is substantially influenced by the features that are selected from the acquired data. Emotional states can be accurately captured by features including heart rate variability, skin conductance responses, and facial action units incorporating multiple modalities, such as combining physiological signals with facial expressions, which has shown improved classification results.

The diversity of emotional states, dataset size, and the generalizability of the ML algorithms are just a few examples of the variables that may affect how well the emotion detection systems function. These elements must be taken into consideration while assessing the systems' viability and resilience in practical applications.

Ethical considerations, such as data privacy and potential misuse of emotion recognition technologies, need to be addressed. Strict privacy measures should be implemented to ensure the confidentiality and protection of individuals' personal information. There are important consequences for how IoT and ML are combined in emotion recognitionfor various industries. In healthcare, these systems can assist in personalized patient monitoring and mental health assessment. In marketing, they can be offering insightful information into consumer behaviour and sentiment analysis. In entertainment, they can enhance user experiences through adaptive content delivery.

Overall, the results and discussions highlight the potential of IoT and ML-based emotion recognition systems and their wide-ranging applications. Additional study is required to refine and optimize these systems, addressing challenges and exploring new possibilities for accurate and ethical emotion detection.

TABLE I

Algorithm	Accuracy (%)	Dataset Size	Emotions classified	Features used	Reference
SVM	88.5	80	2(Positive/Negative)	Heart rate variability and skin conductance level.	Chen, Y., Lai, J. H., Zhang, Y., & Chen, M. (2019). Emotion recognition using SVM based on HRV and SCL features. In 2019 13th International Conference on Sensing Technology (ICST) (pp. 1-5). IEEE.
CNN	86.2	240	4(Happy, Sad, Anger, Neutral)	2D and 3D convolution neural network.	Cui, R., Guo, D., Liu, Y., Yu, Y., & Tian, Y. (2020). Emotion recognition based on 2D and 3D convolutional neural network using IoT. IEEE Access, 8, 79216-79224.

RF	84.6	20	2(Positive/Negative)	Skin conductance level and valence	Gao, Z., Zhang, Y., Xu, Y., Gao, F., & Gu, T. (2018). Emotion recognition using random forest classifier based on skin conductance level and valence. In 2018 IEEE International Conference on Consumer Electronics (ICCE) (pp. 1-2). IEEE.
k-NN	70.5	34	2(Happy/Sad)	Heart rate	Chai, Y., Zhao, L., & Zheng, W. L. (2018). Emotion recognition based on heart rate using k-nearest neighbour algorithm. In 2018 4th IEEE International Conference on Computer and Communications (ICCC) (pp. 1412-1416). IEEE.
DT	80	50	2(Positive/Negative)	Heart rate and skin conductance level.	Kaur, R., & Khanna, P. (2017). Heart rate and skin conductance-based emotion recognition using decision tree. In 2017 4th International Conference on Signal Processing, Computing and Control (ISPCC) (pp. 45-49). IEEE.

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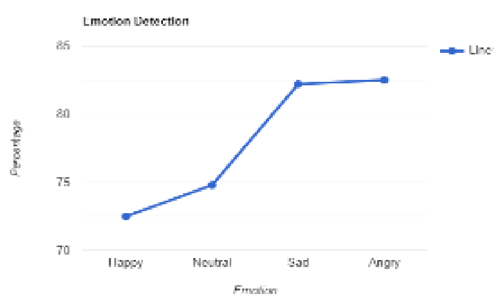

Figure 1. The following chart illustrates the variations of detected emotions by an emotion recognition system that incorporates IoT devices and ML algorithms.

IV. CONCLUSION

Emotion detection using IoT and ML has the potential to revolutionize the way one interact with technology and each other. By using sensors and machine learning algorithms to analyse human behaviour, one can gain insights into our emotional states and use this information to improve our well-being, productivity, and overall quality of life.

IoT devices such as smartwatches, fitness trackers, and home assistants can collect data on various physiological and behavioural indicators of emotion, such as heart rate, skin conductance, and facial expressions. Machine learning algorithms can then analyse this data to identify patterns and correlations that can be used to infer the user's emotional state.

There are many potential applications for emotion detection using IoT and ML, including mental health monitoring, stress management, personalized marketing, and even crime prevention. However, there are also concerns about privacy and data security that need to be addressed to guarantee that the benefits of this technology are realized without sacrificing personal autonomy.

Overall, emotion detection using IoT and ML is a promising field that has the ability to transform many aspects of our lives. With continued research and development, one can expect to see more advanced and sophisticated applications of this technology in the years to come.

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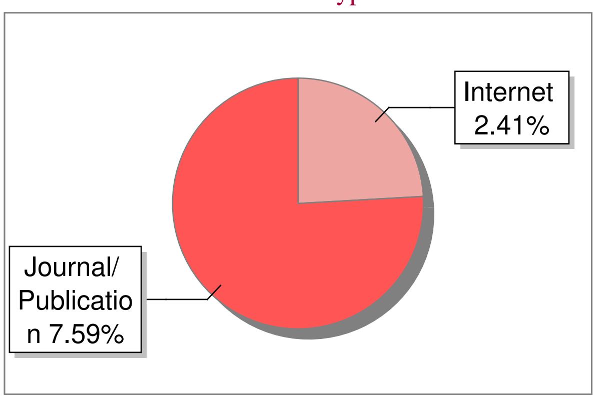

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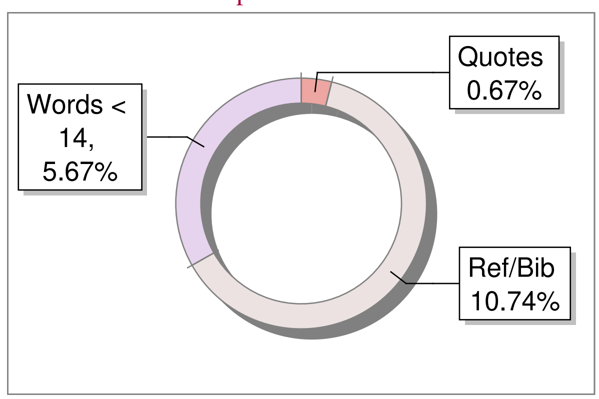

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Visualizer for Algorithms and Path Finding with User Interface Design

ABSTRACT

A graphical description of how algorithms like sorting and path finding work is provided by the Algorithm and Path Finding visualizer. The system thoroughly explains each process using both text and animation. Dots, lines, dimensional bars, and other graphic elements are combined to create an algorithm visualisation, which shows some of the algorithm's more "interesting events." The benefits of the algorithm visualizer include a user-friendly UI. It's easy to use the UI. Users move easily and without exertion. input of data entry by users is possible in the system. User command Users can adjust the speed of the algorithm animation to make it simpler or harder for them to grasp the backend functionality depending on how quickly they learn and process new information, and it will show the space and time complexity of each algorithm.

I. INTRODUCTION

Students need to acquire a solid grasp of complex topics like algorithms since they form the foundation for their computational thinking and programming skills. We had seen that using traditional teaching techniques made it more challenging for teachers and students to articulate their ideas. Since, as the saying goes, "a picture is worth a thousand words," many academics and educators believe that implementing algorithm visualization techniques can help students learn an algorithm more quickly and thoroughly. Therefore, we created a teaching technique that helps students as well as teachers learn about various searching and sorting algorithms through visualization and hands-on experience. A well-done visualization brings algorithms to life by graphically displaying their multiple states and animating the transitions between them. More specifically, dynamic algorithm visualization plays an algorithm's actions like a continuous movie. The human visual system provides a better way of understanding these important conceptual processes through visualisation. Researchers have come up with several techniques to get around these obstacles, including graphical representations, traditional animations, explanatory films, etc. These techniques help the student better understand the concepts. Algorithmic visualization is a technique that has advanced in the past and is gaining popularity in computer science. With simple animations and transition effects, the Algorithm Viewer is a useful tool. a tool that allows students to see how the algorithm works at each step.

II. METHODOLOGY

This paper includes different algorithms: sorting, searching, pathfinding, trees, travelling salesman, minimum spanning tree, binary heap, and graph traversal. The following section includes the methodology used to visualize different types of algorithms.

Essential functions of the algorithm visualizer are as follows:

- The system shall take inputs in array format.

- The system will take user inputs otherwise it will take default inputs.
- When a user enters new data, the dataset should be updated with the new data.
- It will sort array using different algorithms which is selected by users.
- It shows the step-by-step process of a algorithms with bar graphical animation.
- Through this paper every student can learn at their own pace with our three speeds of learning: slow, medium, and fast.

Architectural design

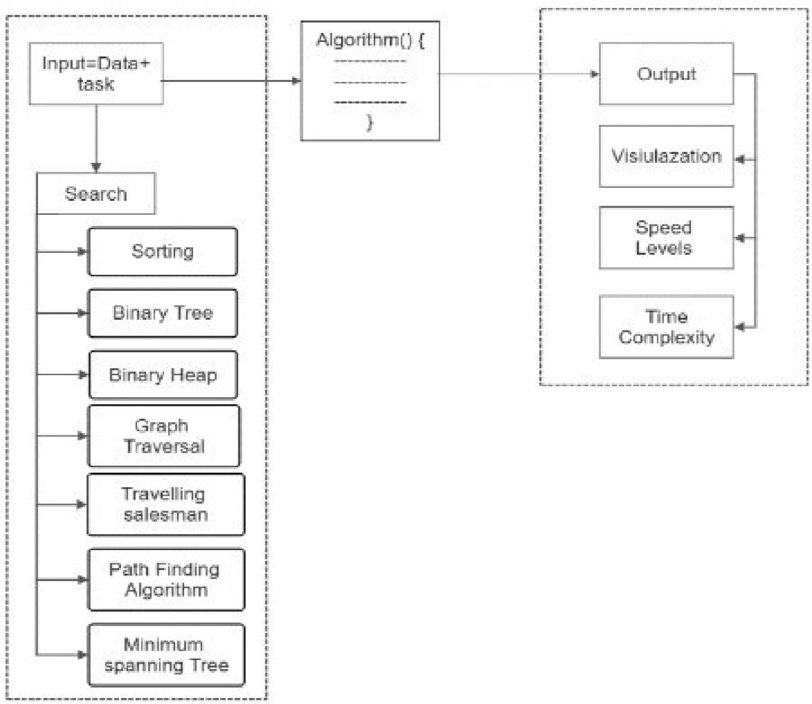


Figure:1.1 Architectural design

Algorithm and Path Finding Visualizer's architectural design is divided into several stages. Algo Magic has a Welcome Page that includes sorting algorithms, a binary heap, a tree, a graph traversal algorithm, a minimum spanning tree, path finding algorithms, and a travelling salesman. The subheads in that are contained in each of the algorithms. The algorithms are seen when a user clicks the subheading. A new array is first generated by the user, or else the default array size and items are used. The array size and sorting speed are user-adjustable for convenience. The user may quickly comprehend each of the algorithms by selecting either the Visualize or the Tutorial View.

Sorting Algorithm:

Sorting section includes different sorting The sorting section includes different sorting algorithms like bubble sort, insertion sort, merge sort, quick sort, radix sort, selection sort and counting sort. When the user gives an input, the input will be taken as an array and displayed using a graphical representation with bar graphs. Each bar's height is equal to the numerical value it represents.

Different colours are used for bars between the currently sorted and unsorted arrays. Both the array size and sorting speed can be adjusted as per user demand, which also affects speed. The user also has the option of choosing any algorithm from the list. After sorting, the bars colours will change to a single colour, and the elements of the array will be rearranged in ascending order.

Path-finding Algorithm (SSSP):

Different algorithms are used, including Dijkstra's algorithm and the A* algorithm. The user's algorithms were chosen based on their complexity and level of popularity. After the visualization is complete, the viewer will be able to differentiate between thefunctionality of several algorithms based on time complexity.

Mazes and patterns are used to provide a better and clearer understanding of algorithms. Users can relate the visualization to situations in the real world since there will be walls or other impediments between the starting node and destination node. The user will also be able to select the best method based on algorithmic time complexity. It features a speed option that enables the user to customise the speed of the visualization based on personal preferences. Because everyone learns at a different rate, this functionality was added.

Binary Heap:

A full binary tree that upholds the Max Heap property is known as a "binary (max) heap". One potential data structure for simulating an effective priority queue (PQ) using an abstract data type is the binary heap. This visualization displays a binary maximum heap of integers with allowable duplications to narrow the discussion's focus. For a simple conversion to binary min heap, see this. The binary (max) heap is implemented internally as a compact array, but the user can choose between this and a more visually intuitive whole binary tree representation. In this diagram, you can carry out a variety of binary (max) heap operations, such as

- Create (A) – O (N log N) version,
- Create (A) – O (N) version
- Insert (v) in O (log N),
- Versions of Extract Max (),
- Update Key, and so on.

Graph Traversal (Searching):

A linear search starts at one end of a list and moves sequentially across it, checking each item until it is located and going to the next if necessary.

The search interval in a binary search is repeatedly cut in half. Utilizing the knowledge of a sorted array, binary search attempts to decrease the time complexity to O (log n). There are two methods of graph traversal: the depth-first search algorithm (DFS) and breadth-first search.

DFS only accepts one input variable: the origin vertex is s. The breadth first search (BFS). This visualization has many DFS and BFS versions, all of which are executed, including a binary tree that meets the next BST, the bipartite graph checker algorithm, and the topological sort algorithm (both DFS and BFS versions are employed).

Trees (BST, AVL):

A binary tree that satisfies the following BST properties is known as a "binary search tree" (BST): Because it was assumed that all the numbers in this visualization are distinct integers, a minor adjustment is required to account for duplicates and non-integer values. Every vertex must have vertices in its left subtree containing values that area lower than its own and every vertex must have vertices in its right subtree having values that are greater than its own.

A balanced BST, such as the AVL tree, is an efficient data structure for creating a certain form of table-based Abstract Data Type (ADT).

Minimum Spanning Tree:

The spanning tree is an undirected, weighted, connected graph like a tree. Every vertex in subgraph G is connected to every other vertex. The overall weight of each spanning tree in graph G can vary.Kruskal's approach is a greedy minimum spanning tree algorithm that first creates a forest of MSTs and then [2] combines them into a single MST with the shortest overall weight. For Kruskal's to work, the input graph's edges, which are often kept in an edge list data structure, must be sorted by non-decreasing weight. Union-find disjoint sets (UFDS) is a data structure useful for detecting and preventing cycles.

Prime's strategy: Another O (E log V) greedy MST method is Prim's, which involves gradually expanding a minimum-spanning tree outwards from a single source vertex until it covers the entire graph. Prims uses a direct-addressing table (a Boolean array), a priority queue data structure, and an effective vertex neighbour enumeration technique to dynamically organise the edges under consideration based on non-diminishing weight.

Travelling Salesman:

The Travelling Salesperson Problem (TSP) seeks to identify a tour with the lowest possible cost that stops in each city just once. This suggests that the distance function satisfies the triangle inequality, and for the sake of this visualization, the underlying graph is a complete graph with (near-) metric distance. It is possible to provide input using two sources.

Draw Graph: To maintain the near-metric property of the graph, you can provide a number of points on the drawing box, but you must avoid drawing any edges. When you are done placing the points, the edges will be automatically drawn for you. Example Graphs: To get you started, pick one from the list of examples.

Brute force: Since it doesn't matter where it starts, it only tests the (V-1) permutation of vertices using brute force and enumerates all possibilities. O(V!) = O(V*(V-1)!) is the time complexity.

Dynamic programming: This method utilises the well-known Held-Karp algorithm. Like the brute-force method, this visualization uses RAM to cache the DFS search results. As a result, the run-time complexity is reduced to O (2 V * V2). The time complexity is O (2V * V2).

III. RESULT AND DISCUSSION

Sorting algorithm analysis: The comparison of the various sorting algorithms is used in this web-based visualization tool, as shown in Table 1. Which algorithms have different input values and an average runtime in seconds are examined. It is evident from the table below that Selection Sort takes less time than other sorting algorithms. Bubble Sort will take the longest of all the algorithms because it compares and swaps each neighbouring element according to the specifications. For each traversal, the entire process will be repeated. As aresultBubble Sort has a higher temporal complexity than the others.

Table 1: Sorting algorithm comparison

Quantity of inputs	Duration of Bubble Sort in secs	Duration of Selection Sort in secs	Duration of Insertion Sort in secs	Duration of Merge Sort in secs	Duration of Quick Sort in secs
06	5.2	3.6	4.7	4.2	2.4
07	6.0	4.5	4.4	4.4	2.1
08	7.5	6.3	5.0	5.1	3.2
09	8.2	7.4	5.3	5.2	3.5

Pathfinding Algorithm Analysis: A successful algorithm will determine the shortest path with the fewest possible node visits. Dijkstra's algorithm is the least effective pathfinding algorithm since it has no way to reduce search space and visits considerablymore nodes during each route computation phase. The A* algorithm is one of the most effective pathfinding algorithms, depending on the circumstances. Here, users are welcome to contribute and can choose an algorithm from a list while the algorithm is visually explained. A time complexity parameter is also provided, which will be displayed once the respective pathfinding algorithm has completed its task and can be used for comparison purposes.

The User interface of Algorithm and Pathfinding Visualizer:

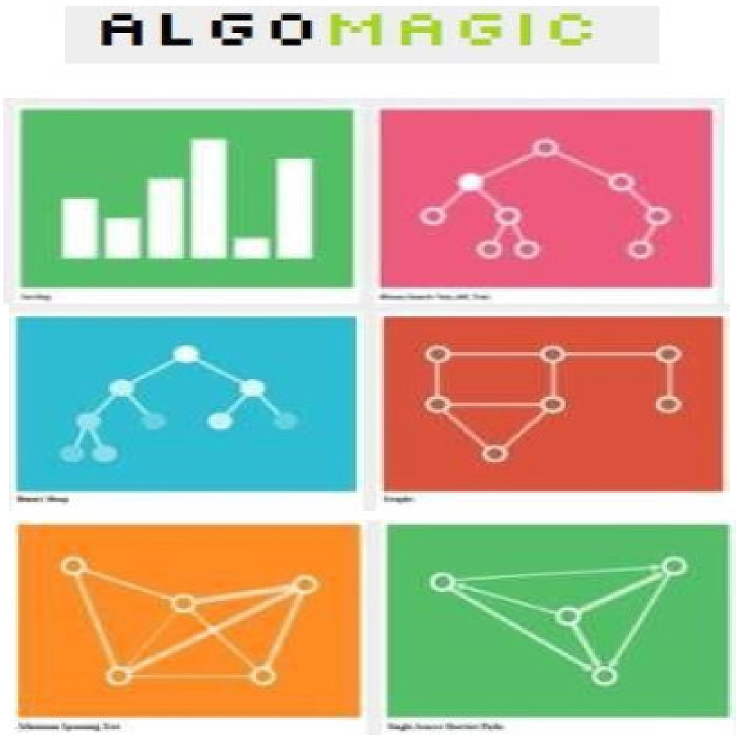


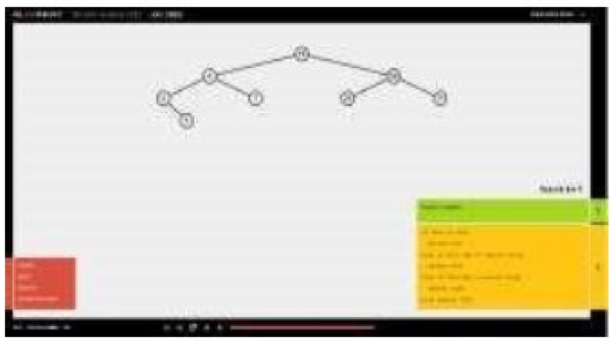
Figure:1.2 User Interface

First, the Welcome Page will appear, which includes sorting algorithms, binary heaps, trees, graph traversal algorithms, minimum scanning trees, and path finding algorithms. Each of the algorithms containssubheadings. The algorithms are visualized when a user selects the subheading. The user can provide new input values for visualization or else use the default input values. The array size and sorting speed are user-adjustable for ease. The users can adjust the speed of the algorithms as per their convenience. The user can understand each of the algorithms by selecting either the Visualize or the Tutorial View.when the user clicks on one of the algorithms. The inputs are controlled and managed by users, or by default, it will take inputs in array format. Users can adjust the speed levels, such as slow, medium, and fast.. User can make use of tutorial mode option when they are not aware of a particular algorithm. The pseudocode is visible while visualizing the algorithm.

Sorting

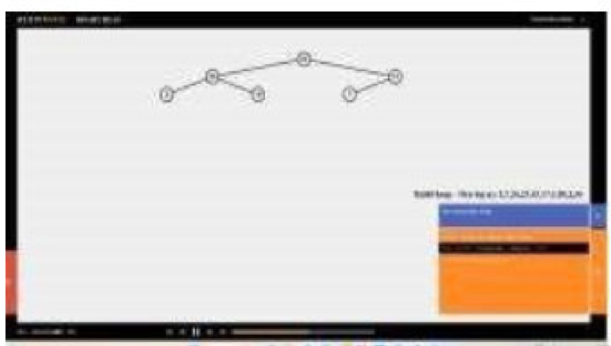
A sorting algorithm will help rearrange a given array of elements according to a comparison operator on the elements

Binary Search Tree



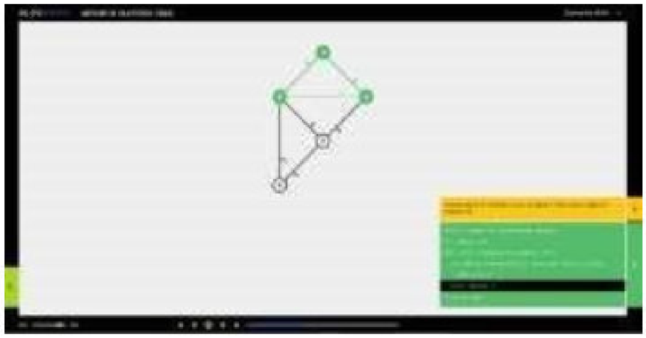
The node-based binary tree data structure known as the "Binary Search Tree" includes the following characteristics: A node's left subtree only hasnodes with keys lower than the node itself. A node's right subtree only has nodes with keys higher than the node itself. A binary search tree must also be present in both the left and right subtrees. The AVL tree is a self-balancing binary search tree in which there can never be more than one difference between the heights of the left and right subtrees for any given node.

Binary Heap



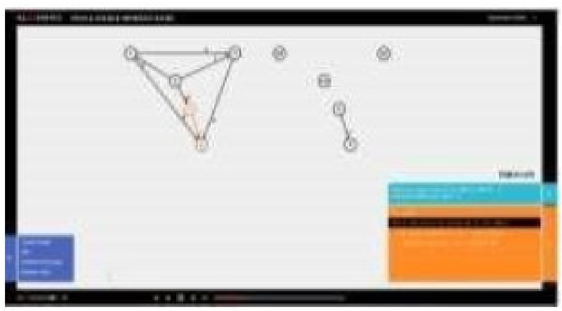
Either the Min Heap or the Max Heap is a binary heap. The root key of a min binary heap must rank lowest among all other keys in the heap. All nodes in a binary tree must have the same property, recursively true. Min Heap and Max Binary Heap are comparable.

Minimum Spanning Tree



A minimum spanning tree (MST), or spanning tree with a weight less than or equal to the weight of every other feasible spanning tree, is the minimal weight spanning tree for a weighted, linked, undirected graph. A spanning tree's weight is the total of the weights assigned to each of its edges. In a nutshell, MST is the spanning tree with the lowest weight among all the spanning trees in a given graph.

Single source shortest path



The single-source shortest path (SSSP) problem consists of finding the shortest paths between a given vertex v and all other vertices in the graph. Algorithms such as Breadth-First-Search (BFS) for unweighted graphs or Dijkstra [1] solve this problem.

IV. CONCLUSION

Several searching and sorting methods are visualized using graphical and animation techniques. It is a useful tool for students and researchers to quickly comprehend the implicit algorithmic sequences. Here, users are welcome to choose an algorithm from a list while the algorithm is visually explained. It has been discovered the learning through animations rather than merely text or oral explanations makes it easier for humans to remember concepts. The method is designed to be easily accessible. Students can easily understand the time and space complexity as well.

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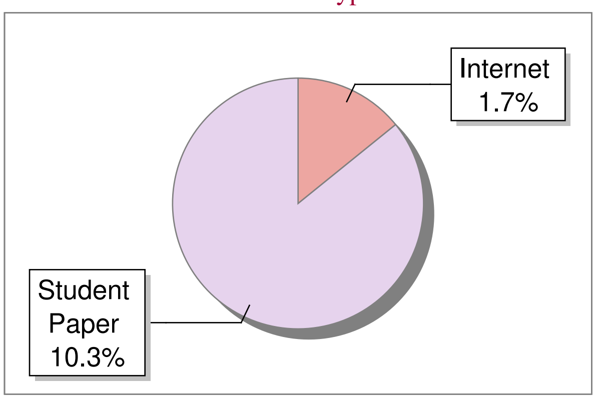

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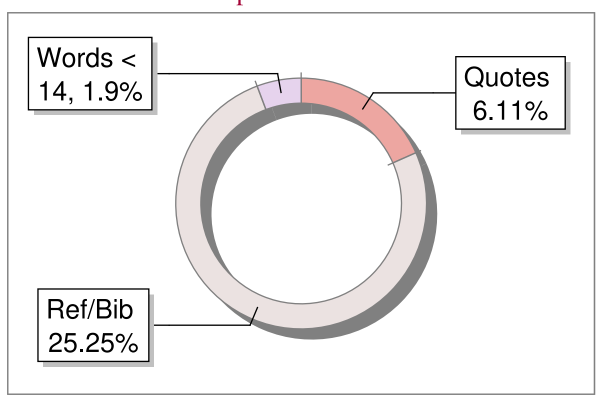

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Smart HelmetFor Motorcycles

ABSTRACT

India, the world's second-most populous nation, has a sizable young population. Today's youth like riding bikes, and due to fashion, they often choose not to wear helmets. Due to them, the number of fatal bike accidents is rising daily. Even triple riding causes a lot of fatalities. Head injuries are a major cause of fatalities and can be avoided by using a helmet. A helmet is a type of head protection equipment that prevents head injuries. The helmet helps the skull protect the brain. In order to create the smart helmet, various sensors are used. The study also illuminates how the smart helmet system has evolved over time and uses cutting-edge technology like the Internet of Things to function today. Also, this paper discusses the intelligent helmet technology that warns the rider of approaching large vehicles or buses in order to prevent crashes.

Keywords: *Internet of Things, IR sensor, smart helmet, accident detection, and alcohol detection*

I. INTRODUCTION

Family and friends are the two things in our lives that matter most. With them, you can feel safe and comfortable. These days, two-wheeled vehicle traffic accidents are frequently to blame for the tragic loss of life or significant injury sustained by victims. In addition, India reports one death every several minutes, highlighting a significant issue that requires everyone's attention. Accident victims may not receive life-saving treatment in time to save their lives because of the difficulty of providing immediate first aid. The WHO estimates that helmets can reduce fatalities by 40 percent and injuries by 70 percent.

Sensors play a crucial role in all smart applications. It recognises any physical or chemical change, and after analysing the data gathered, sensors automate the software or equipment to make it intelligent. IoT incorporates a variety of sensors, devices, and nodes that can interact with one another without human involvement. Alcohol sensors are used to determine whether a cyclist has consumed alcohol. A rider's helmet can be examined using an infrared sensor. It determines whether the user is donning a helmet or not. The motorcycle will not start if the rider is drunk and not wearing a helmet. The bike will start only if a helmet is worn and there are no signs of alcohol usage.

II. METHODOLOGY

We have developed a smart helmet using IOT, an advanced technology that ensures two-wheeler rider safety. It consists of two modules, namely,

HELMET SECTION:

The receiver is put on a specific bike, and the transmitter is put in the helmet portion. As a result, two modules are able to communicate without a wire connection. When a bike rider puts on the helmet, a switch within it activates. Because of its clever positioning, the alcohol sensor in the helmet can quickly detect the rider's breath. As the rider exhales, the sensor detects the alcoholic gas. The threshold value will change, and the bike won't start since the ignition is off, if the alcohol sensor detects that the rider is really inebriated. A microcontroller that is built within the helmet will take its input from the output of these components. Then, via an RF transmitter, the helmet's microcontroller's processed data is transmitted to the bike module. Figure 1: Helmet Section BIKE SECTION: The bike module's RF receiver gathers data from the helmet and transfers it to the microcontroller. The microcontroller will then analyse all of the helmet's data before deciding whether or not to start the bike. Two requirements must be met in order to start a bike's ignition: 1. Since the helmet has a switch that, when pressed, initiates ignition, the rider is required to wear the helmet. 2. The cyclist shouldn't have ingested alcohol. The output of the helmet data must meet the aforementioned two requirements for the bike to start; otherwise, the bike won't start.

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Figure 2:BikeSection VirtualDesign of the System: Figure 3: Virtual design We have used Proteus 8 professional software to design and run the simulation. The design is as shown in Figure 3. The Arduino IDE is used to implement the server and client programmes. III. RESULT AND DISCUSSION When the user switches on the bike, the phrase "Smart Bike Helmet" appears on the LED display of the bike module. When the rider puts on the helmet and connects the clip for power to the helmet module, the switch detects the presence of a human head inside the helmet, and the client (the helmet module) requests assistance from the server (the bike module). The LED display reads "IGNITION ON," and the buzzer sounds. The server then activates the relay, an electromagnet switch that permits electricity to flow to the ignition coil, which is

required to start the car. The implementation results are presented in Figs. 4, 5, 6, and 7, respectively. If alcohol is found, "ALCOHOL DETECTED" is shown on the LED display. Figure:4 Figure:5 Figure:6 Figure:7

IV. CONCLUSION

With the development of science and technology, each person's existence has become increasingly significant. In order to offer security and fit all necessary facilities in a small space, smart helmets are employed. The suggested smart helmet design would provide all types of helmets with modern, cost-effective technologies to help avoid traffic accidents. The smart helmet is an intelligent device that will make biking safer. For the protection of motorcycle riders, smart helmets are the only option given the state of the roads, the high accident rate, the prevalence of traffic offences, and the weak regulatory framework. It is essential to wear a helmet when operating a motorcycle because, in the event of an accident, it can prevent the rider from suffering serious brain injuries. Thus, this is where the precise IR sensor will be used. It will ensure that a rider wears a helmet before starting the bike. Today, it's crucial to take the issue of drunk driving into account because bike accidents are more likely to be caused by drunk driving than automobile accidents.

V. FUTURE SCOPE

The future may include accident identification,integrated Bluetooth, GPS, communication, head-up display, and noise-cancelling technology, but also air pollution alerts!.Some of those features are an LED light on the front, which can flash presumably to make the rider more visible at night; rear distance sensors to indicate tailgaters that flash red light alerts inside the chin bar; a remote control; a G sensor that detects a crash and alerts friends with GPS coordinates of the incident; an adjustable speed alert; and when you take off your helmet, it records where the bike is parked on a GPS map. It also has a smoke detector to alert you to high levels of air pollution.

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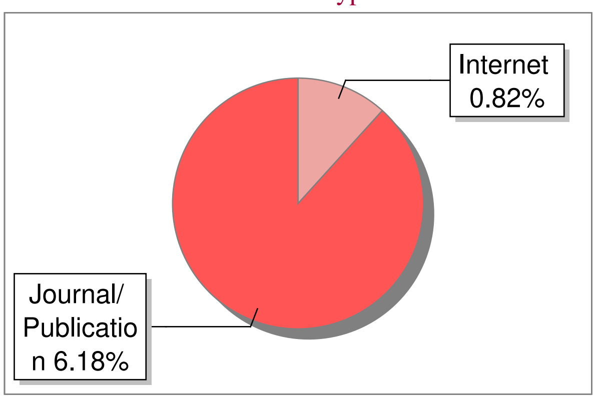

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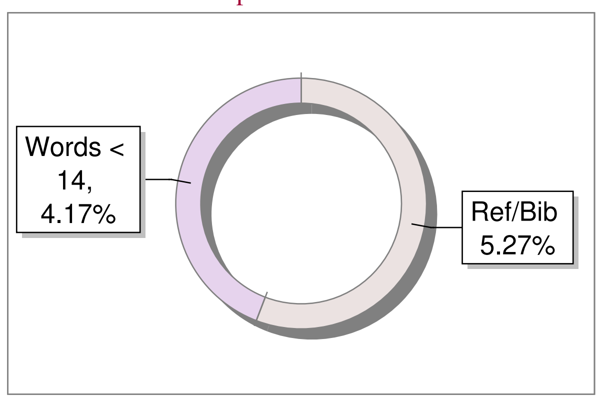

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SUBJECTIVE WELL- BEING AMONG SINGLE MOTHERS

Abstract:

Woman who raises a child or children on her own, without the support of apartner or spouse is regarded as Single Mother. This role often comes with unique challenges. As single mothers mustnavigate the responsibilities of parenthood, financial stability, and emotional well-beingwithout the presence of a co-parent, they undergo a lot of stress,challenges and might have toshoulder a lot of responsibilities. Having no partner or spouse in the household andassociated burden might put a single motherin difficult situations of not being able to managethe responsibilities and in turn affect their psychological well-being. Besides fulfillingtheprimary responsibility of the mother for the care and well-being of the child or children, singlemother will also have to face challenges associated with economic , psychological, emotional,physiological s factors and also in parenting. With these constraints, a single mother goesthroughalotofdistress inherdailylifethat affecthersubjectivewell-being.

A study was conducted on 30 motherswho are single to know their subjective well-being. Data wascollected using standardised scale - Subjective well-being inventory developed by Nagpal. Rand Sell. H (1985-1992). The result obtainedwere coded, tabulated and statistically tested withSPSS. The correlation between various factors of subjective well-being is also studied throughtheresearch.

Keywords:Singlemother, Subjectivewell-being,Co-parenting

Introduction:

Single mother is a person who raises a child or children without the help of her spouse.Being one can be same as co parenting, which is when both parents agree to havean equal share in the child rearing even though they are no longer together. Reasons forbecoming a single mother includes divorce, death of the spouse, abandonment by spouse,singleparentadoptionorincase ofartificialinsemination.Accordingtoestimates,between 25 to 33 per cent of all households in the world are de facto headed by women, who, economicallyresponsible for their own and their children's survival (Tinker et al., 1976-77). Being a single mother is a multifaceted role that requires strength, resilience, and unwavering determination(Angelou et al.,1969). Absence of a partner or spouse in the household might put singlemothersin complex challenges.

The role of single motherhood is challenging one especially when the family is headed by awoman and has no support. Single mothers face a number of challengesespecially while dealing with self and also in terms of nurturing their children in terms of upbringing, children,s future and their settling down in life. Single mothersnavigate the complexities of life, shouldering the responsibilities of both caregiver and provider(Romney, A. 2015). With hiked responsibilities, single mothers face burden of psychologicaland financial distress. The fear of not being able to reach up to the expectations of the societyleads them to face lot of stress and frustrations which in turn may have a negative impact ontheirwellnessand well-being.

Well-being is a state of being comfortable healthy and happy(Diener, 1999). The problemsfaced by single mothers are multi faceted and are correlated to one another as the severity ofone problem may adversely affect another life situation. This will in turn affect their subjectivewell-being and life satisfaction. These problems persist till the children become independednt,after that the problems are considerably reduced (Kotwal.N etal, 2009).

Subjective well-being (SWB) refers to an individual's self-reported evaluation of their overalllife satisfaction and happiness. It encompasses how individuals perceive and evaluate thequality of their lives, taking into account various dimensions such as emotional experiences,life satisfaction, and the presence of positive and negative affect. Despite of the numerous stressors and demands single mothers face, they report moderate tohigh level of life satisfaction. Even then, Society needs to emphasize the importance of SocialSupport, personal resilience and positive coping strategies in contributing to thewell-beingofsinglemothers(Nelson-Coffey etal.,2019).

ResearchMethodology:

Objectives:

1. TostudytheSubjectiveWell-beingof Single mothers
2. To assess the correlation of different factors affecting subjective well-being ofsingle mothers

Samplingframework:

The universe of the study are Single mothers. The researcher used snowball sampling techniqueunder Nonprobability samplingmethod.

ResearchDesign:

The present study adopted descriptive and analytical Research design.

Toolsandtechniquesof datacollection:

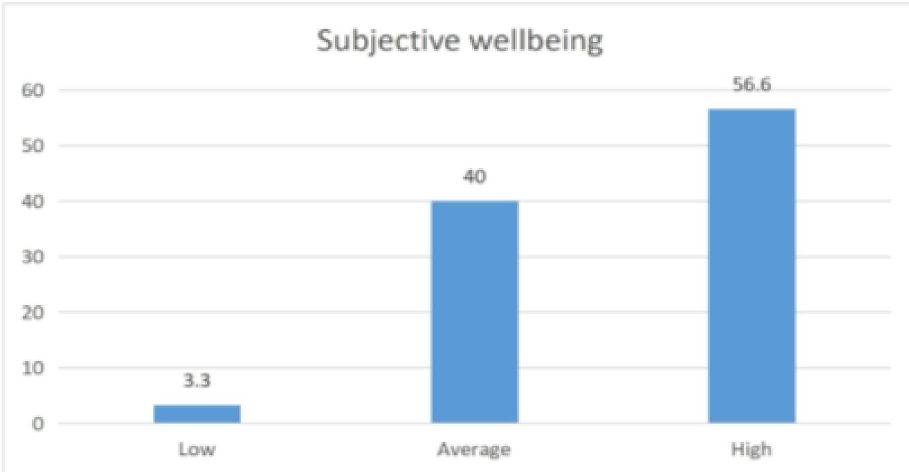
Subjective well-being inventory is developed by Nagpal.R and Sell.H (1985,1992) is used astool to collect the data.Thedata was collectedthrough onlinemethodusing google form.

Scopeofthestudy:

This research study was carried out exclusively to measure the Subjective well-beingof single motherspertaining to 11 different significant areasand assess the correlationbetween different factors of Subjective Well-being. This research would be useful to socialworkers, psychologists and social welfare administrators to understand the problems of singlemothers and there by sketch out the interventions to overcome the social, psychological andemotionaldistress facedby them.

ResultsandDiscussion:

GraphshowinglevelofSubjectivewell-beingamong SingleMothers



As per the data on the table, it can be said that 3.3 percentage of respondents admit they havelowSubjectiveWell-being,40percentageofrespondentsshowaveragelevelofsubjectivewell being and 56.6 percent of respondents exhibit high subjective well-being. Since Subjectivewell-being is about how a person sees and experiences her life on whole which is inclusive ofheraffect,lifesatisfactionandsenseofmeaningandpurposeinlife.Thedatacanbeinterpreted as the half of the respondents say they have high subjective well-being in spite ofshouldering responsibilities beyond normal mothers. The reason for this could be the sense offreedom they experience compared to their previous living and lifestyle which could have beentraumatic or stressful. The mothers might not have enjoyed their married life due to variousconstraints with possible emotional dissatisfaction , lack of support, addictions of spouse etc..,Thelevelsexhibitedbytherespondentsshowthelevelofhappinesstheyexperienceintheirlife which depicts that they are happy being single parents rather than be in marriage or co-parenting.

Table1:ShowingarewiselevelofSubjectiveWell-beingamongSinglemothers

Areas		**Mean**	**Level**
GeneralWell-beingPositiveAffect	6	5.40	low
ExpectationAchievementCongruence	6	5.77	low
ConfidenceInCoping	6	7.20	high

Transcendence	6	7.00	low
FamilyGroupSupport	6	6.20	average
SocialSupport	6	6.00	average
PrimaryGroupConcern	6	6.03	average
InadequateMentalMastery	14	12.90	low
PerceivedIllhealth	12	12.77	high
DeficiencyinSocialContacts	6	6.20	average
GeneralWell-beingNegativeAffect	6	6.57	high

According to the results, the sample has low general well-being positive affect with the meanscore of 5.40 which means the respondents do not perceive their life on overall as functioningsmoothly and joyfully(Nagpal and Sell,1985). It means that the single mothers do not have ahappylifeand thereforedo notreflect positivewell-being.

Respondents reveal that they have low expectation achievement Congruence with the meanscore of 5.77 which means they experience less satisfaction in their life which could mean theyhaven't been able to live as per their own expectation and achieve success. It shows that theyhaven'tachieved asmuch as theyexpectedofthemselves.

Results with the mean score of 7.20 shows high confidence in coping expressed by the singlemothers as they feel hopeful about life. Despite of the numerous stressors and demands Singlemothers face, they report moderate to high level of life satisfaction (Nelson-Coffey et al.,2019).EventhenSocietyneedstoemphasizethe importanceofSocialSupport,personalresilienceandpositivecopingstrategiesincontributingtothesubjective well-beingofsingle mothers.

The respondents feel better personality strength in dealing with critical and unexpectedsituationswhichpossiblyreflects positivementalhealthandmentalmastery.

Mean score of 7.00 shows that the single mothers show high transcendence which means theyrelate to life experiences beyond the ordinary and reflect feelings which are spiritualistic innature.They feelbound and feelbelongedtotheirwayoflifeexperiences..

Respondentsshow average family group support with the mean score of 6.20 and averagesocial support with mean score of 6.00.The results affirms that families of single mothers aremoderately supportive, cohesive and emotionally attached.This means the respondents could bepossiblybeindependentswithlittleattachmentand supportfromthefamilywhich makes they experience average family support and society support in terms of feelings ofsecurity and density of social networks is also found to be average.Strong social networks,including family, friends and community resources in enhance subjective well-being of singlemothers(Eshleman,1998).

Mean score of 6.03 reveals that, Single mothers show average level of primary group concern.This could be predictably mean that the respondent feel secure and has adequate socialnetworks which makes them feel secured.It also reveals that social environment beyond familyissupportive.

Mean score of 12.90, which is lower than cut off in inadequate mental mastery, result says thatrespondents have adequate mental mastery over self and environment which means they havesense of sufficient control over everyday challenges which could possibly not disturb theirmental equilibrium. Having high score in this factor means the respondents have less subjectivewellbeing.

Mean score of 12.77 shows that single mothers have high perceived ill health. This means thatthey fell unhealthy in terms of health which could be the result of combination of traitsinclusive of happiness and worries over health and physical fitness. It could also be inclusive ofsleeplessness, physiological dysfunctionsduetopsychologicalandemotionaldisturbances.

The single mothers exhibit average in deficiency of social contacts with the mean score of 6.20.The single mothers may be facing worries of being disliked and feeling if missing friends. Thiscanalso beafactor inexpectationachievement discrepancytoo.

Mean score of 6.57 shows that the respondents have high general well-being negative affectwhich affirms depressed outlook on life apart from specific worries over family andhealth.Unlike general well-being positive affect, this construct highlights the negativity one hasover thelifedueto negativelifeexperiences.

Table 2: Showing results of Single sample t- test for subjective well-being among Singlemothers

	TestValue=0					
					95% ConfidenceInterval of theDifference	
	t	df	Sig. (2-tailed)	MeanDifference	Lower	Upper
GeneralWell-BeingPositiveAffect	17.057	29	.000	5.400	4.75	6.05

ExpectationAchievementCongruence	21.368	29	.000	5.767	5.21	6.32
ConfidenceInCoping	29.226	29	.000	7.200	6.70	7.70
Transcendence	26.222	29	.000	7.000	6.45	7.55
FamilyGroupSupport	16.503	29	.000	6.200	5.43	6.97
SocialSupport	21.784	29	.000	6.000	5.44	6.56
PrimaryGroupConcern	15.096	29	.000	6.033	5.22	6.85
InadequateMentalMastery	18.595	29	.000	12.900	11.48	14.32
PerceivedIllHealth	27.221	29	.000	12.767	11.81	13.73
DeficiencyInSocialContacts	18.984	29	.000	6.200	5.53	6.87
GeneralWell-BeingNegativeAffect	21.472	29	.000	6.567	5.94	7.19
SubjectiveWell-BeingTotal	40.859	29	.000	82.033	77.93	86.14

General well-being positive affect: The t-value is 17.057 with 29 degrees of freedom, and thesignificance level is extremely low ($p < .001$). The mean difference is 5.400, and the 95%confidence interval of the difference falls between 4.75 and 6.05.This suggests that singlemothersexperience significantlyhigher levelsofpositiveaffectcompared tothe testvalue.

Expectation achievement congruence: The t-value is 21.368 with 29 degrees of freedom, andthe significance level is very low ($p < .001$). The mean difference is 5.767, and the 95%confidence interval of the difference ranges from 5.21 to 6.32.This indicates that single mothershavesignificantlyhigher levelsof congruence betweenexpectationsandachievements.

Confidence in coping: The t-value is 29.226 with 29 degrees of freedom, and the significancelevel is extremely low ($p < .001$). The mean difference is 7.200, and the 95% confidenceinterval of the difference is between 6.70 and 7.70.This suggests that single mothers havesignificantlyhigherlevelsofconfidence intheircoping abilities.

Transcendence: The t-value is 26.222 with 29 degrees of freedom, and the significance levelis extremely low ($p < .001$). The mean difference is 7.000, and the 95% confidence interval ofthe difference ranges from 6.45 to 7.55.This indicates that single mothers experiencesignificantlyhigherlevelsoftranscendence.

Family group support: The t-value is 16.503 with 29 degrees of freedom, and the significancelevelisextremely low($p < .001$).Themeandifference is 6.200,and the95% confidence interval of the difference falls between 5.43 and 6.97.This suggests that single mothers perceivesignificantlyhigherlevelsofsupport fromtheirfamilygroups.

Social support: The t-value is 21.784 with 29 degrees of freedom, and the significance level isextremely low ($p < .001$). The mean difference is 6.000, and the 95% confidence interval of thedifference ranges from 5.44 to 6.56. This indicates that single mothers perceive significantlyhigher levels ofsocial support.

Primary group concern: The t-value is 15.096 with 29 degrees of freedom, and thesignificance level is extremely low ($p < .001$). The mean difference is 6.033, and the 95%confidence interval of the difference falls between 5.22 and 6.85. This suggests that singlemothershave significantly higher levelsofconcernfortheirprimarygroups.

Inadequate mental mastery: The t-value is 18.595 with 29 degrees of freedom, and thesignificance level is extremely low ($p < .001$). The mean difference is 12.900, and the 95%confidence interval of the difference ranges from 11.48 to 14.32.This indicates that singlemothersexperience significantly higher levelsofadequatementalmastery.

Perceived ill health: The t-value is 27.221 with 29 degrees of freedom, and the significancelevel is extremely low ($p < .001$). The mean difference is 12.767, and the 95% confidenceinterval of the difference falls between 11.81 and 13.73. This suggests that single mothersperceive significantly higherlevels ofillhealth.

Deficiency in social contacts: The t-value is 18.984 with 29 degrees of freedom, and thesignificance level is extremely low ($p < .001$). The mean difference is 6.200, and the 95%confidence interval of the difference ranges from 5.53 to 6.87.This indicates that single mothersexperience significantly higher levels ofdeficiencyinsocialcontacts.

General well-being negative affect: The t-value is 21.472 with 29 degrees of freedom, and thesignificance level is extremely low ($p < .001$). The mean difference is 6.567, and the 95%confidence interval of the difference ranges from 5.94 to 7.19.This suggests that single mothersexperience significantly lowerlevels ofnegativeaffect.

Additionally, the subjective well-being total shows a t-value of 40.859 with 29 degrees offreedom, and the significance level is extremely low ($p < .001$). The mean difference is 82.033,and the 95% confidence interval of the difference falls between 77.93 and 86.14.This indicatesthat single mothers have significantly higher levels of subjective well-being. Overall, theseresults suggest that thesingle mothers generally experience higher levels of subjective well-beingin thegiven aspects.

Table3: showingPearson’sCoefficientofcorrelationbetweenareas ofsubjectivewell-being

	General well-beingPositive Affect	ExpectationAchievement Congruence	ConfidenceIn Coping	Transcendence	Family Group Support	SocialSupport	Primary Group Concern	InadequateMental Mastery	PerceiveIll-health	DeficiencyInSocialContacts	General Well-beingNegativeAffect	**Subjectivewell-being Total**
General Well-being Positiveffect	1	.630**	.363*	.639**	.354	.171	-.031	.142	.324	.007	.489**	.656**
Expectation chievemento ngruence	.630**	1	.318	.319	.186	.046	.109	.290	.403*	.149	.445*	.664**
Confidence Inoping	.363*	.318	1	.192	.097	.085	-.318	.031	.372*	.097	.192	.357
Transcendence	.639**	.319	.192	1	.630**	.172	.043	-.366*	-.147	-.119	.155	.294
Family Groupupport	.354	.186	.097	.630**	1	.500**	.197	-.306	-.154	-.114	.016	.314
SocialSupport	.171	.046	.085	.172	.500**	1	.543**	-.168	.027	.179	.109	.399*
Primary Grouponcern	-.031	.109	-.318	.043	.197	.543**	1	-.136	.161	.236	.051	.324
Inadequate Mentalastery	.142	.290	.031	-.366*	-.306	-.168	-.136	1	.510**	.419*	.638**	.539**
Perceived Illealth	.324	.403*	.372*	-.147	-.154	.027	.161	.510**	1	.303	.561**	.683**
Deficiency InocialContacts	.007	.149	.097	-.119	-.114	.179	.236	.419*	.303	1	.398*	.506**
General Well-eing Negativeffect	.489**	.445*	.192	.155	.016	.109	.051	.638**	.561**	.398*	1	.778**
Subjective Well-Being Total	.656**	.664**	.357	.294	.314	.399*	.324	.539**	.683**	.506**	.778**	1

**.Correlationissignificantatthe0.01level (2-tailed).

*.Correlationissignificantatthe0.05level (2-tailed).

As per the results acquired through Pearson’s Coefficient of correlation, value of 0.363shows that there is significant correlation between general well being positive affect andconfidence in coping ($p < .005$). The areas like expectation achievement congruence(0.630),transcendence(0.639), general well-being negative affect (0.489) and over all subjective well-being(0.656) results show significant ($p < .001$) . Areas like family group support(0.354),social support(0.171), primary group concern(0.031), inadequate mental mastery(.142),perceived ill health(.324), deficiency in social contacts(0.007) show no significant correlationwithGeneral wellbeing positiveaffect.

Expectation Achievement Congruence has significantcorrelation($p < .005$) withperceived ill health (0.403) and General well being negative affect (0.445) .General well-beingpositiveaffectwithvalue.630andSubjectivewell-being (0.664)hassignificantcorrelation($p < .001$).Few areaslikeconfidence incoping,transcendence,familygroup support,social support, primary group concern, inadequate mentalmastery and deficiency in social contactsexhibitno significantcorrelation withexpectation achievementcongruence.

Significant difference is observed in correlation($p < .005$) between Confidence incoping and General well-being positive affect (0.363). It is observed that no other areas showsignificantcorrelation to confidenceincoping.

There is significant correlation($p < .005$) in areas ofTranscendence and inadequatemental mastery with the coefficient of correlation(0.366) where as Carl Pearson's coefficient ofcorrelationin general well-being positive affect (0.639) and family group support (0.630)signifies that in these areas there is significant correlation($p < .001$). In areas like expectationachievementcongruence,confidenceincoping,socialsupport,primarygroupconcern,pe rceived ill health, deficiency in social contacts and general well being negative affect , thevaluesshownosignificantcorrelation withtheareaof Transcendence.

Family group Support as an area of Subjective Well-being of single mothers showssignificant correlation ($p < .001$) with transcendence(0.630) and social support (0.500) . Theother areas like General well-being positive affect,expectation achievementcongruence,confidence in coping, primary group concern, inadequate mental mastery,perceived ill health, deficiency in social contacts and general well-being negative affect shownosignificant correlation to family group support.

As per the Pearson's coefficient of correlation values, there significant correlationbetween subjective well-being(0.399) and social support ($p < .005$). Subjective well-being ofsingle mothers depends highly on the social support they receive in terms of satisfaction of life(Eshleman,1998). Areas like family group support(0.500) and primary group concern(0.543),there is significant correlation ($p < .001$). Other factors like General well-being positiveaffect,expectation achievement congruence, confidence in coping, transcendence,inadequatemental mastery,perceived ill health, deficiency in social contacts, general well being negativeaffectshowno significant correlationwith Social support.

Primary Group Concernhas significant correlation with Social support(0.543) whereasother areashave no significantcorrelationwithPrimarygroupconcern($p< .001$).

Results show that Inadequate mental mastery has significant correlation($p < .005$) withtranscendence (0.366) and deficiency in social contacts(0.419). In areas like general well beingnegative affect(0.638) and subjective well being(0.539) , significant correlation is observedwith Inadequate Mental Mastery($p < .001$). Other factors do not exhibit significant correlationwithinadequatemental mastery.

Perceived ill health of single mothers has significant($p < .005$) correlation withexpectation achievement congruence(0.40) and confidence in coping (0.372). Areas likeGeneral well being negative affect, Inadequate Mental Mastery and subjective well being havesignificant correlation($p < .001$). General well-being positive affect, transcendence, familygroup support, social support,primary group concern and deficiency in social contacts have nosignificantcorrelation with Perceived ill health.

Inadequate mental mastery with value of .419 and general well being negative affectwith value of .398 have significant correlation with deficiency in social contacts ($p < .005$).

Subjective well being withvalue of .506 has significant correlation with inadequate deficiencyof social contacts($p < .001$), where as the remaining areas of Subjective well being scale havenosignificant correlation with deficiencyofsocial contacts.

General well-being negative affect has significant correlation ($p < .005$) withexpectation achievement congruence(0.445) and deficiency in social contacts(0.398).Generalwell-being negative affect has significant correlation($p < .001$) with inadequate mentalmastery(0.638),perceived ill health(0.561) and subjective well being(0.778). Areas like Generalwell-being positive affect, confidence in coping, transcendence, family group support, socialsupport and primary group concern have no significant correlation withgeneral well beingnegative affect.

Total score ofPearson's Coefficient of correlation of Subjective well being amongsinglemothershassignificantcorrelationwithsocialsupport(0.399)atthe 0.05level. Subjective well being has significant correlation with general well being positiveaffect,expectation achievement congruence,inadequate mental mastery, perceived ill health,deficiencyin socialcontactsandgeneralwellbeing negativeaffectat0.01levelofsignificance.Factors like confidence in coping,transcendence,family group support and primary groupconcern havenosignificantcorrelationwithsubjective wellbeingasperthedata collected.

Conclusion:

Single parenting is a global issue which requires more attention from Researchers and SocialWorkers in order to reduce the consequences of various burdens they face due to social,psychological and economic challenges.Single motherhood is an emerging situation in modern era, where both positive andnegative experiencesare experiencedamongsingle mothersdependingonthereasonfor motherhood. However, it is to be understood that in the times of unexpected challenges,nurturing a child in the absence of his/ her father is a major challenge considering theassociatedresponsibilities, challengesand pressure ofleadinghappy life.

Thus, Subjective well-being which is also a measure of happiness could be seen fluctuatingamong single mothers based on their economic, family, psychological, emotional and healthstatus. However, the results of the present study says that the single mothers face higher levelsof Subjective Well-being. Based on the results, a module can be developed focussing on thepossible interventions to help single mothers in required areas and provide interventions to helpthemdealwiththeissuestheyare going through.`

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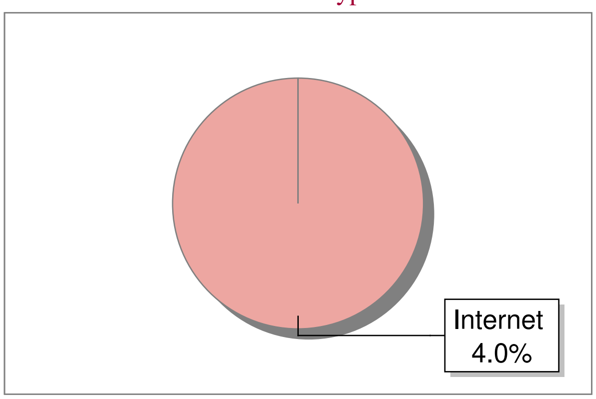

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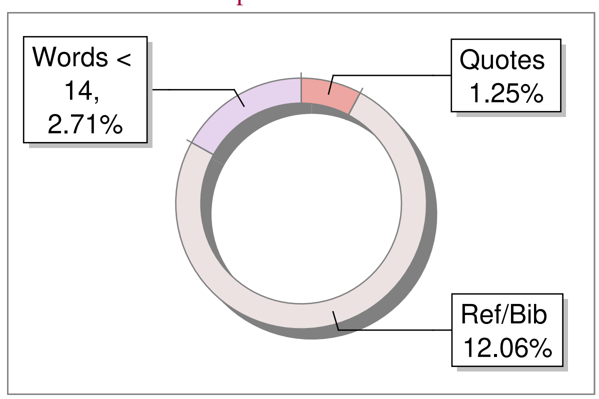

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Title: Review study to explore the deeper insights into the pose Bhujangasana and its role in healing back pain.

Abstract:

Background: Yoga is a comprehensive wellness technique that emphasizes both the body and the mind. Yoga asanas are static stretching poses performed to gain strength, stability, range of motion, and flexibility. It is practiced to release the body from stiffness and pain and attain relaxation.

Aim of the Study: To explore the role and effectiveness of the Bhujangasana practice in back pain conditions.

Methods: PubMed, Google Scholar, and Cochrane databases were searched for information about Bhujangasana using keywords.

Discussions and Conclusions: Bhujangasana as a back-bending pose represents a supple spine and equanimity in thoughts, increases awareness, and wards off fear. It is one of the postures found to be useful for treating back pain conditions. Bhujangasana pose is recommended for those with stiff back. This pose strengthens the neck and upper back and diminishes kyphosis and sciatica. It increases the flexibility and blood circulation in the pelvis and alleviates lumbago and prolapsed discs in the spine. It is considered the panacea pose for back pain conditions as it counteracts any habitual distorting of the normal spinal curves and supports the spinal column.

Keywords: Asana, back pain, back bending pose, Bhujangasana, biomechanics.

Introduction

Yoga is widely used as a mind-body therapy to relieve back pain. It is a system that helps bring a balanced approach to our lives. The reasons for the occurrence of diseases are explained in Yoga-shastra as Purva-janmavritti (deeds of previous birth), Manasika-karma (psychological measures), and Sharirika-karma (physical measures) (Hetal et al., 2014).

The Kleshas (avidya, asmita, raga, dwesha, and abhinivesha) lead to Chitta Vikshepa, which furthers it to psychological issues (Manasikavikara-Arishadvargas) to manifest as a Sharirikavyadhi (physical disease)(Hetal et al., 2014).

In the system of yoga, asanas are understood as static stretching poses that help bring stability and strength to both the body and mind. The practice of asanas stimulates different organs and endocrine glands to regulate metabolic functions. Asanas help release pain and stiffness, induce range of motion and flexibility, and relax the body (Kaduskar&Suryanarayana, 2015).

This study explores Bhujangasana, or cobra pose, and its role in managing back pain. PubMed, Google Scholar, and Cochrane library databases were searched using keywords to gather information about Bhujangasana.

Bhujangasana: History

A cobra is called a bhujanga, and a posture is called an asana. Traditionally, Bhujangasana is also known as Nagasana or Sarpasana, meaning "Snake or Cobra Posture." It symbolizes rebirth, death, and mortality, as casting a snake's skin results in a new life. Bhujangasana represents overcoming fear and venom. Nagas also represent venom and fear(Jyoti et al., 2019).

Gheranda Samhita is one of the three classical Hatha Yoga scriptures of the 17th century that describes the posture. The cobra pose is the penultimate pose of the thirty-two poses provided in this manuscript. "Place the palms on the ground, and raise gently the upper part of the body (from navel to head) like a snake" says Gheranda Samhita(4) .

Rudrayamala describes the same asana as Sarpasana, where the body is placed straight like a stick (in prone position), feet connected, and the upper part of the body is raised on palms. If one does so, one will experience the Kuṇḍalini in an adorned form (5)(6).

Cobras symbolically represent "enlightened states" in Buddha's depictions. As a coiled serpent at the base of the human spine they represent Kundalini Shakti. Lord Ganesha wears it around his waist to represent mastery over fears

The Rudrayamala describes the same asana as the Sarpasana, executed by placing the body straight like a stick (in prone position), joining the feet, hoisting up the upper part of the body on palms, and adopting the position of a lifted hood. By doing so, It is said that by doing so, one will experience the Kuṇḍalini in an adorned form(Thripathi. AcharyaShriRamaprasada, 1991)(Sriharisukesh&Pailoor, 2019).

This cobra pose above the head in the depictions of Buddha symbolically represents an "enlightened state." As a coiled serpent at the base of the human spine it represents the "Kundalini Shakti". As a belt around the waistline of Lord Ganesha, it represents "mastery over fears".

Lord Shiva wears this snake around his neck to represent Avidya, the veil of ignorance and illusion. Lord Shiva (Adiyogi) describes a snake yogic pose as having a supple spine and equanimity in thoughts. Bhujangasana or Sarpasana is the posture that awakens Kundalini (GherandhaSamhita and Rudrayamala)(Sriharisukesh&Pailoor, 2019).

Bhujangasana: Yogic Physiology

Bhujangasana and Shalabhasana are mentioned in yogic texts, and these asanas may be useful for katishool (low back pain). Bhujangasana is also a part of the Surya Namaskar sequence, appearing in steps 7 and 8 in Chandranamaskar(Saraswati, 1997). Practice of Bhujangasana as a back-bending pose supports the downward movement of apanavayu placing pressure on the nabhi (navel) and basti (bladder). It also stimulates udanavayu(Bhati et al., 2015). Bhujangasana increases body heat, kills disease and awakens kundalini. This pose stimulates the spleen, stomach meridians in the front of the body and governs the channels of the heart and small intestine meridians of the arms(Ankit, 2023).

Bhujangasana- Western Physiology

Bhujangasana stretches and strengthens the muscles of the shoulders, abdomen, chest, and lungs and firms up the buttocks. The pose practice opens up the lungs and heart, which aids in deeper exhalation. This creates a therapeutic effect for respiratory disorders (Morse, 2007), improves body mass index (BMI), and regulates blood pressure(Chauhan et al., 2017). Bhujangasana stimulates and compresses the organs in the abdominal region to relieve constipation (Sinclair, 2011)and improve menstrual irregularities, such as dysmenorrhea (Rakhshaee, 2011). It helps lower insulin levels and improves fat redistribution and glucose utilisation(Malhotra et al., 2005).Adopting this posture, the production of steroid hormones can be controlled by neural mechanisms (Minvaleev et al., 2004).

Bhujangasana pose is recommended for those with stiff backs. This pose strengthens the neck and upper back and diminishes kyphosis and sciatica. It eases lumbago and prolapsed discs in the spine while increasing flexibility and blood circulation in the pelvis(Jyoti et al., 2019).

Psychology of Bhujangasana/Cobra practice (CP):

"Feelings of elation and upliftment" are boosted by CP. The CP has the capacity to act as a natural antidepressant because it promotes an increase in energy levels, resulting in the chasing away of fatigue, depression, and sadness (Rathore et al., 2013). Bhujangasana represents a cobra when it is the most alert and aware of its surroundings. This cobra posture represents our ability as humans to face our fears and not shy away from what we dread. The open chest in the posture helps expand the lungs for gentle but deep inhalations and exhalations.Bhujangasana, or cobra pose, is traditionally thought to increase body heat. When the body's heat is freed to rise through the repeated practice of meditation and yoga, it creates a sense of liberation(Ankit, 2023).

Types of Bhujangasana(Jyoti et al., 2019)

There are four types of Bhujangasana.

1. **Cobra pose (Saral Hasta Bhujangasana):**Asana in which the head is raised like a serpent's hood (Saral Hasta Bhujangasana)**.** From a health perspective, Cobra pose has special significance in Hatha Yoga.
2. **Curved hands cobra pose (Vakra Hasta Bhujangasana):** A cobra pose with curved hands (Vakra Hasta Bhujangasana) enhances digestive efficiency.
3. **Half cobra pose (Ardha Bhujangasana)**: This is also known as sphinx pose. For people with stiff backs, this asana helps to provide flexibility.
4. **Cobra pose with raising palm:** The buttocks will benefit from this yoga exercise. Besides reducing fat around the waistline, it also improves the appearance of the buttocks.

Biomechanics of Human spine

The human spine functions as a bony protector of the delicate spinal cord and enables motion in all three planes. In this study, the lumbar region of the spine is of particular interest because low back pain is a major medical and socioeconomic problem in modern times.

The spine consists of a curved stack of 33 vertebrae, divided structurally into five regions. Cervical, thoracic, and lumbar vertebrae differ structurally and move differently due to the ribs. Two adjacent vertebrae and the associated soft tissues are considered the functional unit of the spine. Spinal movement is the combination of: Intervertebral joints Facet joints: intervertebral joints on the anterior side and two gliding diarthrodial facet joints on the posterior side(Sumchai, 2015).

Bhujangasana: Biomechanics

The biomechanics behind various yogic postures and their effects on the neuromuscular system are stated to be the fundamental aspect of the science of yoga. Cobra Posture (CP) is **a** back-bending pose that is said to be one of the most energetic and exhilarating members of the yogasana group. The main goal of CP is the extension of the spine and the opening of the chest. This pose favours the extension of the spine and expands the thoracic cage, besides enhancing the flexibility of the vertebral column. The entire vertebral column is strengthened, while the buttocks and legs are toned. This results in enhanced circulation, which finally has tremendous positive influences on the general systems of the body. The CP pose comprises three subsidiary movements at the cervical, thorax, and lumbar vertebrae. With more emphasis on lumbar vertebra extension, it affects the knees, intervertebral, and hip joints. It gives a plantar flexion movement to the ankle joint and an external rotation to the glenohumeral joint (Rathore et al., 2013).

Extension effect of CP practice

When the lumbar vertebra has an extension effect, it tilts the upper vertebra and moves it posterior. In this pose, the intervertebral disc becomes flatter posteriorly and thicker anteriorly, which results in stretching over the anterior longitudinal ligaments. A relaxed posterior longitudinal ligament, however, results in a greater interlocking between the superior and inferior articular processes; thus, the bony structure of the arch and the anterior longitudinal ligaments limit the extension of the lumbar vertebra. The movement of the sacrum circulates the spinal fluid. Stretching resets, the resting tension in the muscles alongside the spine and strengthens and re-patterns the specific muscles(Rathore et al., 2013).

The movements in the hip joints take place in the transverse axis and frontal plane. This also extends and flexes the knee and limits the range of hip extension through the contraction of the hamstring muscle. The hip joint extension is further increased by the anterior tilting of the pelvis due to an exaggeration of the lumbar lordosis(Rathore et al., 2013).

Other movements that influence the CP are internal rotation and adduction of the hip joint, knee extension, ankle planter flexion, glenohumeral joint external rotation, elbow extension, and forearm pronation. The muscles that limit backward bending in the hip include the quadriceps femoris, psoas, iliacus, and abdominal muscles. Moreover, the erector spinae muscle group (iliocostalis, longissimus, and spinalis) aids in hip extension (16). Quadratus lumborum, iliocostalis lumborum, longissimus thoracis, and spinalis are all deep lower back muscles or posterior muscles originating and inserting on the spine that help with spine extension (Rakhshaee, 2011).

Spine Extension: The deep back muscles involved as the prime movers include the spine extensors, namely, intertransversarii, interspinalis, multifidi, spineless, semispinalis, splenius capitals, and longissimus. These muscles work concentrically and create spine extension. Also, the serratus posterior superior muscle synergizes with the erectors to enhance chest expansion. Moreover, the rectus abdominis and oblique muscles limit the over mobilization of the lumbar spine. The prime mover for the hip extension is the hamstring muscle group, mainly the semitendinosus and semimembranosus, along with the gluteus maximus muscle. In the case of weakness of the hamstring muscle, the gluteus maximus muscle does the hip extension, in which case the internal rotation and hip extension movements are lost (Ankit, 2023; Rathore et al., 2013). Table 1 gives a description of the physioanatomical aspects of Bhujangasana and its effect on back pain.

Table 1: Physio anatomical aspect of Bhujangasana and its effect on Low back pain (Ankit, 2023; Minvaleev et al., 2004; Sumchai, 2015)

Sl.No	Muscles and Joint	Action
1.	Neck and Upper back	Loosening the back muscles relieves the strain on the back and neck. The cervical extensors support extension, while the cervical flexors lengthen the neck to stabilise it. It prevents the head from dropping back and creates the curve on the neck and spine.
2.	Trapezius	This muscle is partly responsible for the movement of the head and neck. This muscle extends from the back of the head down to the shoulder blade. The spinal extensors engage to extend the spine while your abdominals stretch. Your pectoralis major stretches as you broaden your chest while adducting your shoulder. Rhomboids and trapezius engage for retracting.
3.	Erector Spinae	The spinal extensor groups (intertransversarii, interspinalis, and spinalis) work concentrically to create extension. These are the collection of muscles and tendons in the back that regulate the extension and rotation of the spine. As erector spinae muscles straighten the spine, the yoga cobra pose is closely related to their resilience.
4.	Shoulder joint	Shoulders are externally rotated in Bhujangasana. The upper limb is kept straight. The scapula is almost in a neutral position. Serratus anterior maintains a neutral scapula against arm pushes.
5.	Upper Arms	The triceps engage to resist gravity, pressing into the ground and moving towards elbow extension. Maintaining some elbow flexion. biceps engage to stabilize. The passive forearm variation (sphinx pose) can be a great option for hyper kyphosis of the thoracic spine, preventing dysfunction or a Dowager's hump.
6.	Elbows	Straighten the upper limbs in Bhujangasana. The forearm is in a pronated position. To maintain the extension of the elbow. To maintain the extension of the elbow, the triceps are actively contracted.
7.	Pronators	Pronators engage to pronate their forearms, pressing their thumbs more firmly into the mat. A key muscle, the serratus anterior, can refine cobra pose. Pronating your breast bone forward to reduce pressure in your spine. This also activates the serratus anterior muscle, which helps with functional movements like reaching your arms forward. Strengthening them could relieve some neck and shoulder pain.
8.	Abdominal muscles- Rectus abdominis	Between the ribs and the pelvis are the abdominals. They govern the pelvic tilt and the lower spine curve. Cobra pose stabilizes the spine by engaging the transversus abdominis muscle.
9.	Hip region	The extensor portion of the adductor magnus along with the gluteus maximus also extend the hips.
10.	Thighs	Your gluteus maximus adductor, magnus, and hamstring engage to hold your hips in extension, while your tensor fasciae latae and iliotibial band stabilize your hips.
11.	Hamstring	Hip extension in cobra pose focuses on hamstrings. The hamstrings, especially the semitendinosus and semimembranosus, extend the hips and maintain adduction and internal rotation. Hips are stretched, knees bent, and lower legs rotated.
12.	**Knee**	It extends the knee. Vertebrae, vastus and intermedius.
13.	**Ankle**	In Bhujangasana, the ankle joint is plantar flexed. Extensor digitorum

	joint	longus, extensor hallucis longus, tibialis anterior, and peroneus tertius belong to the anterior compartment of the leg, while extensor hallucis brevis belongs to the dorsum of the foot.
14.	Sciatica nerve	Sciatica nerve pain is recognized as tight, soft muscles. Bhujangasana lengthens, expands the spinal cord, giving it a gentle spinal strain to heal the sciatica pain.
15.	At hormonal level	Increases testosterone, decreases cortisol, and changes the levels of dehydroepiandrosterone and aldosterone. It affects not only the adrenal cortex but also the gonads via motor-visceral reflexes.
16.	Lower and Upper Body	Lengthens and strengthens the spine. It tones the biceps, triceps, chest, shoulders, deltoid muscles, and buttocks, leading to a great, healthy physical structure.

Limitation of Bhujangasana:

While doing this pose, the pelvis may be lifted off the ground. Secondly, pain may be encountered by the subjects in the spine area. According to Iyengar, pain during the CP is due to a weak area of the spine and back muscles. "Where there is a pinching feeling, that part of the spine is contracted, and the intervertebral discs rub against each other. Some subjects tend to use the latissimus dorsi and other more superficial muscles because they create flexion of the upper back and also interfere with breathing by inhibiting the movement of the ribs. Moreover, the pushing of the arm is another obstacle because it lifts the spine while the serratus anterior muscle is active to maintain the neutral position of the scapulae. This CP may not be effectively performed in cases of frozen shoulder, supraspinatus tear, or supinator tightness. Many subjects may have spinal or hip inflexibility (Coulter & McCall, 2001) .

Conclusions

Bhujangasana aims to reinforce the spine and stretches everything between the navel and the chin. Bhujangasana can be considerably effective at relieving distress in the back, neck, and abdominal muscles. Bhujangasana pose is recommended for those with stiff backs. It is considered the panacea pose for back pain conditions. This pose strengthens the neck and upper back and diminishes kyphosis and sciatica. This pose increases the flexibility and blood circulation in the pelvis and alleviates lumbago and prolapsed discs in the spine. It is very helpful in counteracting any habitual distortion of the normal spinal curves. The muscles along the spine are strengthened, helping to support the spinal column.

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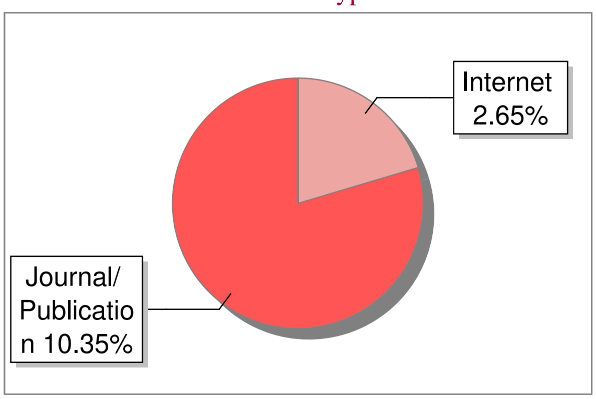

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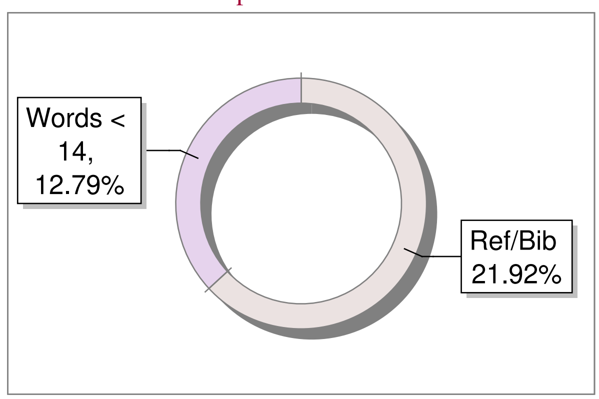

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Long term stored *bhoomi kadamba* (*Sphaeranthus indicus)* and its acclaimed medicinal properties

Abstract:

Sphaeranthus indicus, commonly known as bhoomi kadamba or mundi, belongs to Asteraceae family. It is a weed loaded with medicinal properties and used fresh in India. In this study, extracts of long term stored *Sphaeranthus indicus* were used to analyse antimicrobial and antioxidant activities. Results showed that, chloroform extract was inhibiting *Staphylococcus aureus* and *Escherichia coli* strongly whereas *Candida albicans* and *Salmonella typhimurium* were weakly inhibited. Plant extracts also showed moderate antioxidant activities as evidenced by DPPH and nitric oxide scavenging activity. As the extracts showed moderate activities, it justifies the importance of the fresh plant material to treat several ailments and to do vigorous tests while using the long term stored plant parts with respect to *bhoomi kadamba*.

Key words: *Sphaeranthus indicus,* bhoomi kadamba, antimicrobial, antioxidant, long term storage.

Introduction:

Every civilization that existed on earth in the past to the modern society has used plants as source of food, antioxidants, metabolites, medicines etc. Most plants play an important role in people's lives and influence our day-to-day functions in many ways. In Indian traditions and customs, almost every plant is considered medicinal [Astanga Hridaya (Sutra: 9-10)]. Indian system of medicine Ayurveda is in practice since ages because of the presence of diverse flora in our country. The Ministry of Environment, Forests and Climate Change (MoEFCC), India, has identified and documented over 9500 plant species of importance to the pharmaceutical industry. Even today plants are collected from the wild rather being cultivated in the farmland. The shift from collection to cultivation of medicinal and aromatic plants may ensure purity, authenticity and sustainable supply of raw drugs. Foreign exchange earning potential from these groups of plants in India is estimated to be over US$ 3000 million per annum (Reddy, 2010). However, in many cases, agriculturally grown plants were found inferior than wild which forces the traditional practitioner to gather them from wild (Pandey et al, 2014; Finnie & van Staden, 1991). Increasing urbanization has led to thinning of the forests and loss of biodiversity. It forces people to ruthlessly exploit plants in the name of collection and storage for long duration of time before use due to the demand from the commercial sector. Therefore, it is important not only to preserve these valuable plant species, but also to develop sustainable cultivation practices to meet all the needs of the domestic industry and also to take advantage of the good prospects for current exports.

Sphaeranthus indicus is locally known as Bhoomi kadamba or mundi. It belongs to the composite family (Asteraceae) and is considered a noxious weed on cultivated land throughout India. This plant is a branched, highly fragrant annual with a winged stem and the wings are toothed. Leaves are obovate or oblong, narrowed at the base, dentate and serrate. The flowers are in compound heads, globose ovoid; the flowering time is in winter, that is, from November to January. Many parts of the plant find application in Ayurveda and in traditional medicine (Upadhyay & Mishra, 2011). The herb is reported to be useful in treating indigestion, asthma, leucoderma, dysentery etc. An isoflavone glycoside from leaves and a new sesquiterpene glycoside sphaeranthanolide isolated from flowers was proved to be an immune booster (Shekhani et al., 1990). The plant is hot, laxative, digestive, tonic and anthelmintic in nature. It is also used to treat tuberculosis, bronchitis, splenic disorders, anemia, uterine and vaginal pain, hemorrhoids, and vomiting (Chopra et al., 1956). Because of the availability issues, these day people store the collected plant for several months before use. The claimed medicinal properties above generally refer to the fresh plant samples. No reports on the long term preserved specimen are available with respect to mundi. Accordingly, aim of the present study is to test the effects of long-term stored *Sphaeranthus indicus* with respect to its antimicrobial and antioxidant activities.

Materials and Methods:

Collection of plant materials:

Fresh parts of *Sphaeranthus indicus* were collected from Belthangadi taluk, Dakshina Kannada, during November – December 2020. The plant materials were taxonomically identified and a herbarium preparation of the plant was deposited in the department of botany, SDM College, Ujire. Plant materials were shade dried, ground well to a fine powder and stored in an air-tight container until analysis after one and half years before the experiments.

Preparation of the extracts:

Hot water extraction:

Five gram of powder was taken in a beaker filled with 200 ml of distilled water. The mixture was heated on a hot plate with continuous stirring at 30 – 40^{0}C for 20 minutes. Then the water extract was filtered through Whatman 41 filter paper and the filtrate was used for the phytochemical analysis. The water extract was stored in refrigerator till use (Yadav & Agarwal, 2011).

Soxhlet extraction:

About 100 gm of powdered plant material was packed neatly into a thimble and extraction was carried with 250 ml of chloroform. The extraction process was done overnight. After that, extract was collected in a RB flask and solvent was evaporated in a rotary flash evaporator. Dried extract was stored in refrigerator for further use.

Antimicrobial activity assay:

Preparation of nutrient agar medium for *Escherichia coli* and *Staphylococcus aureus*:

Required quantities of beef extract (1.0 gm), yeast extract (2.0 gm), peptone (5 gm) & NaCl (5 gm) were dissolved in 1 litre distilled water. pH was adjusted to 7.2. Fifteen gram of agar-agar was suspended and the media was autoclaved at 121^{0}C for 20 mins. Then, the molten media was dispensed into sterile Petriplates and rested to solidify.

Preparation of yeast extract dextrose media for *Candida albicans*:

Required quantities of yeast extract (3.0 gm), peptone (10 gm) & dextrose (20 gm) were dissolved in 1 litre of distilled water and the pH was adjusted to 7.4. The media was solidified with 15 gm of agar-agar, autoclaved and dispensed into Petriplates as sbove.

Preparation of tripticase soya agar medium for *Salmonella typhimurium*:

Required quantities of Glucose (5 gm), pancreatic digest of casein peptone (15 gm), soyabean digest (5 gm) & NaCl (5 gm) were dissolved in 1 litre of distilled and the pH was adjusted to 7.3. Media was solidified with 15 gm of agar-agar, autoclaved and dispensed as above.

Antimicrobial activity test:

Sample was prepared with DMSO in the concentration 100 mg/ml.

Agar well diffusion method:

Around 15 ml of the medium was dispensed in Petridish and preparation of microbes which are capable of forming around 1 x 10^4 CFU were seeded on the plate and allowed to dry on laminar air flow cabinet for 30 mins. After solidification, 3 wells were dug and 100 microlitres of the extract were loaded in the well to find out the sensitivity against the different microbes. DMSO was used as a control. Ampicillin and Fuconazole standard discs (Himedia Laboratories Private Limited, Mumbai, India), were used as a reference discs for bacteria and fungi respectively. The seeded plates were incubated at 37°C for 24 h and at

25°C for 72 h for bacterial and fungal cultures respectively. The diameter of the inhibition zone developed, if any, was measured in millimeters. Studies were performed in triplicates and the developing inhibition zones were compared with those of the reference discs.

Antioxidant activity analysis:

DPPH method: Ten mg of the sample was dissolved in 10 ml of chloroform (stock solution). Stock solution was further diluted to obtain the final concentration range from 2 µg/ml - 10 µg/ml (George et al., 2004). DPPH (1, 1-Diphenyl-2-picrylhydrazyl) is a stable free radial with purple colour (absorbed at 517nm). If free radicals have been scavenged, DPPH will degenerate to yellow colour. This assay uses this character to show free radical scavenging activity.

Nitric oxide scavenging test: The nitric oxide scavenging activity of the extract was analyzed as per Ebrahimzadeh et al. (2008). Distilled water served as the blank. Nitric oxide produced from sodium nitroprusside was measured by Greiss reaction. The absorbance of the mixture was measured with a Double beam UV-visible Spectrophotometer (SYSTRONICS 2201) at 540 nm. Nitric oxide radical scavenging activity was calculated according to the following formula:

$$\textbf{\% Inhibition} = \frac{A_O - A_1}{A_O} \times 100$$

A_O = Absorbance of control; A_1 = Absorbance of extract

Results and discussion:

Phytochemical analysis of the water extract (data not shown) confirmed the presence of tannins, phenols, steroids, fats and oils and saponins. Though the sample was old, it still retained many of the phytochemicals as per the reports on fresh preparations (Ambavade, 2006; Bafna & Mishra, 2007; Duraipandiyan *et al*., 2009). The chloroform extracts were subjected to antimicrobial and antioxidant analysis. The dose was deliberately fixed at higher levels (10 mg/100 µl). It was observed that the chloroform extract of the *S. indicus* showed moderate antimicrobial activity against the pure cultures of *E. coli* and *S. aureas* (Table 1). Further, the chloroform extract of the *S. indicus* showed mild antimicrobial activity against the pure cultures of *S. typhimurium* and *C. albicans* at the tested concentration (Table 1). Urzua & Mendoza (2003) reported that hexane extracts of flower and aerial parts of *S. indicus* showed good antimicrobial effect against coliform bacteria. Duraipandiyan et al., (2009) reported that ethanolic extract of *S. indicus* exhibited significant antibacterial and antifungal activity against *B. subtilis* and *S. aureus* as well as *Candida* and *Aspergillus* respectively.

Table 2 depicts results related to the *in vitro* antioxidant activity of chloroform extract of *S. indicus* by DPPH assay. The data obtained show dose dependent mild anti-oxidant activity. The free radical scavenging effect observed with 8 and 10 µg/ml dose level was found to be statistically significant. Table 3 depicts Nitric oxide scavenging assay of *S. indicus* extract. The test extract exhibited a moderate dose independent inhibition of NO formation. Data shows more activity at 4µg/ ml dose level. There is extensive evidence to implicate free radicals in the development of degenerative diseases. Free radicals have been implicated in causation of ailments such as diabetes, liver cirrhosis, nephrotoxicity etc. Reddy (2010) reported that reactive oxygen species such as superoxide anions (O_2), hydroxyl radical (OH) and nitric oxide (NO) inactive enzymes damage cellular components causing tissue injury through covalent binding. The increased production of toxic oxygen derivatives is considered to be a universal feature of stress condition. The data of present study urges manufacturers to consider analyzing biochemical tests as above before using a older specimen for preparing formulations.

Overall, the present study shows that, long term storage affects overall performance of the plant extract and shows reduced antimicrobial and antioxidant activities highlighting the importance of storage conditions. The data obtained thus signifies the importance of fresh collection and preparation of plant extracts for treating various ailments.

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Table 1. Antimicrobial activity of aerial parts of *S.indicus*.

Test strains	Zone of inhibition diameter (mm)		
	S.indicus (10mg/100µl)	Ampicillin (10mg/100µl)	Fuconazole (10mg/100µl)
E. coli	11	19	--
S. aureus	14	18	--
S. typhimurium	6	30	--
C. albicans	7	--	16

Table 2. DPPH assay for anti oxidant evaluation activity

Sl.No	Working sample Conc^n.	Mean±SEM	% Inhibition
1	Control	0.186±0.00693	-
2	2 µg/ ml	0.177±0.00384ns	4.84
3	4µg/ ml	0.175±0.00384ns	5.91
4	5µg/ ml	0.172±0.00152ns	7.53
5	6µg/ ml	0.170±0.00472ns	8.60
6	8µg/ ml	0.161±0.00318**	13.44
7	10µg/ ml	0.160±0.00264**	13.98

ns $p>0.05$ in comparison to control; ** $p<0.01$ in comparison to control

Table 3. Nitric oxide scavenging activity

Sl.No	Working sample Conc^n.	Mean±SEM	% Inhibition
1	Control	0.122±0.00208	-
2	2µg/ ml	0.103±0.00348*	15.57
3	4µg/ ml	0.097±0.00145**	20.49
4	5µg/ ml	0.102±0.00384**	16.39
5	6µg/ ml	0.098±0.00491**	19.67
6	8µg/ ml	0.104±0.00333*	14.75
7	10µg/ ml	0.102±0.00208**	16.39

* $p<0.05$ in comparison to control; ** $p<0.01$ in comparison to control

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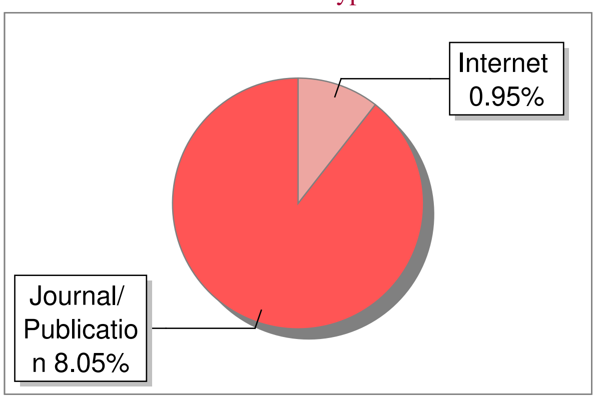

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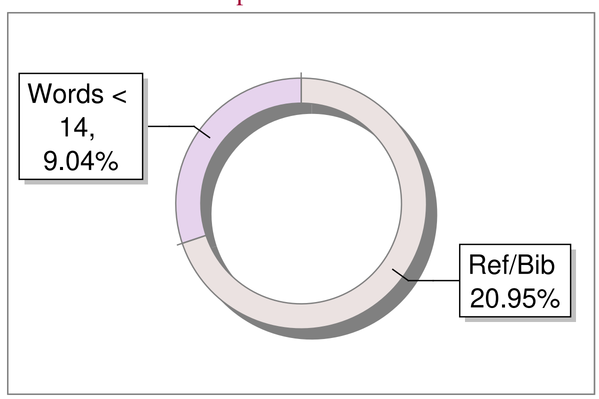

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EMPLOYEE COMPETENCIES AND ORGANISATIONAL PERFORMANCE;A STUDY IN A PETROCHEMICAL COMPANY.

ABSTRACT:

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The purpose of this study is to measure the impact of employee competencies on organizational performance in Refinery and Petrochemical Company in the Mangalore region. The petrochemical and refinery industries were chosen primarily because they are reluctant to adopt such cutting-edge HR methods due to several myths about increased costs, wastage of time, and the lack of immediate and direct benefits etc. Based on the literature reviewed the researcher has selected core competency, leadership competency and social competency as independent variable and organizational performance as dependent variable for the study. 10 Primary data was collected from the 270 employees of the refinery and petrochemical employees through a structured questionnaire. The study adopted descriptive research design, in which 8 both primary and secondary data was used. Correlation and Multiple regression analysis method were used for analyzing the collected data. The study discovered that various competencies had a significant and positive impact on organizational performance. Hence, organizations must carefully plan, create, and put into practice well-articulated competency development strategies and practices in order to enhance employee competencies.

Key words: Core competency, leadership competency, social competency, organizational performance, competency model.

Introduction

Today's problems for industrial and manufacturing companies are entirely different from those of a few years ago. Industrial company management is excessively complicated, and it is now generally understood that an organization's most valuable asset is its human capital. The organizational performance of a company, or its capacity to successfully implement plans to attain institutional goals, determines its likelihood of success. Employees, who are a crucial component of the organization and make up the team that works to accomplish the organization's goals, play a role in how well an organization performs. As a result of numerous recent developments that have complicated the functioning of contemporary business organizations, including fundamental shifts in the nature of work and work organization, the competitive environment's dynamic nature, and the requirement to ensure that stakeholders' interests are aligned with how the organizations are run, new approaches to human resource management are now necessary. Competency is one of these fresh, emerging concepts. The term competence was first used by renowned American psychologist White (1959) in his article, Motivation Reconsidered: The Concept of Competence. He defines competence as the capacity of an organism to interact with its environment effectively. Nevertheless, American social scientist McClelland (1973) greatly popularized and advanced the concept through his important study, 'Testing for Competence Rather Than Intelligence'. In contrast to conventional knowledge and aptitude tests, he thinks that an individual's performance and success in a certain situation or line of work are mostly decided by his or her behavioral traits and qualities. Competency tends to encompass other factors like personality, emotional quotient, and interpersonal relationships.

The requirement to consistently enhance organizational performance includes competitive environment's dynamic character, the need to ensure that organizational management practices align with stakeholders' interests, and the growing importance of inclusivity in strategy development. Employees can become competent and productive by participating in a competency-based development programme that understands and meets the specific job criteria for each role (Connor et al., 2014). Through intensive training and quality assessment using competency methodologies, different talents, methods, attitudes, and knowledge gaps are frequently found to be necessary for effective processing. The competency model priorities functional and technical needs while also taking into account the abilities and expertise required to carry out a certain task. However, for an operation to run efficiently, professional skills are required, which can only be acquired through long-term employment. To increase employee productivity and evaluate employees against established standards, many organizations have developed competency-based training programmes (Maimunah 2011). Boosting employee competencies also significantly improves organizational performance in terms of monetary factors, such as organizational profits or revenues and productivity.

Literature Review and Hypothesis development

According to Osei and Ackah's (2015) analysis of the pharmaceutical industry, employee abilities have a significant and positive impact on organisational performance and play a significant role in achieving the goals and missions of the organisation. According to Yu and Ramanathan (2012), having highly competent employees enables a business to give its clients high-quality products and services, reduce expenses, and introduce a variety of new products and services to the market, all of which lead to an improvement in organisational performance. Employee competencies are essential for performance development, customer satisfaction, and business sustainability (Puteh et al. 2016). Employee skills like self-competence, teamwork, communicative ability, knowledge of change management, and ethical competence have been shown to be positively connected with organisational success (Otoo & Mishra, 2018). Additionally, according to Ramo et al. (2009), employees' emotional and social intelligence has a significant impact on both their performance and the efficiency of organisations.

Competency requirements change over time, it is difficult to establish or create a competency model that is effective for the organisation (Levenson 2005). Because of this, it is nearly arduous and requires significant investigation to ascertain which ability produces the strongest performance predictors. Additionally, if firms are seeking to determine which competency or competencies are the best indicators of organisational performance, having a large number of competency sets may be sending the wrong message. Numerous academic studies on employee competency reveal that the competencies required differ between organisations, jobs, and positions. Because of this, the organisations have established their unique area of competencies. A collection of significant abilities or core competencies needs to be established and identified independent of the roles, positions, and levels that exist in the organisations. An organization's ability to achieve its strategic aim depends on its core strengths.

Silva (2014) asserts that the underlying bond between a manager and his or her followers is the essence of great leadership. According to Garcia-Morales et al. (2012), there is a positive relationship between organisational performance and leadership. The leadership style analyses, modifies, and directs systems, whereas systems are created to share and transfer information through the process of organisational learning. According to Senge et al. (1994), the purpose of organisational knowledge research is to open doors for professionals to develop skills or abilities that provide benefits that can be maintained through improvement. According to Pradhan & Pradhan (2015), the best criterion for assessing a leader's abilities is the organization's performance. A few of the qualities and characteristics that define an effective leader include values, knowledge, intellectual fervour, ethics, charisma, ingenuity, self-assurance, and courage. A capable leader has a stable personality, a sense of purpose, and the abilities needed to make decisions that suit the mission. The success of a company is largely dependent on the competence of its leaders and the organisational culture they establish. According to Sekakubo et al. (2014), leadership abilities can enhance organisational performance by enhancing personnel performance.

People with social skills will be able to get along with others and build strong relationships with them. Due to the complexity of social interactions, social competence is a combination of a number of cognitive skills, emotional processes, behavioural aptitudes, social awareness, and cultural and individual values relevant to interpersonal relationships (Orpinas, 2010). Sucher and Cheung (2015) claim that socially competent employees have the capacity to build and strengthen their networks, develop their skills, and excel in a team environment, all of which contribute to the accomplishment of both individual and group objectives and, ultimately, improved organisational performance.

Based on the previous studies, the current study proposes following hypothesis:

H1: Core competencies have significant impact on organization performance.

H2: Leadership competencies have significant impact on organization performance.

H3: Social competencies have significant impact on organization performance.

Research Methodology

The study's goal is to evaluate the influence of competencies on organisational performance among Refinery and Petrochemicals Ltd. employees in the Mangalore area. The study, which employed a survey methodology, is descriptive in nature. Through the use of a well-structured questionnaire with three distinct sections - demographic data, competency factors (core competencies, leadership competencies, and social competencies, totaling 17 items), and organisational performance - data were gathered from officers and supervisory level employees. The employees were given a total of 300 questionnaires, and 270 responses were taken into account for the final data analysis. 90 percent of the respondents responded.

Measures

The respondents were asked to rate their agreement with the numerous assertions in the second and third sections of the survey using a five-point Likert scale (1 being strongly disagreed with and 5 being strongly agreed). Employee competencies are treated as independent variables in the current study, whereas organisational performance is treated as a dependent variable. The variables affecting competencies were determined using factor analysis. The KMO test and Bartllet's test value were used to establish the appropriate sample size (Kaiser and Rice 1974; Bartllet 1954). The Bartlett's test significance value (p value) for each factor is less than 0.01 and the KMO values for each factor are all greater than 0.75. The items from the questionnaire were used to test the variables' reliability, and it was found that the variables fulfill the standards for reliability. Cronbach's Alpha reliability coefficient is used to determine the validity of data gathered using the Likert five-point scale. The dependability coefficient ranges from 0 to 1. It is evident from past studies that a value of alpha greater than 0.70 is considered to be indicative of a sufficient level of internal consistency among measure items. The Cronbach Alpha reliability values for the respondents' responses to all of the Likert-scale items in the questionnaire's various categories are 0.089 for core competencies (5 items), 0.901 for leadership competencies (6 items), 0.0923 for social competencies (6 items) and organizational performance is 0.912.

Findings and Discussions

Demographic variables

Below table presents the respondents' profile. Out of 270 respondents 77.4 percent are male and 22.59 are female in which majority 40.7 percent belong to age group of less than 30 years, 36 percent from the age group 30-39 years and rest 23.3 percent are from the age group of above 40 years. Out of all the respondents maximum 37.8 percent of the respondents are belonging to the age group of 6- 10 years followed by 33.9 percent are having the experience of 11 – 16 years. Majority 42.2 percent of the respondents are having the income of 8 lakh – 10 lakh per annuam, above 10 lakh income is by the small portion of 10 percent respondents.

Table 1.1: Respondents' profile

Variables	Frequency(n=270)	Percentage (%)
Gender		
Male	209	77.41
Female	61	22.59
Age		
Less than 30 years	110	40.7
30 to 39 years	97	36
40-49 years	45	16.7
Above 50 years	18	6.6
Experience		
1-5 years	41	15.2
6- 10 years	102	37.8

11-16 years	89	32.9
Above 16 years	38	14.1
Income		
Below 5 lakh p.a	51	19.0
5 lakh – 8 lakh pa	114	42.2
8 lakh – 10 lakh p.a	78	28.8
Above 10 lakh p.a	27	10.0

Source: survey data

Relationship between competencies and organizational performance

The Pearson's correlation analysis is used to determine the correlation between the variables. These findings are shown in Table 4.2. The results demonstrate that every variable is statistically related to every other variable at a significance level of 0.01, demonstrating that all of the variables are positively correlated.

Table 1.2 correlation analysis result

Variables	1	2	3	4
Core competencies	1			
Leadership competencies	.762**	1		
Social competencies	.801**	.721**	1	
Organisational performance	.732**	.714**	.669**	1

**Correlation is significant at the 0.01 level   Source: survey data

Impact of competencies on organization performance

A multiple linear regression analysis was used to test the hypothesis that is to measure the impact of core compeetncies, leadership competencies and social competencies on organisation performance.

Table 1.3 Results of multiple regression analysis

Variables	**Organizational Performance**			**Collinearity Statistic- VIF**
	Unstandardized Coefficient (Beta)	***t*-value**	***p*-value**	
(Constant)	.283	3.253	.001	
Core Competency	.152	2.645	.009	3.071
Leadership Competency	.231	3.889	.007	3.062
Social Competency	.785	8.558	.000	3.042
Adjusted R^2	88.1%			
F-value	988.752	0.000		

Dependent Variable: Organizational Effectiveness

Predictors: (constant), core competency, leadership competency and social competency.

Source: survey data

The above result of multiple regression analysis gives the following multiple regression equation.

$Y = 0.283 + 0.152(X_1) + 0.231\ (X_2) + 0.785\ (X_3)$

Where Y= organisation performance, X_1 core competency, X_2 is leadership competencies and X_3 is professional competencies.

Table 1.3 shows that the regression model fits the data well. The dependent variable and the coefficient of determination are predicted by the model. According to adjusted R2, only the selected variables may account for 88.1 percent of the variation in an organization's performance level, while other factors are responsible for 11.9 percent of the variation. The performance of the company may be statistically predicted by the employees' core competencies, leadership competencies, and social competencies $F\ (3,267) = 988.752$, $p<0.01$. The independent variables Core Competency ($p=0.009$), Leadership competency ($p=0.007$), and Social Competency ($p=0.000$) are all statistically significant at the 1 percent level of significance. It has been noted that the independent variables' slope coefficients are positive. If the core Competency, leadership competency and social Competency of the employees increase by one unit on an average organisation performance would increase by 0.152, .231 and 0.785 respectively keeping other variables constant. Hence among the selected factors all the independent variables have an impact on the organisation performance.

Discussions

The above-mentioned empirical study was done to evaluate how competencies affect organisation performance in petrochemical firms. It has been discovered that the dependent variable, organisation performance, and the three independent variables - core competency, leadership competency, and social competency have a significant positive relationship. The study's findings, which foresaw a positive and strong influence of core competency on organisational success, supported hypothesis H1. The outcome makes it abundantly evident that the employees' core competencies have an impact on the effectiveness of the company. The findings of Lucia & Lepsinger (1999), Parry (1998) are consistent with this outcome of the study. The study's second hypothesis H2, states that the performance of an organisation is favourably and considerably impacted by leadership competencies. The results from Bass and Steidlmeier (1999), Pradhan and Pradhan (2015) have all been confirmed by the current finding. The final hypothesis H3's findings supported the notion that social competencies significantly improve organisational performance, thereby supporting Sucher and Cheung's (2015) suppositions. The three hypotheses (H1, H2, and H3) are therefore accepted.

Implication and Conclusions

The research provided empirical support for the associations between employee competencies and organisational performance, particularly for the petrochemical industries. The relationships between core competencies, leadership competencies, social competencies, and organisational performance were specifically examined. A company that is willing to hire employees with higher levels of core, leadership, and social competencies will probably perform better. This is because employees with higher levels of leadership and social competencies are more likely to develop and sustain strong interpersonal skills, teamwork, communication skills, flexibility, planning, and organisation. Additionally, employees who feel more fulfilled and committed, are more likely to stick around the same organisation for a longer period of time. The study gives policymakers and management in the petrochemical sectors advice on how to encourage the adoption of competency models that are properly created and their implementation in their workplaces in order to improve organisational performance. In order to improve employee competencies, organisations need to professionally plan, develop, and implement well-articulated competency development strategies and procedures. Also, professionally created training programmes for boosting employee abilities should be appropriately implemented while taking into account the employee competencies that the firm will need in the present and the future. Employees should be inspired, supported, and recognised for all of their contributions, and their competencies should be built up, nourished, and utilised for improved organisational performance.

Limitations and future research

The current work acknowledges a few shortcomings that offer important potential for further research. Given that this study only examines a few aspects of employees' competencies, future research may increase the number of variables in the competency model. Future research may also consider additional factors including managerial competencies behavioural competencies, functional competencies, job competencies, and so forth. The results might not apply to other businesses due to the petrochemical industry's particular features. Future studies might focus on different sectors and regions.

Conflict of Interest:

The authors declared no potential conflicts of interest with respect to the research work, authorship and publication of this article.

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