

Telemedicine: Applications, Challenges & Market Analysis

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfilment for the award of the degree of

Master of Business Administration (MBA)

In

Hospital and Health Management

BY

SHRUTI ARJARIA

Under the Supervision and Guidance of

Dr. Kanika Jindal

TELEMEDICINE: APPLICATIONS, CHALLENGES & MARKET
ANALYSIS

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfilment for the award of the degree of

Master of Business Administration (MBA)

In

Hospital and Health Management

BY

SHRUTI ARJARIA

Under the Supervision and Guidance of

Dr. Kanika Jindal

Declaration by Student:

I hereby declare that this dissertation title “Telemedicine: Application, Challenges & Market Analysis” is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Shruti Arjaria

MBA HOM

1206

IIHMR University, Jaipur



Certificate ID : VCE/COC13298

Date : 18 Jun 2022

Certificate of Completion

This certificate is awarded to Miss. Shruti Arjaria from IIHMR University, for successfully completing her online Internship at M/s Vardhan Consulting Engineers as Management Intern during 21 Mar 2022 to 18 Jun 2022.

We appreciate her focus towards learning and analyzing about Marketing Research and completing her Internship project along with the timely submission of report.

We admire Shruti Arjaria's analytical contribution to VCE through her findings on the project : "Detailed marketing plan for an e-learning platform".

During her tenure as Management Intern, we found her efforts sincere, meticulous and result oriented.

We wish all the best in her future endeavors.

Swethana Chilla
Sr. Manager - HR & Internship Coordinator

hr@techvardhan.com, +91 979 111 2715



Certificate URL : <https://certificates.techvardhan.com/COC13298>



Vardhan Consulting Engineers

Management Office : 55/108, Soi 11 Sukhumvit, Bangkok, Thailand, corporate@techvardhan.com, +66 972 151 276
Registered Address : Vardhan House, Anand Bazar, Danapur Cantt, Patna, Bihar, India (<https://techvardhan.com/>)

Acknowledgement:

In this competitive surrounding, there is a race for existence in which those who have the will, to succeed. A Project serves as a link between theoretical and practical aspects of work. With this zeal, I joined Vardhan Consulting Engineers (VCE). I would like to thank my major advisor Mr. Ashish S Kumar, who has always guided me and supported me throughout my period of internship.

I express my sincere acknowledgement to my co-mentor Mrs. Neha Kumari and Ms. Kritika Verma for required cooperation and encouraging me throughout the period.

Thus, I have gained valuable work experience from the organization which will help me in my future career goals.

I'd want to use this chance to express my gratitude to our institute, the Institute of Health Management and Research (IIHMR), Jaipur for providing me with this opportunity to learn and grow.

I'd like to thank my mentor, Dr. Kanika Jindal for her unwavering support and encouragement in helping me complete my project.

Lastly, I want to thank all the people and colleagues for their help and constant support.

Table of Content:

1. Abstract
2. Chapter 1: Introduction
3. Chapter 2: Literature Review
4. Chapter 3: Methodology
5. Chapter 4: Result
6. Chapter 5: Discussion
7. Chapter 6: Conclusion
8. Chapter 7: Recommendation
9. Reference

List Of Figure:

1. Figure 1: Telehealth usage pre covid vs post covid (feb 202)

Abstract:

It has become increasingly important to integrate telemedicine into the global healthcare system in recent years. This effort has the potential to significantly alter medical education and how healthcare is provided.

Telemedicine is the practise of health care providers using information and communication technologies (ICTs) to improve their services. Telemedicine has emerged as the most secure means of communication between patients, both infected and uninfected, and medical professionals during the COVID-19 pandemic due to the need for social seclusion and the lack of viable therapies.

The aim is to investigate the applications and its challenges that influence the use of telemedicine. The study has also thrown light on telemedicine market analysis as well as its future forecast.

The study design used is cross sectional descriptive study where primary and secondary research methodology is used. For primary research, questionnaire is formed, considering population from urban area of Maharashtra. The target respondents considered for my primary research is 120.

The study's overall conclusion demonstrated that telemedicine in the healthcare industry is very helpful, not only because it is simple to use but also because it saves time and money. Telemedicine could potentially replace in-person patient treatment in the near future.

Chapter 1

Introduction

Telemedicine is the practise of receiving medical care while maintaining a social distance through the use of electronic information and communication technology. All you need is an internet-connected phone or device to carry on with your medical care while safeguarding yourself and your healthcare provider from COVID-19. To determine whether telemedicine is a good fit for your medical needs, speak with your doctor.

"Tele" is derived from the Greek word for "distance," and "mederi" is derived from the Latin word for "to heal." Time magazine has nicknamed telemedicine "healing by wire." Formerly considered "futuristic" and "experimental," telemedicine is now a reality and here to stay.

Telemedicine has been utilised in some capacity for more than thirty years, despite the recent spike in interest making it seem like a relatively recent application of telecommunications technology. In the early phases of telemedicine research, the National Aeronautics and Space Administration (NASA) played a significant role. NASA started developing telemedicine in the early 1960s, when astronauts made their first space flight. Physical characteristics were transmitted from the spacecraft and space suits throughout missions.

Telemedicine's use has never looked more important as it does right now. Telemedicine has shown to be crucial in reducing the risk of COVID-19, maintaining our health and that of our family, limiting our contact with medical institutions, other patients, and healthcare workers.

It enables us to communicate with our doctor via phone or video chat and send and receive messages via email or chat messaging. Additionally, it enables for remote patient monitoring and trip time and transportation cost savings. The quantity of clinic visits has decreased as a result of telemedicine.

When screening for specific disorders like covid19 is necessary, telemedicine can be used to provide patient care. It can also be used to provide testing advice and instructions for isolation or quarantine. General healthcare, drug prescription, nutrition counselling, and mental health counselling are all services that can be provided by

telemedicine. However, the telemedicine industry has some difficulties. Telemedicine is not fully understood or accepted by doctors. Patients are uneasy about telemedicine. Due to high technological and network costs, telemedicine can occasionally be unaffordable. In India, over 40% of the population is regarded as being impoverished. Lack of access to transportation, energy, telephones, clean water, primary healthcare, and other essential amenities. Nothing a technology advancement can do can help if a person has nothing to change. In India, just 65.38 percent of the population is literate, and only 2% of those people are proficient in English. E-medicine is still in its infancy and is supported by a variety of software and hardware. For accurate diagnoses and data pacing, improved bandwidth support and advanced biological sensors are needed. Everyone wants quality because it is important, yet this can cause problems. It is entirely up to the organisations to decide how they will manage it because there is no competent regulatory body to make regulations and force organisations to abide by them in the healthcare industry. Like private firms, the government is subject to limitations. Any technology that is still developing needs support and attention. Only the government has the power and resources to help it continue to exist and grow. The government has not made any efforts to further develop it. It doesn't take much imagination to understand that telemedicine will soon be just another way to consult a health expert. Remote monitoring can make every second count by simultaneously gathering clinical data from a number of patients. However, if there is a hardware or software malfunction, information may be lost. Therefore, it could be hazardous to rely too heavily on a computer system to guard against errors in medical data. The utilisation of human intelligence must be balanced with total reliance on computer solutions. Finding that balance might make a difference life and death.

Market Analysis & Insights:

While doing secondary research, telemedicine market growth globally is expected to grow more for the forecast period of 2022-2029 with compound annual growth rate (CAGR) of 7.0%. The major driver for growth in telemedicine market is the growing need of digital healthcare, rising population, the growing prevalence of chronic diseases and conditions, advancements in healthcare infrastructure. Lack of accessibility, regional differences in legislation, fraud, high costs, and the use of social media for delivery might all hinder the growth of the telemedicine industry throughout the projection period.

COVID-19 Impact on Telemedicine Market

Telemedicine market have seen monotonous growth post Covid-19. Lockdowns and isolation during pandemic have increased the market demand to avoid the virus contamination. The major factor that helped in growth is:

1. Increased consumer (patients) willingness to use tele-consultation
2. Increased provider (doctors) willingness to use tele-health
3. Regulatory changes enabling greater access and reimbursement

In comparison to February 2020, the overall utilisation of telehealth for outpatient care and office visits was 78 times greater in April 2020.

Telehealth claims volumes, compared to pre-Covid-19 levels (February 2020 = 1)¹

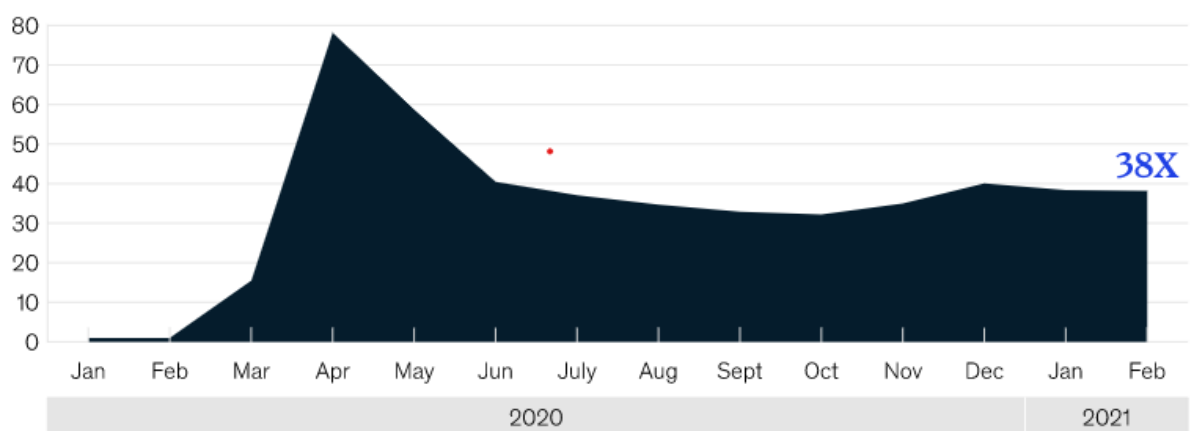


Fig 1- Source: Mckinsey & Company telehealth system & service

Chapter 2

Literature Review:

According to the executive summary of a research paper by Gagandeep Kaur and Dhiraj Sharma published in November 2018 titled **A REVIEW OF THE RESEARCH LITERATURE ON TELEMEDICINE SERVICES**, their low popularity and low success rate are primarily due to lack of awareness, poor infrastructure, and a dearth of Telemedicine centres. Only if the majority of cases are referred to and treated through telemedicine centres will the quality of such services improve, and raising patient awareness in this area will help.

The role of telehealth during COVID-19 outbreak: a systematic review based on recent evidence was published by Elham Monaghesh and Alireza Hajizadeh in 2020 and focused on how telemedicine services have been successful during pandemics. It also mentioned that telehealth should be a key tool in providing care while keeping patients and healthcare professionals safe during COVID-19 outbreak.

According to one of the papers, published in October 2017 by Rajesh V. Acharya and Jasuma J. Rai, **Evaluation of patient and doctor perception toward the use of telemedicine in Apollo Tele Health Services, India**, telemedicine has a number of applications, including critical care monitoring, telemedicine procedures/surgery, robotics, disease surveillance and programme tracking, disaster management, continuing medical education, and public awareness. In India, 90% of secondary and tertiary care facilities are located in cities and towns, distant from the rural areas where 70% of the population resides. India currently has 500 telemedicine nodes spread out over the nation, and many more are planned.

The topic of "**Telemedicine: Current Impact on the Future**" was discussed by a group of authors, including Michael X Jin, Sun Young Kim, Lauren J. Miller, Gauri Behari, and Ricardo Correa, in August 2020. Overall, they claimed that COVID-19's effects have propelled the country's healthcare delivery systems into a new period of development centred on telemedicine. Providers have shown that telemedicine is a practical substitute for visiting every patient in person by rising to the issue of how to provide treatment in a period of social isolation. Rapid technological advancements have the potential to make telemedicine a sustainable method of healthcare delivery, especially for patients who must overcome barriers to accessing care. While telemedicine cannot yet be used universally for all health care needs and cannot fully

replace an in-person physical exam, it can be used to supplement it. The future is virtual, despite the specific difficulties that telemedicine will have to face.

The Centers for Medicare and Medicaid Services have increased access to telemedicine services during the current pandemic, according to one of the papers i.e, **Telemedicine, the current COVID-19 pandemic and the future** written by Asim Kichloo, Michael Albosta, Kirk Dettloff, Farah Wani, Zain El-Amir, Jagmeet Singh, Michael Aljadah, Raja Chandra Chakinala, Ashok Kumar Kanugula, Shantanu Solanki, and Savneek Chugh and published in August 2020. Future benefits of telemedicine include its affordability, capacity to increase access to speciality care, and potential to lessen the impending physician shortage. The drawbacks include the absence of technology resources in some regions of the nation, problems with the confidentiality of patient data, and difficulties with doing the conventional medical examination. In order to completely integrate telemedicine services into the healthcare system and prepare for upcoming pandemics, as well as to benefit from this service in the future, modifications must be done.

Chapter 3

Methodology:

1. Research Question:

- What is the awareness and uses of Telemedicine in urban areas of Maharashtra?
- What are the challenges faced in Telemedicine services?

2. Objective:

- To identify the current status of telemedicine usages in urban areas of Maharashtra.
- To find out the challenges faced and its future forecast.

3. Methodology:

- **Study Design** – Cross sectional descriptive study
- **Setting** –

I will follow primary and secondary research methodology. For the primary research methodology, I will form a questionnaire and will be considering population from urban area of Maharashtra. I will segment the population on the basis of the age. My target age group will be 18-60 years.

- **Sample Size:**

The target respondents considered for my primary research is 130 respondents.

- **Study Population:**

✚ **Inclusion Criteria:** Minimum 12th pass with reading & writing skills of English language, Working professionals, Students, smart phone usage with proper Wi-Fi connection or internet accessibility.

✚ **Exclusion Criteria:** Housewife who are not/just 12th pass, who do not have much knowledge of mobile usage.

✚ **Study Tools:**

A Questionnaire will be formed including various parameter related to telemedicine services. One of the aspects included on the questionnaire's part is the reason for not availing any type of telemedicine services by the population who didn't use any type of telemedicine services. The questionnaire has been developed after the review of literature finding

and then understood and identified the specific issues pertaining to the telemedicine services.

- **Duration of Study:** Study duration was started from 21st March'22 to 18th June'22
- **Sampling Technique:** The questionnaire will be shared with the respondents with their consent and the resulted data will be analysed using MS-Excel.

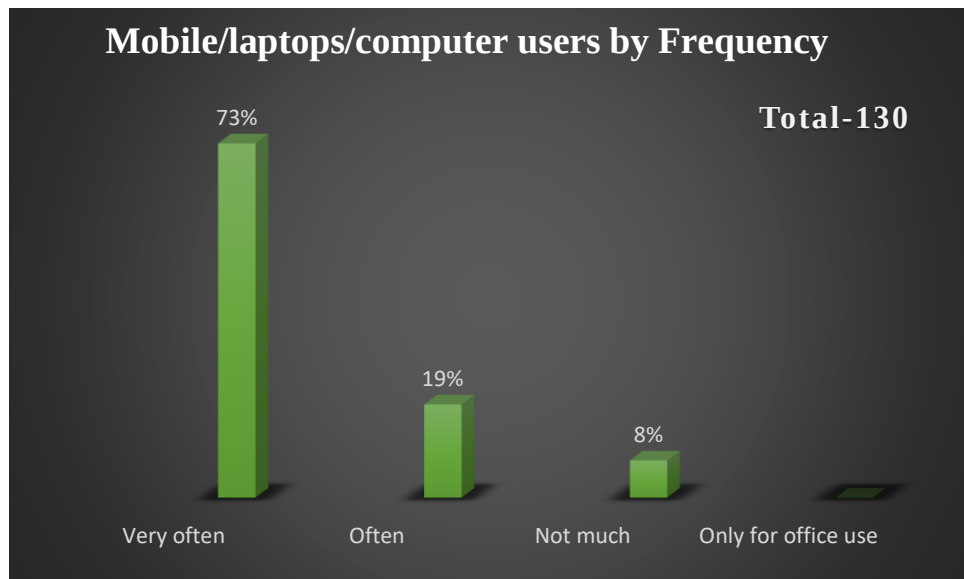
4. **Data Analysis Plan:**

The study is a quantitative and cross-sectional study in nature. The questions were composed of closed ended and open ended, self-administered and developed in English language. The questions will be prepared in regarding with the perception and experience of the participants.

Chapter 4

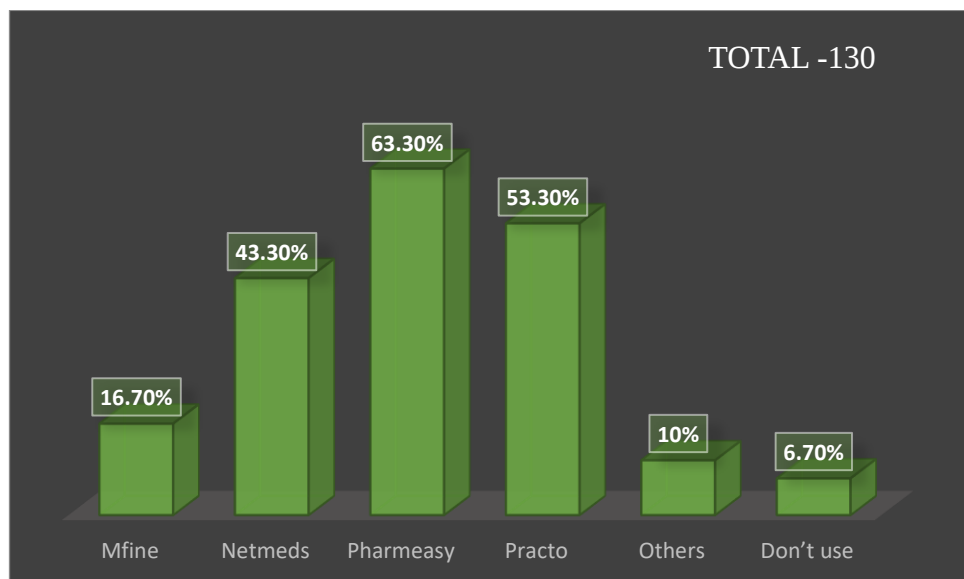
Result:

1. Users of mobile phone/laptop/computer in Maharashtra by frequency of uses.



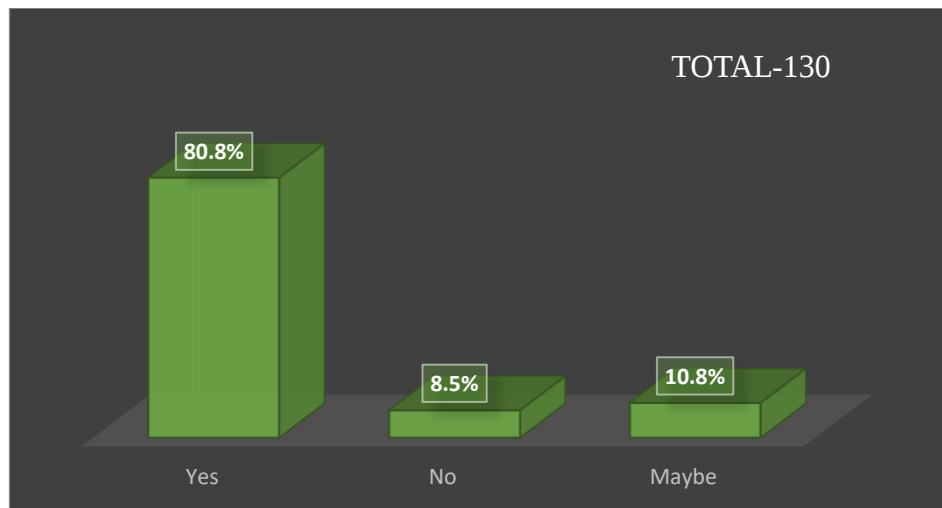
Availing telemedicine services, require access to mobiles/laptop/computers. Nearly 73% uses mobile/laptop/computers very often and 19% uses it often.

2. Usage of different telemedicine apps.



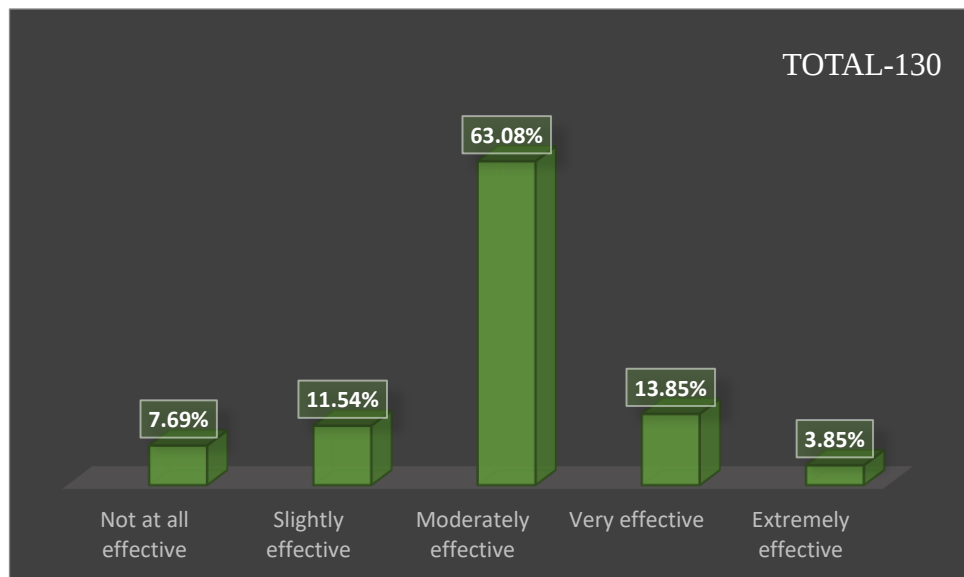
Pharomeasy, Practo & Netmeds are the preferred choice of the apps for availing telemedicine services among the respondents. Nearly 16% also preferred Mfine. However, 10% respondents use other apps services such as Apollo pharmacy, Tata Health app etc.

3. Openness towards receiving health updates from doctors through mobile/computers



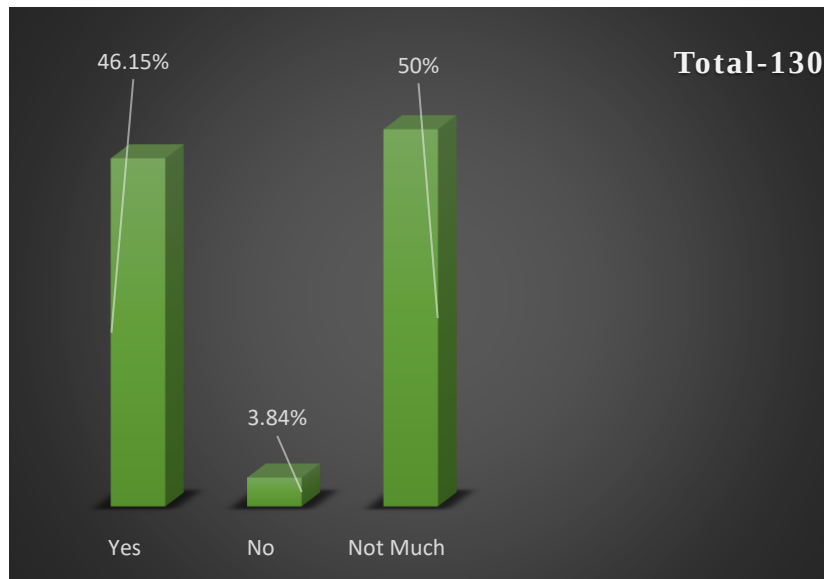
Around 80% of respondents are open to receive their health updates from doctors using mobile/computers.

4. Feasibility of using tele-consultation apps.



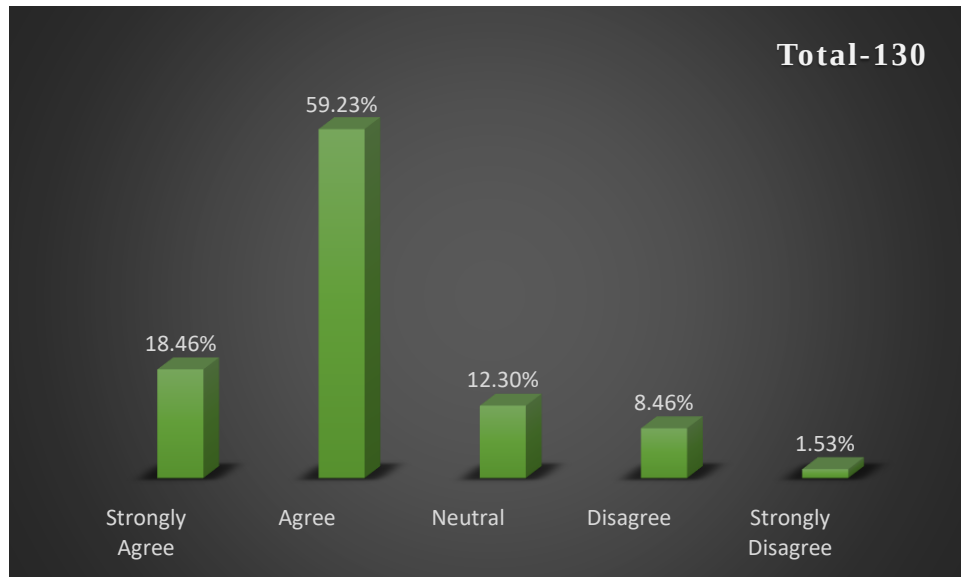
Nearly 80% of respondents find telemedicine apps moderately to extremely effective. While 7.69% respondents do not find it effective at all.

5. Ability to share all health problems in first appointment.



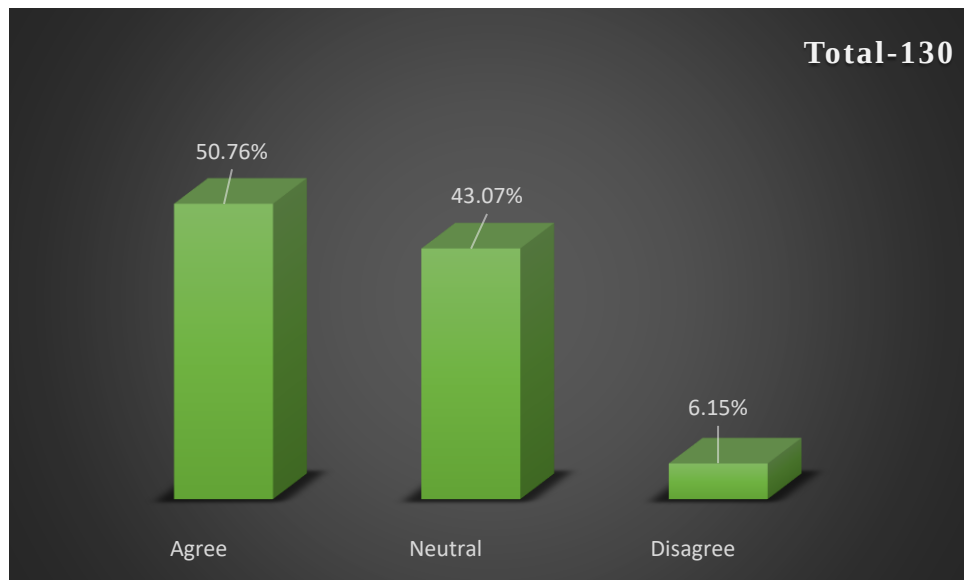
Almost 46% respondents were able to share their all-health problems in first appointment whereas only 3.84% were not able to share their concerns at all. This shows that availing telemedicine services is effective but has scope of improvement as nearly 50% respondents couldn't share all their health problems in one appointment.

6. Viability of telemedicine approach in providing medical care services to patients



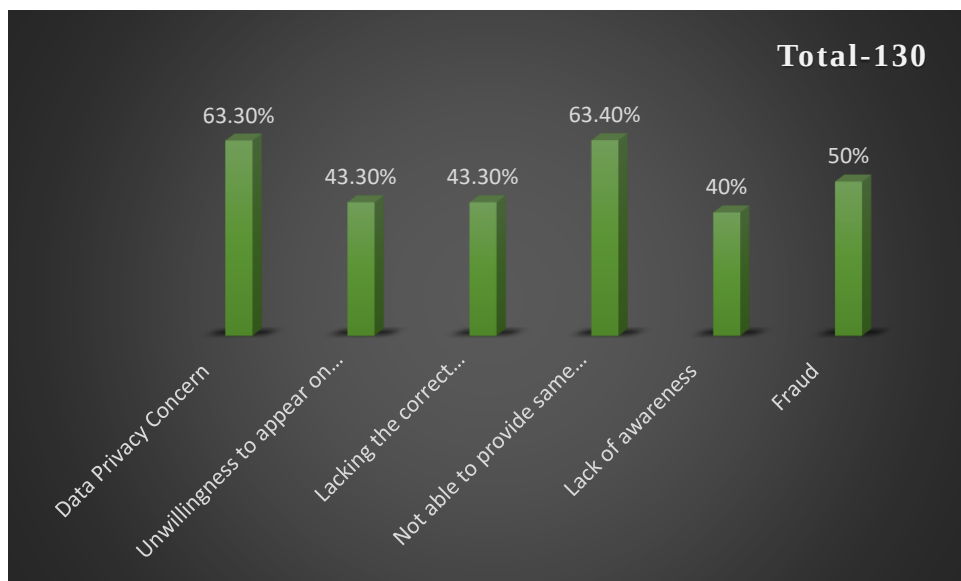
Around 10% respondents do not agree that telemedicine is a viable approach. Another 12% of respondents were also not sure of its viability. Hence, a lot needs to be done to increase the confidence of patients in using telemedicine services.

7. Using of telemedicine service, can save time and money?



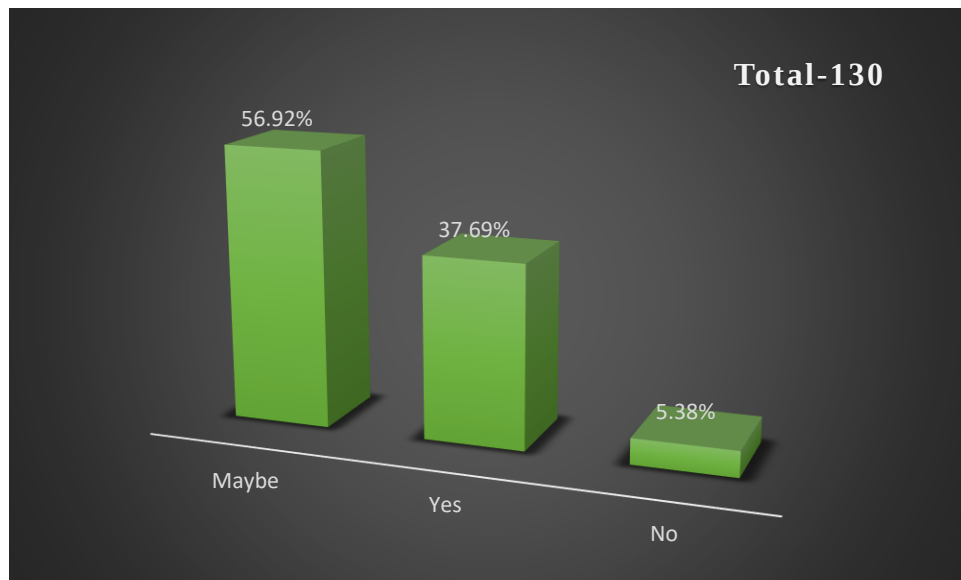
Only 50% agree that telemedicine services save time & money. While 43% are not sure about the contribution of telemedicine services in saving time & money.

8. According to you, what is the reason for reluctance towards Telemedicine?



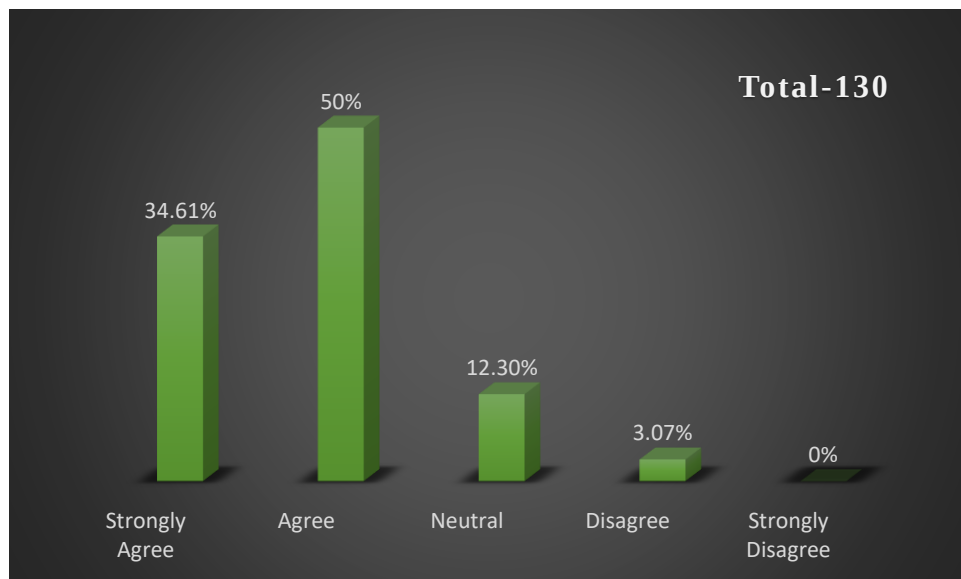
While using telemedicine services data privacy & not being able to provide the same quality of care as in-person consultation emerged as two biggest concerns. Also, Fraud, unwillingness to appear on video & lacking the correct equipment were few other concerns of the respondents. Clearly work needs to be done to mitigate these concerns.

9. Willingness to use Telemedicine in Future



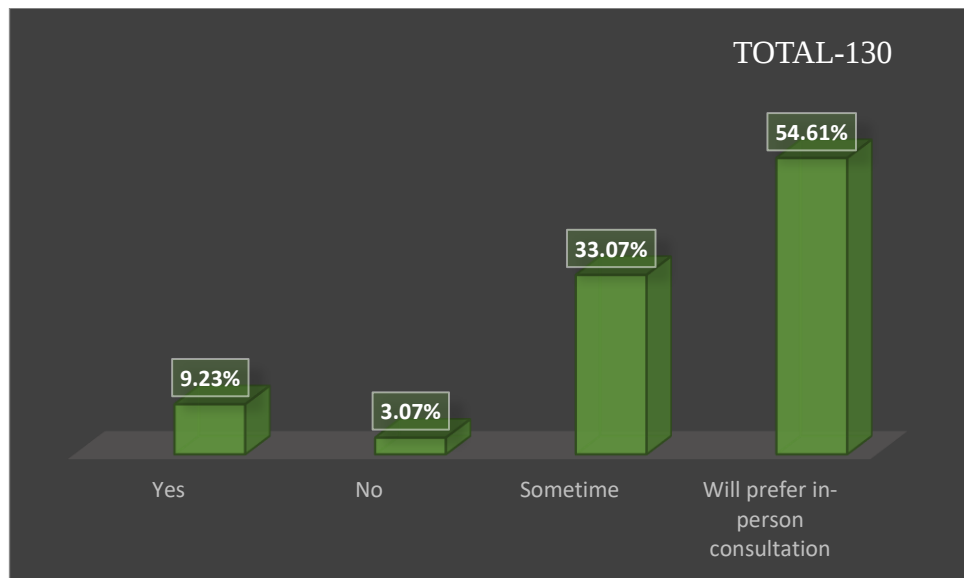
Only 37.69% are willing to use telemedicine in future. While 56.92% are not sure of using telemedicine.

10. Usefulness of Telemedicine in emergency situations such as COVID-19



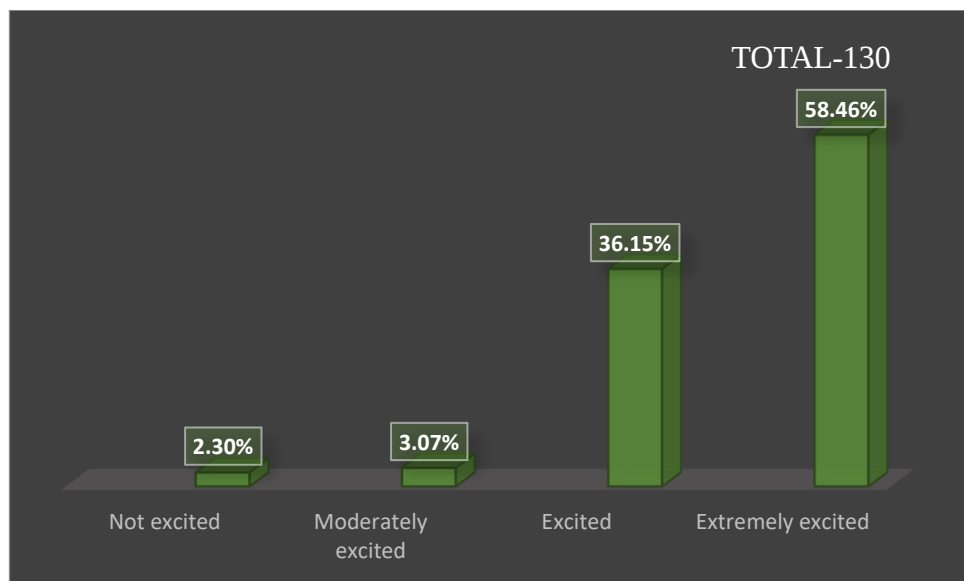
Greater number of respondents agree that telemedicine is useful in emergency situations such as covid pandemic. This gives us the opportunity to reflect upon the factors that make the telemedicine services useful in emergent situations.

11. Willingness to use telemedicine service post covid-19



Nearly 54% of respondent will still prefer in-person consultation over telemedicine services. We need to further explore the decline in usage of telemedicine services post covid-19.

12. Excitement about an emerging concept of Telemedicine



We can clearly see that overall respondents are excited with the concept of telemedicine. However, there is lot changes to be done for the continuous use of telemedicine service.

Chapter 5

Discussion:

Video conferencing, phone calls, texts, emails, and online patient portals are all examples of telemedicine, which is referred to as the "remote delivery of health care services using information and communication technology." Telemedicine can be utilised for mental health, nutrition counselling, prescribing medicines, and general healthcare.

According to the aforementioned finding, there has been a decrease in telemedicine use willingness after COVID-19 as compared to that during COVID-19. Clearly, people feel that face-to-face consultations are superior for conveying concerns, making diagnoses, and managing illnesses.

Fiona Imlach, Eileen McKinlay, Lesley Middleton, and Jonathan Kennedy published a study titled Telehealth consultations in general practise during a pandemic lockdown in December 2020 that gave some information on patient preferences for using telemedicine services during a convalescence. What would be deemed appropriate based merely on the health concern could be overridden by an individual's choice for a particular style of engagement. Some patients insisted on being seen regardless of the issue because they valued touch, examination, and social interaction more than convenience. Others considered the availability of telehealth to be crucial since it could result in time and cost savings. The choices of patients for video or telephone consultations varied widely depending on the situation. Some people found scheduling video appointments to be more stressful and challenging than telephone consultations, which could be done from bed or any other location at the time. Others delighted at the chance to connect online. Patients ultimately desired options that were properly matched to their requirements and interests.

Many responders praised telemedicine's efficiency and convenience as well as the possibility of being "seen" without running the risk of contracting an infection. Telemedicine was not, however, appropriate for everyone or for all conditions. Some people valued direct communication with their doctor more than telemedicine's convenience (with the option of a physical exam if necessary). On several elements of the quality of care, telemedicine was not scored as highly as in-person visits due to worries about not being seen and virtual consultations that appeared hurried or careless.

Despite these variations, the majority of survey participants were open to trying telemedicine in the future, regardless of age or other factors.

Joshua Breslau and Zachary S. Predmore wrote on his readiness to employ telemedicine or in-person consultation in the US in one of the papers, *Assessment of Patient Preferences for Telemedicine in Post-COVID-19 Pandemic Health Care*, published in December 2021. According to their findings, participants typically chose in-person care when given the option of an in-person or a video visit for a non-emergency health concern, and those who were younger, had greater incomes, and had higher educational levels were more likely to choose video visits.

Some people will still like in-person appointments since they make it simpler to provide care for diagnostic testing as well. Even if receiving care in person is more expensive, telemedicine services are unable to deliver high-quality care.

Despite the fact that the COVID-19 epidemic forced many people to use telemedicine services for the first time, its positive outcomes encouraged continued use.

Enhancing telemedicine service delivery is crucial, but being aware of patient preferences will assist determine telemedicine's role in the provision of post-pandemic health care.

Chapter 6

Conclusion:

Telemedicine is the practise of receiving medical care while maintaining a social distance through the use of electronic information and communications technologies. Accessing telemedicine services require access to laptops/computers and internet as well. According to my research, nearly 92% people use laptops often which suggests that the basic infrastructure requirement for the telemedicine services already exists in the market and can be exploited to increase the consumers of telemedicine. Application of telemedicine has never seemed so significant as today. Telemedicine has shown to be crucial in lowering the risk of COVID-19, maintaining our health, and reducing the direct contact we have with hospitals, other patients, and medical personnel. It can also be used to provide testing advice and instructions for isolation or quarantine.

Telemedicine has also proved to be effective in saving time and money for nearly 50% of the respondents and there is an opportunity to extend these benefits to nearly 43% more population. Practo, NetMeds and Pharomeasy are some of the preferred choices for availing telemedicine services. However, there are certain challenges in availing telemedicine services such as data and security concerns of users, disparity in the quality of consultation between in-person and over telemedicine apps, fraud and lack of awareness. Telemedicine service providers need to work upon eliminating the disparity in experiences of in-person consultation and consultation over telemedicine platforms.

Chapter 7

Recommendation:

1. Government and telemedicine providers need to collaborate and make regulations to increase data security of telemedicine users.
2. Awareness should be increased about the benefits of using telemedicine services through Ads and campaigns
3. Telemedicine providers need to work towards eliminating the disparity in consultation experience between in person and over telemedicine platforms. Features such as post consultation chats can be launched where users can ask questions that they could not ask during consultation.
4. Health record of the users can be maintained, regularly updated and shared with different providers on telemedicine platforms after approval from users. This will help to gain confidence of users and at the same time improve the ease of usages as the users will no longer be required to share the same information repeatedly.

References:

1. Recentscientific.com. 2022 [cited 1 July 2022]. Available from: <https://recentscientific.com/sites/default/files/10122-A-2018.pdf>
2. Monaghesh E, Hajizadeh A. The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. 2022.
3. Kichloo A, Albosta M, Dettloff K, Wani F, El-Amir Z, Singh J et al. Telemedicine, the current COVID-19 pandemic and the future: a narrative review and perspectives moving forward in the USA. 2022.
4. Jin, M. X., Kim, S. Y., Miller, L. J., Behari, G., & Correa, R. (2020). Telemedicine: Current Impact on the Future. *Cureus*, 12(8), e9891. <https://doi.org/10.7759/cureus.9891>
5. Available from: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle>
6. Available from: <https://bmcprimcare.biomedcentral.com/articles/10.1186/s12875-020-01336-1#Sec10>
7. Gordon H, Solanki P, Bokhour B, Gopal R. “I’m Not Feeling Like I’m Part of the Conversation” Patients’ Perspectives on Communicating in Clinical Video Telehealth Visits. 2022.
8. WHO? Q&A on coronaviruses (COVID-19). Available from: <https://www.who.int/news-room/q-a-detail/q-a-coronaviruses>. 2020.
9. van der Hoek L, Pyrc K, Jebbink MF, Vermeulen-Oost W, Berkhout RJ, Wolthers KC, et al. Identification of a new human coronavirus. *Nat Med* 2004;10(4):368–373. <https://doi.org/10.1038/nm1024>.
10. Lipsitch M, Swerdlow DL, Finelli L. Defining the epidemiology of Covid-19—studies needed. *N Engl J Med* 2020. <https://doi.org/10.1056/NEJMp2002125>.
11. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China the Lancet 2020; 395(10223):497–506. [https://doi.org/10.1016/S0140-6736\(20\)30183-5](https://doi.org/10.1016/S0140-6736(20)30183-5).
12. Jiang F, Deng L, Zhang L, Cai Y, Cheung CW, Xia Z. Review of the clinical characteristics of coronavirus disease 2019 (COVID-19). *J Gen Intern Med* 2020;1–5. <https://doi.org/10.1007/s11606-020-05762-w>.

13. Telemedicine | Medicaid [Internet]. Medicaid.gov. 2022 [cited 1 July 2022]. Available from:
<https://www.medicaid.gov/medicaid/benefits/telemedicine/index.html>
14. Telemedicine: a primer. Curr Allergy Asthma Rep 2018;
18:54. doi:10.1007/s11882-018-0808-4pmid:
<http://www.ncbi.nlm.nih.gov/pubmed/30145709>
15. Covid-19 and health care's digital revolution. N Engl J Med 2020;**382**:
e82.doi:10.1056/NEJMp2005835pmid:
<http://www.ncbi.nlm.nih.gov/pubmed/32240581>
16. Evolutions in Telemedicine: From Smoke Signals to Mobile Health Solutions [Internet]. Taylor & Francis. 2022 [cited 1 July 2022]. Available from:
<https://www.tandfonline.com/doi/full/10.1080/15323269.2016.1150750>
17. KM Z. Telemedicine: history, applications, and impact on librarianship [Internet]. PubMed. 2022 [cited 1 July 2022]. Available from:
<https://pubmed.ncbi.nlm.nih.gov/8938332/>