

“Telemedicine and its acceptance by the general population of Vidarbha region (Chandrapur District) in (Maharashtra)”

1. Dr Jagadeesha M

Assistant Professor Sr-Symbiosis Institute of Health Sciences

jaggisun@gmail.com

2. Dr Pramod Kumar Mishra

Associate Professor

Symbiosis Institute of Health Sciences

pramod_neeta@yahoo.co.in

Abstract

Purpose: This paper endeavours to accommodate an investigation to rule out the factors influencing the acceptance of telemedicine services among the ultimate population (excluding the medical professionals) of Vidarbha within the Maharashtra state.

Design/Methodology/Approach: This paper adopts the empirical as well as conceptual study method to analyse behavioural patterns, thoughts, hurdles and level of adaptability to the telemedicine technology. The initial data has come from 151 people of Vidarbha through a questionnaire based survey and additionally some recommendations for engaging people with telemedicine technology were suggested. A few articles were considered for the review, discussion and analysis.

Findings: The findings regarding factors including privacy, trust, facilitating conditions and resistance to vary can aid within the planning and adequate provision of telemedicine services in India. Implications of these findings for healthcare leaders shall be briefly considered in future.

Research limitations/Implications: The paper does not focus on the aspect of healthcare workers of the telemedicine. The study is completely general population oriented who are going to use telemedicine to consult a doctor. Study is only focussing on the Indian telemedicine market. Does not include the orthodox telemedicine usage techniques. It is a generalised study with does not focus on a specific branch of healthcare speciality in telemedicine.

Originality/Value: With respect to a research article on acceptance of telemedicine additional factors were suggested in the questionnaire such as Willingness to pay and Language barriers.

Keywords: Telemedicine, technology, acceptance level, resistance, anxiety, privacy.

1. Introduction

Recent evidence suggests that over the past few years, information and communication technologies (ICT) have brought tremendous changes to the long-established environment of healthcare services. Research studies have shown that telemedicine is gradually becoming the prominent service of ICT with exceptional effects on the long-established mechanisms of health care services. Now the Indian government has published Telemedicine practice guidelines on March 25th, 2020. These guidelines finally clarify India's position on the legality of telemedicine. It is now perfectly legal to provide telemedicine by registered medical practitioners (M.B.B.S and above) in line with the needs of the telemedicine guidelines around the globe, telemedicine services are enhancing the effectiveness of physicians, reducing medical costs and ameliorating the access to health care services.

Telemedicine services allow health-care professionals to monitor, diagnose and offer treatment at great distances using telecommunication technologies today. Research studies have also advocated telemedicine services as a promising solution to enhance several chronic medical conditions including hypertension, obesity, diabetes, depression, and cancer etc. But as telemedicine was a bystander it is important to know the level of acceptance from its users. India ranks as the 2nd most populated country in the world. Healthcare system in a few areas of India is usually marred by lack of access to basic primary health services. Despite in some notable improvements in certain healthcare areas over the last decades healthcare in a few areas continues to be dominated by a high escalation in population growth, maternal mortality rates and increasing load of chronic diseases. People living in rural areas have to spend a huge amount of money on traveling and bear considerably large expenditures for various medical treatments. Nonetheless, the recent remarkable growth in modern information and communication technology (ICT) and potential of telemedicine services has paved new ways for reaching out to the rural population of India for improving its access to health care services. Telemedicine services represent a commitment in near future for addressing the critical lack of access to manage several health-related issues. Despite its acknowledged benefits, telemedicine can be a useful health service only when people will begin to utilize it. Therefore, the common attitude of end-users towards acceptance of telemedicine services will play a significant role. To foster the adoption of telemedicine services among people, it is initially very vital role to analyse the factors influencing their perception. The project is focused on investigating the key facilitators and inhibitors of telemedicine services in the perspective of people living in Vidarbha region of Maharashtra state by using a questionnaire-based survey.

Literature review:

Saxena, J. Singh (2003) "Telemedicine isn't an evolutionary concept but a revolutionary concept in itself. It is considered as an innovative approach in providing quality of health care whenever and wherever needed, but is seen lacking reliability, user friendliness & most importantly trust. In fact the main challenge facing website administrators, software engineers, system developers & medical practitioners is to develop strategies that will give telemedicine a reliable environment to exploit opportunities and make it more feasible & cost effective. The current synergy between health reform initiatives (which are defining how health care services are acquired and delivered) and the benefits in technologies (that support telemedicine projects) has resulted in proliferation of telemedicine projects. The current scenario demands that the development of telemedicine strategy is to be based on a sound knowledge, awareness of the present and future potential of telemedicine to improve care quality, while reducing the cost in health services".

"Problems and Obstacles :Perspective of Doctors : Doctors are not completely convinced with telemedicine. They are worried how their jobs will be performed more effectively and efficiently through the use of telemedicine. The very thought of diagnosing a patient when he/she is physically absent just on basis of the data provided through the net turns them blue and resistant. **Patients fear & unfamiliarity towards technology :** There is a lack of confidence in patients, about the results of telemedicine. The main issue is that any treatment consist of two factors; first is chemotherapy i.e. treatment by medicines and the other is psychotherapy that means treatment by emotions which is completely missing in telemedicine. **Lack of facilities:** In our country, nearly 40% of population is below the poverty line. Basic facilities like transportation, electricity, internet, safe supply of water, primary health services, etc. are missing. **Literacy & diversity in our languages :** Only 65.38 % of India's population is literate among which only 2% is well-versed in English language. Also, the presence of a large

number of regional languages makes the applicability of the technology makes it difficult for the whole country to accept it. Technical difficulties : Telemedicine supported by various sorts of software and hardware, still must mature. For correct diagnosis, we require advanced biological sensors and good connectivity”Saxena, J. Singh(2003).

(Kamal, Shafiq,&Kakria, p. 3, 2020) “Despite the acknowledged potential of information technology (IT) in health care systems for improving the quality of medical care and safety of patients, sometimes the It based systems find resistance from people for using it or fail altogether. People have a general tendency to show resistance towards any new technology whenever it is implemented based on their pre-conceived evaluation of change. Resistance may alter the decision of a user to adopt or discard a new any technology, hence, the failure and problems of many IT-based health systems can be tracked to know user’s resistance because of the inclusion of hard influence tactics . In most of the health informatics based ventures, resistance is neglected because of its probable effects on the sustainability, reliability. Also, the primary purpose of designing a new system is to make it user friendly and not to minimize the consideration of resistance from the perspective of the user. Hence, the probable effects of resistance are often overlooked in IT-based health care system. According to early research studies on organizational resistance, some researchers deem it as a change which is the direct product of unfreezing the equilibrium of the established dynamics of the system before the change can impart any significant contribution. In the context of information and communication technologies, resistance is generally defined as the social inertia towards a change which is possibly brought by the new technology”.

2. Research Objective

1. To investigate and rule out the factors influencing the acceptance of telemedicine services among the ultimate general population (excluding the medical professionals) of Vidarbha within the Maharashtra state.
2. To study the behavioural patterns in the people regarding telemedicine usage.
3. To determine the challenges, hurdles influencing the usage intension of telemedicine.

3. Research Methodology

This paper adopts the empirical as well as conceptual study method to analyse behavioural patterns, thoughts, hurdles and level of adaptability to the telemedicine technology. Out of 200 distributed questionnaires, 151 were selected for data analysis and the rest were discarded as they were incomplete. In the end of the survey people were also asked about describing the major barriers that might resist telemedicine usage and they responded with concerns like- Trust, connectivity, confidentiality, language barriers, physical presence of the doctor, technology anxiety etc. Additionally, some recommendations for engaging people with telemedicine technology were suggested. A few articles were considered for the review, discussion and analysis. Quantitative and comparative approach was used for data analysis. Comparison with excel was performed amongst them to present the noteworthy outcomes.

4. Discussion, Analysis & Findings

- **Technology awareness among people of Vidarbha:** Telemedicine usage immensely increased during COVID-19 pandemic but there are a few challenges

that remain for its widespread adoption among the general population. Analysis shows that lack of awareness among the population of Vidarbha can be one of the challenge for adoption of telemedicine. About majority i.e. 45.3% people were aware but 52.0% of people didn't know about telemedicine yet, and 2.7% of people were confused and had no clarity about this technology. There is still plenty of room to drum up awareness of telemedicine and figure out the right approach. People are in a dilemma due to lack of computer knowledge as well as insufficient knowledge about telemedicine. Lack of awareness is may be because people have different mindset before availing any treatment i.e. they have always preferred to visit the hospital whenever they getsick.

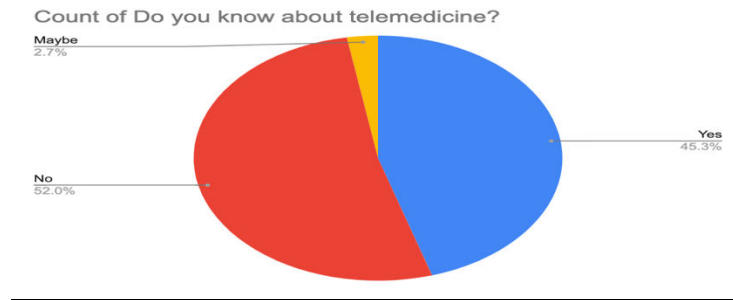


Figure 1.

- Trust:** Trust has been broadly regarded as an important determinant in the evaluation for the acceptance of telemedicine technology. This also grip for telemedicine services where trust is considered as an equally important factor of end user's acceptance. Due to its central role in facilitating various social interactions among members of society, trust becomes an integral part for maintaining successful inter-personal relations. In the context of online healthcare services, trust has been defined in many ways; various authors consider it to be one dimensional while others perceive it as two dimensional. Within the context of this project, we perceive trust as faith in the adoption of a new technology that end-users/patients place in it with regards to the services this technology can provide. Based on that, for the current study, it is recommended that the perception of users regarding placing their trust in the technological infrastructure and procedural guarantees should also enhance their intention to use telemedicine. People are hesitant to use the technology because it is all virtual and they believe they might miss the physical touch by their doctor and fail to convey their message properly, and hence a wrong diagnosis can take place.

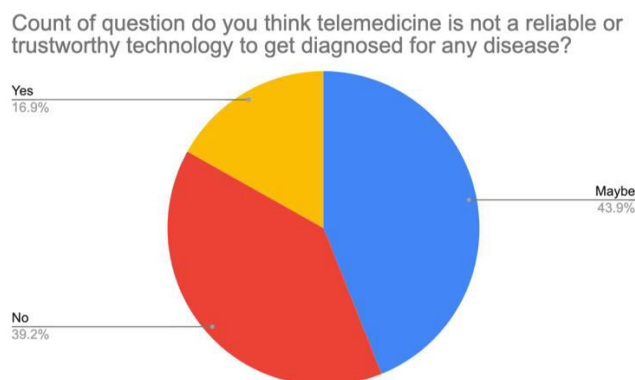


Figure 2.

- Technology anxiety:** With the advancement in science and technology, it becomes critical to find out and understand the willingness of users to adopt new technologies. Technological anxiety is the fear that people experience when they begin to consider using a new computer-based technology they have not used before. Technological anxiety is a negative emotional response and a negative relationship exists between using any new system. Similarly, in the context of this article, people might feel anxious to avail these service. Especially, a few elderly people who are not familiar to computers or mobiles. They find it as a jargon and have lack of clarity in, instructions and backing. They might also be sceptical for utilizing the telemedicine service because they lack confidence, they find technology complex and it frightens them to use such fancy things. “Knowing elderly group’s perceptions about telemedicine is also important to assist with introducing it to the population and increase the potential of technology to provide them independent living” (Vaportzis, Clausen and Gow 2017).

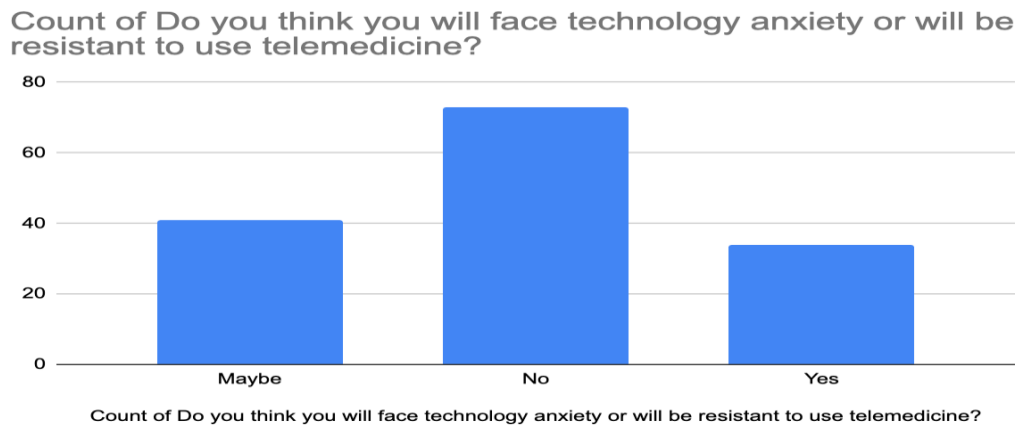


Figure 3.

- Privacy:** Reviewing the definition of information privacy, it can be interpreted as the lack of control a person experiences about his/her personal information once they have adapted themselves to any new system. Privacy can be perceived as the sense of establishing a user’s faith into a system or a technology such that he/she will feel safe enough to share personal health information. The importance of privacy, when it comes to exchanging health information within the system, can’t be denied. Previous studies have acknowledged the importance of privacy as an important factor for technology acceptance. “The Health Insurance Portability and Accountability Act of 1996 (HIPAA) looks after privacy standards”. According to Shuren and Livsey (2001), “The Privacy Rule limits the utilization and disclosure of PHI to purposes of treatment, payment, or routine health care operations. It requires covered entities to provide advance notice to the public of its policy governing disclosure of PHI. Requires entities covered by the Standard to secure general client consent to use or to disclose personal health information for any treatment, payment, or routine health care operations and to obtain specific client authorization to use or to disclose PHI for all other purposes unless the disclosure is specifically permitted without consent or authorization”.

Users are not aware about this act. It should be advised to the users to make sure that they follow all the provider’s instructions and take all the security steps mentioned in

the telemedicine applications. If a user believes his/her information is not being kept safe in the system, it will reduce the acceptance of that technological initiatives. Similarly, in the context of this article, privacy concerns are shown to reduce the usage intention for the adoption telemedicine technology. Hence, users with high privacy concerns and security threats regarding the exchange of information within a telemedicine system might become hesitant to adopt it. Without sufficient security and privacy for underlying telemedicine, users might lack trust for its use.

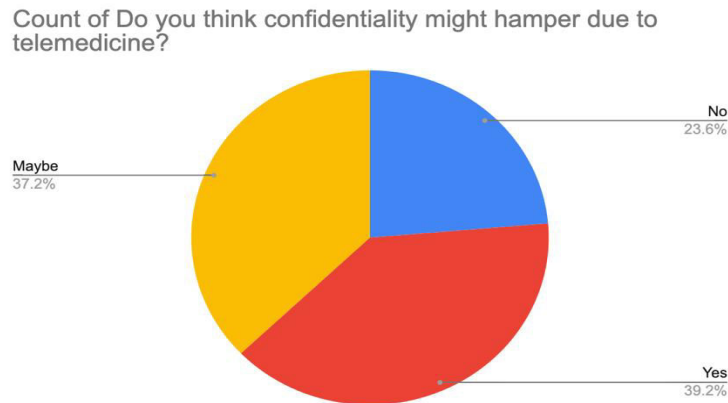


Figure 4.

- Facilitating conditions and connectivity:** Another factor with respect to of behavioural intention to accept telemedicine is facilitating conditions and connectivity. Facilitating conditions is defined as the existence of adequate technical infrastructure for a user’s support to adopt the technology. The successful usage of telemedicine services is significantly dependent upon the presence of adequate technological infrastructure. Moreover, the usage of telemedicine services also requires a continuous connectivity between health care professionals, service providers, and end-users, located in distant areas. Internet availability at a speed that allows good quality transmission of video can make telemedicine service efficient. We still have issues with normal calls and if the video quality is not good enough to examine (say an infection on skin/ injury). Not all the users have smart devices and good band width to connect to their doctor. So having an appropriate device and connectivity can only make the usage of telemedicine more effective and efficient.

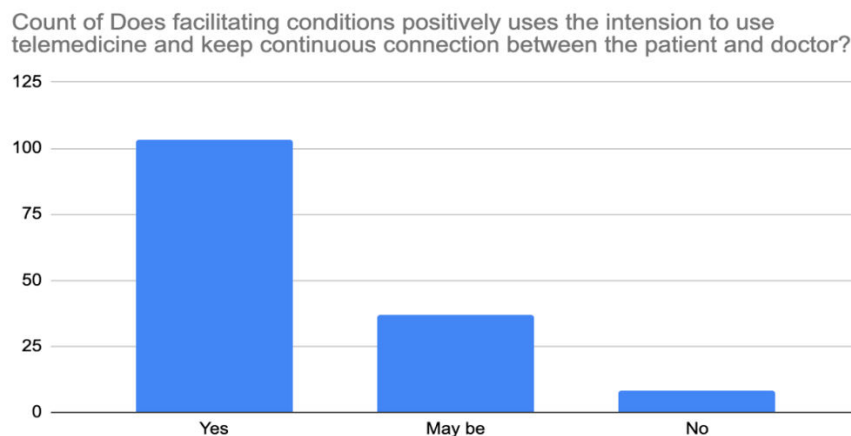


Figure 5.

- Language barriers:** Language could be one of the factor in acceptance of telemedicine usage. There are people who might not understand the directions given in the technology due to lack of knowledge with respect to language that is been used. A few telemedicine portals have only 1 language which limits the usage of telemedicine and makes it difficult to understand the instructions given for the users. There can be possibilities that people may get anxious if the technology is only limited to English. Telemedicine has been a vital lifeline but it needs to be able to serve everyone- involving people with little or no English skills.

Count of Do you think local language barriers to your geological region could be a problem?

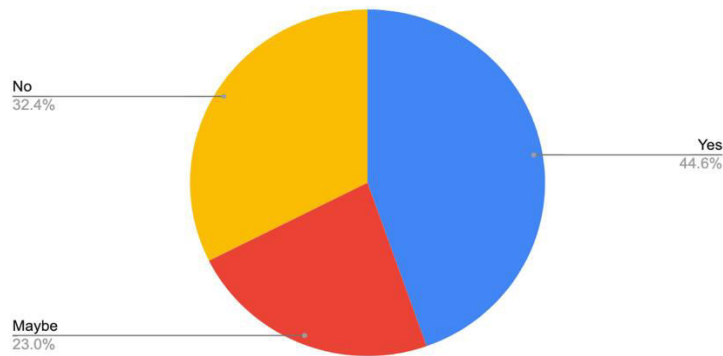


Figure 6.

- Willingness to pay:** According to Ifeyinwa and Obinna (2017), “WTP is the maximum amount that a person is convinced to spend in order to acquire benefits and satisfaction from any good or service”. To understand and evaluate the acceptance of telemedicine it was important to know whether people wish to pay for this technology. The survey depicts that due to low -level of awareness among some people may lead to less willingness to pay for the service. Some people will be unable to afford for telemedicine and may need government support. Also, a few people believed to spend their money in hospitals, clinics by physically being present and availing the treatment because spending for telemedicine can be risky. Maximum people according to the survey were hesitant to pay for telemedicine.

Count of Are you worried about spending your money in telemedicine?

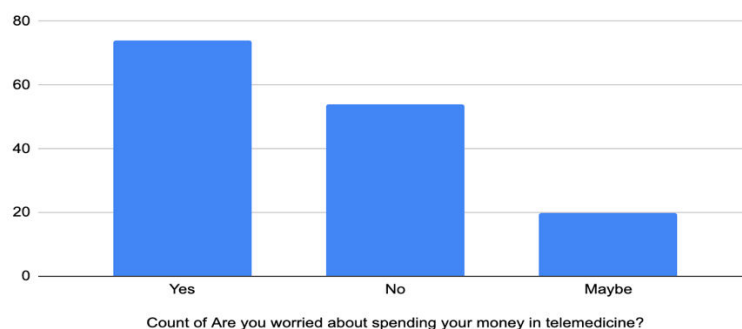


Figure 7.

- Resistance to use:** According to the results of survey resistance towards technology decreases the intention of users to utilize telemedicine technology. The inclusion or introduction of a new technological system usually endangers the established working

setting of the users. In extreme conditions where users are compelled to utilize telemedicine services in absence of any alternative to accomplish the health-related task or in situations like COVID-19 users will give a thought to use telemedicine or they may start using the system voluntarily, however, they will stop using it after some time or once the situation is normal. Contributing to the resistance of users towards telemedicine, another factor could be the prior experience of a user with telemedicine. If the prior usage of the system has left the user uncomfortable or it has failed to provide the necessary information, and the user did not get satisfactory results they will not tend to use it again. Also, users have a mind-set to go to doctors when they are sick so diverting their mind to treat themselves via sending information through technology is a huge task.

- A few additional questions were also asked in the survey to know people’s adjustability and adaptiveness towards and technology, their thought towards conveying health information to the doctors and preference towards using it to save time, money and travelling cost in the hospitals. Following is the analysis of their responses :

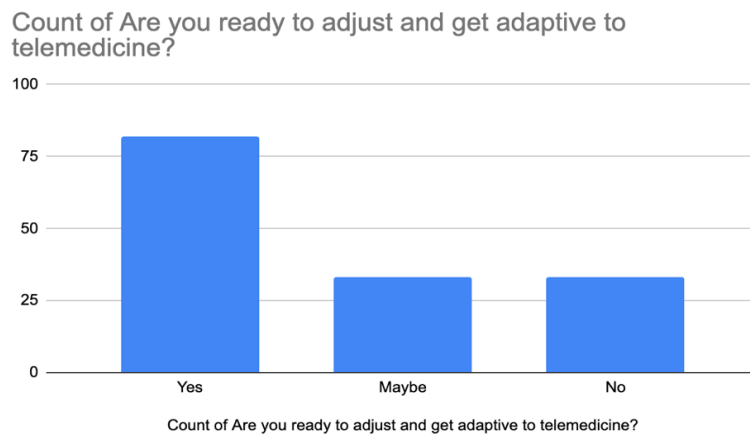


Figure 8.

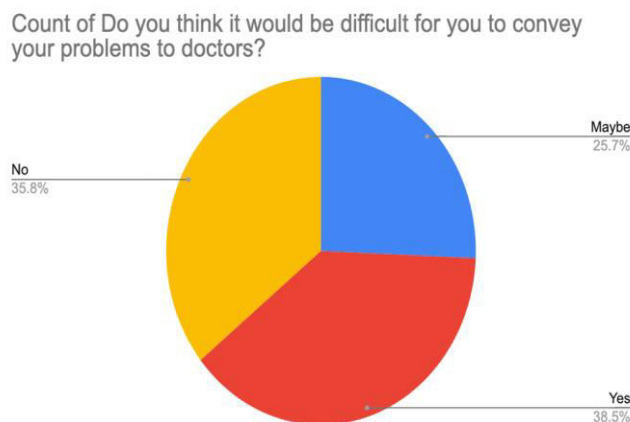


Figure 9.

Count of People who will prefer to use telemedicine in future to avoid long waiting times in the hospital, save travelling cost and time?

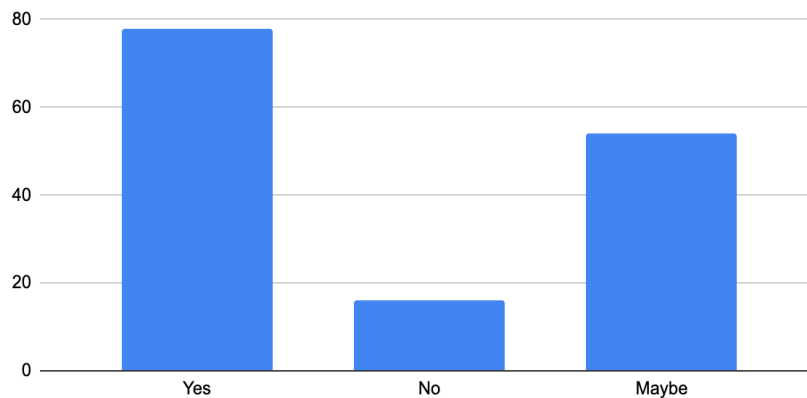


Figure 10.

5.Results

The study has produced reviews about various level on acceptance of telemedicine amongst general population of Vidarbha within the state of Maharashtra. The study has focused on implementing techniques through which telemedicine can be easier to access by patients, people who are new to use it, to make it more convenient for them to work with through knowing their willingness to accept telemedicine technology. Different organisations have now implemented telemedicine but it is important to know the level of comfort and satisfaction people have while using it. There will be great advantages that general population would attain by availing telemedicine. The role of this study was to put light on the problems that are faced by the general population in getting accustomed to telemedicine practices. Also, to suggest with a few recommendations for its better and maximum usage.

6.Recommendations

- 1) Awareness regarding technology among the population through social media, hospital websites.
- 2) Creating awareness about HIPAA regarding patient's sensitive health information..
- 3) Promote home based care to the patients visiting the hospitals for minor ailments and explaining them the benefits of the same.

7.Limitations

The study does not focus on the aspect of healthcare workers of the telemedicine. The study is completely general population oriented who are going to use telemedicine to consult a doctor. Study is only focussing on the Indian telemedicine market. It is a generalised study which does not focus on any specific branch of healthcare speciality in telemedicine.

8.Conclusion

Telemedicine in Vidarbha region has a great potential to serve in healthcare system. Telemedicine services can serve as an integral building block. The project investigated factors influencing the acceptance of telemedicine service. This project explored the barriers influencing the willingness of patients to utilize telemedicine services. The findings of the survey highlight that facilitating conditions, and trust, privacy, technological resistance are main factors influencing the acceptance of telemedicine services. Technological anxiety was not

that significant factor as most of the people use smart devices now among the population. It was identified that trust is an essential determinant for acceptance of telemedicine. Thus a higher level of trust in telemedicine systems can significantly enhance the usage intention of patients. It is also suggested that due to lack of awareness of telemedicine in many communities of the country, It would be really helpful, if we create an awareness of this technology with proper marketing, including a few success stories. With respect to privacy we will have to create awareness regarding HIPPA. After all it is for the health of people's lives. We need to achieve confidence of patients/ people and serve them with efficacy.

Based on the identified factors including facilitating conditions, technological anxiety, privacy etc. telemedicine service providers, planners, and policy- makers can design better strategies for the successful implementation and adoption of these services in this area. Because of the empirical approach of this study, the finding from the survey can be easily applied to the health care settings of many areas.

9. References

1. ("Acceptability and willingness to pay for telemedicine services in Enugu state, southeast Nigeria - Ifeyinwa Arize, Obinna Onwujekwe, 2017", 2020)
2. (2020). Retrieved 2 October 2020, from https://www.researchgate.net/publication/311439328_TELEMEDICINE_IN_A_TERTIARY_CARE_HOSPITAL_IN_SOUTH_INDIA_-_A_THIRTEEN_YEAR_REVIEW.
3. 8/2017 Repertoire | Satisfaction and Convenience to Drive Televisit Growth. Hida.org. (2020). Retrieved 8 August 2020, from <https://www.hida.org/distribution/news/hida-in-news/Satisfaction-Convenience-Drive-Televisit-Growth.aspx>.
4. Advt. No. NESAC/RMT-R/01/2019 Result for Recruitment of 03 posts Scientist-SC and Written Test for 02 posts of Technical Assistants – North Eastern Space Applications Centre. Nesac.gov.in. (2020). Retrieved 2 October 2020, from <https://nesac.gov.in/career/recruitment-for-scientist-sc-and-technical-assistants/>.
5. Breen, G., & Matusitz, J. (2009). An Evolutionary Examination of Telemedicine: A Health and Computer-Mediated Communication Perspective. *Social Work In Public Health*, 25(1), 59-71. <https://doi.org/10.1080/19371910902911206>
6. Chellaiyan, V., Nirupama, A., & Taneja, N. (2019). Telemedicine in India: Where do we stand?. *Journal Of Family Medicine And Primary Care*, 8(6), 1872. https://doi.org/10.4103/jfmpc.jfmpc_264_19
7. Cranford, L. (2020). Practical Applications of Modern Telemedicine | Chiron Health. Chiron Health. Retrieved 8 August 2020, from <https://chironhealth.com/blog/practical-applications-modern-telemedicine/>.
8. Dasgupta, A., & Deb, S. (2008). Telemedicine: A new horizon in public health in India. *Indian Journal Of Community Medicine*, 33(1), 3. <https://doi.org/10.4103/0970-0218.39234>
9. For Telehealth To Succeed, Privacy And Security Risks Must Be Identified And Addressed | Health Affairs. Healthaffairs.org. (2020). Retrieved 8 August 2020, from <https://www.healthaffairs.org/doi/full/10.1377/hlthaff.2013.0997>.
10. Garshnek, V., & Burkle, F. (1999). Applications of Telemedicine and Telecommunications to Disaster Medicine: Historical and Future

- Perspectives. *Journal Of The American Medical Informatics Association*, 6(1), 26-37. <https://doi.org/10.1136/jamia.1999.0060026>
11. Harst, L., Lantzsch, H., & Scheibe, M. (2019). Theories Predicting End-User Acceptance of Telemedicine Use: Systematic Review. *Journal Of Medical Internet Research*, 21(5), e13117. <https://doi.org/10.2196/13117>
 12. Health Insurance Portability and Accountability Act of 1996 (HIPAA) | CDC. Cdc.gov. (2020). Retrieved 30 October 2020, from <https://www.cdc.gov/phlp/publications/topic/hipaa.html>.
 13. ISRO - Telemedicine Manual. V2020resource.org. (2020). Retrieved 2 October 2020, from http://v2020resource.org/content/files/remote_rural_population.htm.
 14. Jagannath Prakash Singh ©, G. (2020). Themanager.org. Retrieved 1 October 2020, from <https://www.themanager.org/Resources/Telemed.pdf>.
 15. Jansen-Kosterink, S., Dekker-van Weering, M., & van Velsen, L. (2019). Patient acceptance of a telemedicine service for rehabilitation care: A focus group study. *International Journal Of Medical Informatics*, 125, 22-29. <https://doi.org/10.1016/j.ijmedinf.2019.01.011>
 16. Kamal, S., Shafiq, M., & Kakria, P. (2020). Investigating acceptance of telemedicine services through an extended technology acceptance model (TAM). *Technology In Society*, 60, 101212. <https://doi.org/10.1016/j.techsoc.2019.101212>
 17. Mathur, P., Srivastava, S., Lalchandani, A., & Mehta, J. (2017). Evolving Role of Telemedicine in Health Care Delivery in India. *Primary Health Care Open Access*, 07(01). <https://doi.org/10.4172/2167-1079.1000260>
 18. Michael Grieve, M. (2020). Top 10 Benefits of Telehealth for Patients and Doctors. Ortholive.com. Retrieved 2 October 2020, from <https://www.ortholive.com/blog/top-10-benefits-of-telehealth-for-patients-and-doctors>.
 19. Mohfw.gov.in. (2020). Retrieved 2 October 2020, from <https://www.mohfw.gov.in/pdf/Telemedicine.pdf>.
 20. PMC, E. (2020). Europe PMC. Europepmc.org. Retrieved 2 October 2020, from <http://europepmc.org/abstract/MED/9048466>.
 21. Security and HIPAA | AAAAI. The American Academy of Allergy, Asthma & Immunology. (2020). Retrieved 2 October 2020, from <https://www.aaaai.org/practice-resources/running-your-practice/practice-management-resources/Telemedicine/HIPAA>.
 22. Shuren, A., & Livsey, K. (2001). Complying with the Health Insurance Portability and Accountability Act. *AAOHN Journal*, 49(11), 501-507. <https://doi.org/10.1177/216507990104901103>
 23. TELEMEDICINE - WHO. (n.d.). Retrieved October 2, 2020, from https://www.who.int/goe/publications/goe_telemedicine_2010.pdf
 24. Telemedicine and its Role in Revolutionizing Healthcare Delivery. (n.d.). Retrieved October 02, 2020, from <https://www.ajmc.com/view/telemedicine-and-its-role-in-revolutionizing-healthcare-delivery>
 25. Vaportzis, E., Giatsi Clausen, M., & Gow, A. (2017). Older Adults Perceptions of Technology and Barriers to Interacting with Tablet Computers: A Focus Group Study. *Frontiers In Psychology*, 8. <https://doi.org/10.3389/fpsyg.2017.01687>

26. What are the Advantages of Telemedicine? | Doxy.me. Musc.doxy.me. (2020). Retrieved 2 October 2020, from <https://musc.doxy.me/advantages-of-telemedicine>.