

Telehealth: Benefits and Challenges in India- A Systematic Review

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ABSTRACT

Introduction: The Health Resources and Services Administration defines telehealth as “The use of electronic and telecommunications technologies to support and promote long-distance clinical healthcare, patient and professional health-related education, public health and health administration”. Telehealth or Telemedicine has been around for decades, however the uptake of these services remained low, despite the myriad of reported benefits. The current COVID-19 pandemic is putting telemedicine into the spotlight. Telehealth, accessibility of health services, especially in remote areas can be drastically improved. This is particularly beneficial for rural communities in the developing countries like India. The advances in internet technology and growth of internet across India’s population have provided a tremendous opportunity to develop innovative telehealth solutions.

Aim and Objectives: The objectives of this systematic review was to examine the benefits and challenges of telehealth in India.

Materials and methods: A systematic search was conducted and a total of 54 articles that met the inclusion criteria were examined. Data and factors evolving around telehealth and telemedicine were extracted and descriptively synthesized from the inclusion articles. A awareness program survey was conducted among the healthcare students.

Results: The increasing emphasis on patient satisfaction, providing efficient and quality care and minimizing cost have also led to high telehealth implementation. Overall, there are several benefits as well as barriers for telehealth which needed to be discussed. Despite this, there is a paucity of high-quality research to this topic. Even though telemedicine cannot be a solution to all problems. It can surely help decrease the burden of healthcare system to a large extent.

Key words: “telehealth”, “telemedicine”, “m-health”, “teleconsultation”, “pharmacist and telehealth”, “role of telehealth”, “telecare”.

I. INTRODUCTION

Worldwide, various health systems are facing sustainability challenges to meet the healthcare needs of the growing population. This holds true especially in the rural and remote areas where demand for reforms is needed in delivery of care and the enabling technologies to support their healthcare systems. Healthcare situations such as poor access to care, shortage of healthcare providers per patient, increased demand for care and unaffordable healthcare costs are creating a storm of challenges in this sphere. According to the report published by the United Nations Department of Economics and Social Affairs⁽⁵⁾, the population of developing countries is projected to rise from 5.9 billion in 2013 to 8.2 billion in 2050. With reduced mortality and increased life expectancy, population growth is shown to be extremely dramatic, particularly in the age group of 60 or more. The annual population growth rate during 2010-2015 of the 3.5% is estimated to increase by an additional 2.9% annually before 2050⁽¹⁾. Further, the disease burden of noncommunicable diseases is rising among adults as well⁽²⁾. Emergencies of growing cardiovascular diseases, diabetes, cancers and lower respiratory conditions now constitute the most common causes of death. As prevalence of chronic diseases increases with age, an increase in the age group of 60+ plus indirectly indicates growth in non-communicable chronic conditions in the future⁽³⁾. These statistics suggest an increase in the demand for innovative solutions to disseminate public health services. Moreover, lack of initiatives in immobilization or strengthening human resources along with work force shortages are other major challenges that would be faced by developing nations towards building a sustainable and widespread health system.

Approximately 0.91 beds per 1000 population is available in

India when compared to global standards with 4 beds per 1000⁽⁴⁾. Further as estimated by WHO, by the year 2035, the world will be short of 12.9 million healthcare workers, current status being 7.2 million across the globe⁽⁵⁾. These findings are important indicators of dynamic population demographic, workforce shortages and evolving health needs of the people. The above-mentioned challenges, combined with existing financial pressures within the healthcare sector demonstrate that traditional delivery methods of health services alone will not suffice. Instead, an integrated approach towards disease prevention enabling independence in care and well-being of patients and encouragement of self-care and self-management by patients is required. With appropriate strategies, telemedicine has the potential to enable changes required to respond to these needs. A technology that allows for video-conferencing, remote patient monitoring and secured data transfer becomes readily available and as payers begin to offer reimbursement for using that technology, health systems are becoming increasingly interested in expanding their telehealth offerings and incentivized to do so. This systematic review will analyze the benefits of telemedicine and discuss about the barriers or challenges faced by telemedicine in India.

Research Questions

1. What are the legal barriers for providing international consultation via telehealth systems?
2. How to overcome the challenges and barriers of Telehealth?
3. What are the steps to improve effective implementation of telehealth?
4. What are the most recent technical advances and practical implementation and the impact of industry on electronic health record and telemedicine?
5. What is the cost-effectiveness of the use of telemedicine to facilitate the delivery of healthcare interventions and consultation for patients in long-term care facilities?

METHODS

A systematic review was performed to explore the current literature as it pertains to the clinical question. Databases searched include Medline (PubMed), Google Scholar, Research Gate, Cochrane and ScienceDirect. Specific databases including general

subjects covered, specific data range and search restrictions included in the Table 2 of attached appendix.

Search limits applied to database researches included results from 2015 -2021, full text available, peer reviewed, references available and English language. Search terms used included “telemedicine”, “m-health”, “teleconsultation”, “pharmacist and telehealth”, “role of telehealth”, “telecare”. Bibliographic review was also utilized for additional relevant articles. The number of articles hits obtained for every keyboard search in each of the databases were recorded and searches with 54 or fewer hits were chosen for a brief review of titles and abstract given in Table 2 of the Appendix.

Feedback analysis: An awareness survey was conducted among the healthcare students.

Inclusion and Exclusion Criteria

Article titles and abstract were reviewed and duplicates were eliminated. A total of 54 studies were further assessed for inclusion or exclusion in this literature review (Table 2). Those articles whose title and/or abstract suggested its relevance to the phenomenon of interest and identified clinical question were marked for further review. The exclusion of articles was based on predetermined criteria. Articles were excluded if the patient population was not adult, and the articles with small sample size was also excluded.

Study Characteristics

Despite the growing number of studies related to the question, telehealth research continues to lack high quality research. In this systematic review, numerous articles gathered information on the benefits and challenges of telehealth. However, there was a lack of Randomized Control Trials (RCT), as well as systematic reviews of meta-analysis. Design and quality of the included literature was varying with only 3 of the 54 selected articles being RCTs. Although there were sufficient systematic reviews included, none included evidence from RCTs.

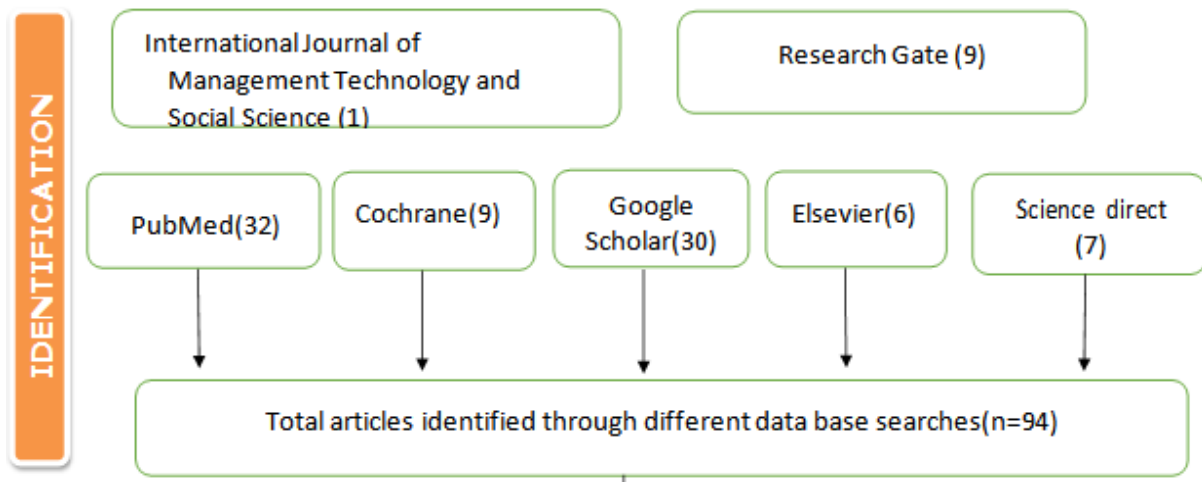


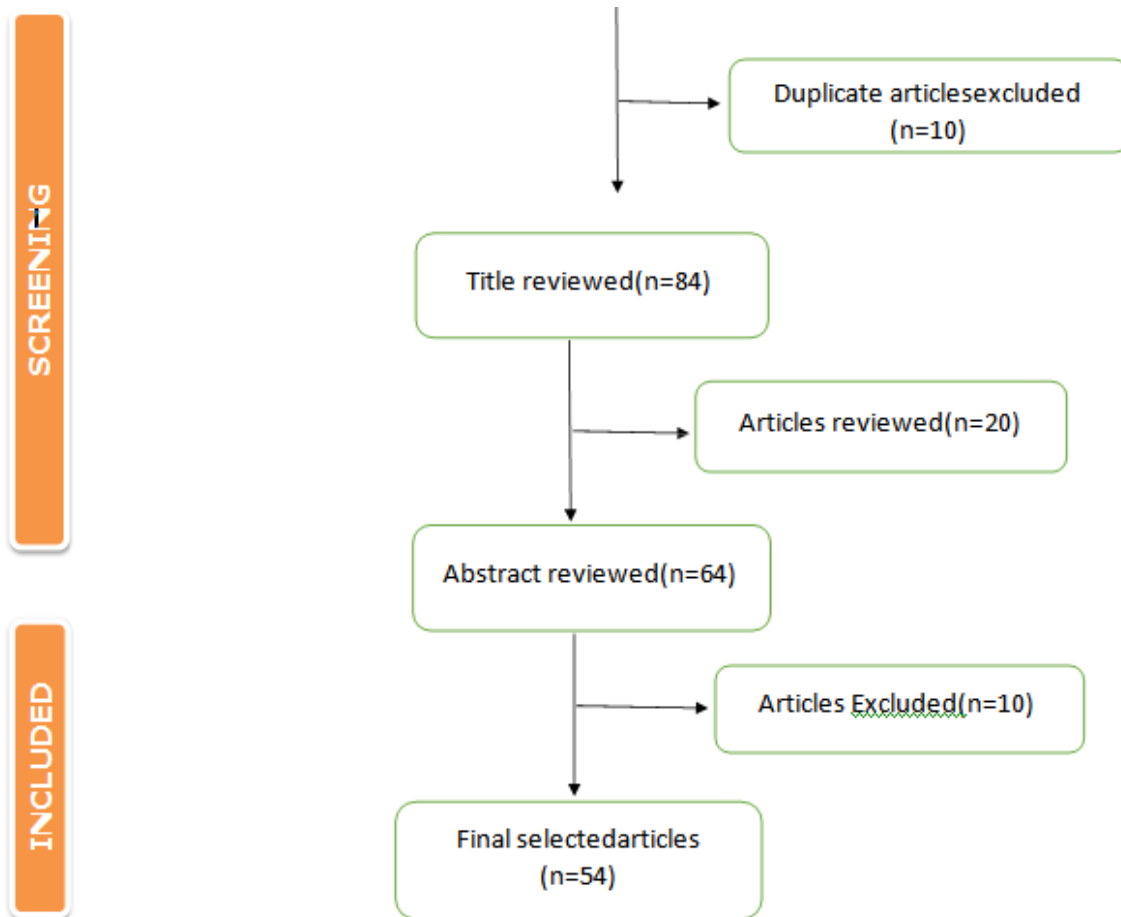
DataBase	Restriction added to research	Dates included in database	General subjects covered by database
Medline	Full text, English language, reference available	2015-2021	Citation information and abstracts of published articles and books
Googlescholar	Full text, English language, reference available	2015-2021	Academic journals and books
Cochrane	Full text, abstract available, peer reviewed	2015-2021	Systematic reviews of primary research in human health care and policy
Elsevier	Full text with reference	2015-2021	Systematic reviews of primary research in human health care and policy
Science direct	Full text with reference	2015-2021	Citation information and abstracts of published articles and books
Researchgate	Full text with reference	2015-2021	Academic journals and books
International Journal of Management Technology and Social Science	Full text available with abstract and reference	2015-2021	Academic journals and books

Date of Search	Key Words	Medline	Cochrane	Google Scholar	Elsevier	Science direct	Research Gate
09/08/2021	“Telehealth”	9	3	10	3	2	2
10/08/2021	“Role of telehealth”	6	2	5	2	2	2
12/08/2021	“Telemedicine”	3	3	6	1	3	1
15/08/2021	“Telehealth or telemedicine”	9	1	3	-	-	3
20/08/2021	“Pharmacist and telehealth”	2	-	4	-	-	-
21/08/2021	“m-health and tele-consultancy”	3	-	2	-	-	-

Synthesis of Research

After an in-depth review of 54 articles that met inclusion criteria, the following summary of the literature was formulated. All of the articles that met the inclusion criteria included scholarly publications specifically addressing factors that affected benefits and challenges with telehealth in adults’ population.





II. RESULT:

When telehealth is implemented as an alternative to in-office visits, studies show that participants report saving time, money and reducing stress and burden related to travel (Cox et al., 2017). Long distance travel for healthcare can cause absenteeism from work and family, dependence on caregivers for transport and childcare, increased cost and lack of access to healthcare (Orlando et al., 2019).

Telehealth not only has been shown to alleviate burden related to travel and convenience, it also extends services to rural areas where providers are not available. Rural healthcare providers strive to keep abreast of the scientific research and evidence-based practice that is rapidly changing.

With healthcare changing and evolving, the need to provide patient access to specialty care for chronic disease is a necessity, however many patients do not have access to this level of care, especially in rural areas (Kruse et al., 2017).

The cost of CGC via tele-genetics was less

than half that of in-person CGC provides hope for oncology clinics who want to access to CGC but cannot find and in-person genetic counselor. Tele-genetic may be acceptable to all underserved individuals. However, patient satisfaction was high among those who did attend a tele-genetic session, even among individuals who might not be expected to be comfortable with computer (Adam Buchanan et al., 2015).

The key motivator expressed by participants was the easy with reduced travel time. This is in agreement with other studies in patients with COPD, where tele-rehabilitation provided access to clinicians with specialized knowledge in the area. Similarly in a qualitative study, patients with total knee arthroplasties describe the elimination of travel as the predominant benefit of tele-rehabilitation. Another strong motivating influence in our study was social from the family, other participants and the clinicians (Rita Hwanget al., 2017).

The patient's satisfaction can be associated with modality of telehealth but factors of effectiveness and efficiency are mixed. Patient's

expectation was met when providers delivered healthcare via video conference or any other telehealth method. Telehealth is a feasible option for providers who want to expand their practice to remote areas. Developed, special care should be given to incorporate features that enable acceptance and reimbursement of this modality (Kruse et al., 2017).

Certainly, there are limitations to patient care via telehealth, including cost of providing and maintaining equipments, need for internet access, possible perceived change in relationship due to lack of face-to-face contact, limitations in reimbursement, challenges during emergency situations, and potential medico-legal issues. However, decreased need for long distance for rural patients, decreased communicating time for urban or suburban patient, decreased time of work, potential for increased frequency of access to providers and increased access to subspecialty care will likely outweigh the limitations as telehealth services are expanded. In addition, because many patients with neuromuscular and musculoskeletal disorders have disabilities which complicate travel and transportation, the provision of telehealth may be especially important in improving their access to care and decreasing associated cost (Ileana M. Howard et al., 2018).

Technology plays a crucial role in addressing barriers to health care access for people living in rural areas. Videoconference in general real-time audio-visual communication with outcomes not significantly different from face-to-face appointment. Despite advances in technology, a number of challenges are known to influence the success sustainability of telehealth in rural and remote areas. Governance and stakeholder support, demonstrated economic value with consistent activity reimbursement capacity, service adaptability to the targeted population and efficient administrative and clinical processes are some of the known challenges in telehealth. One study in India was influenced in interpreting satellite signal and in consistent audio-visual quality. Poor infrastructure technology in this setting, in addition to higher running costs and low technical expertise present limitations for telehealth delivery and access (Orlando et al., 2019).

The potential advantage of tele-rehabilitation is clear and have the potential to facilitate access to services (thereby improving equity) and reduce cost

associated with providing rehabilitation programs. Tele-rehabilitation offers great potential as a replacement for or, as an addition to current therapies. It is currently unclear which patient groups are most likely to benefit from rehabilitation; for example, whether people living in remote areas may benefit and whether people that require enhanced support or rehabilitation on discharge or those many years post-stroke would benefit from a short-term program of rehabilitation.

Decrease in travel time/convenience

There is a consensus across the literature that decreased travel time and convenience are the biggest factors that positively influence patient satisfaction with telehealth (Cox et al., 2016). In a systematic review of cancer survivors, the patients felt their lives had been disrupted by the cancer diagnosis and telehealth intervention allowed the patient to manage their care remotely which minimized the disruption in their life. Convenience was reflected in different ways throughout the literature, when telehealth replaces in-office visits, patient did not have to travel, thereby saving time and money, resulting in decreased stress related to burden of travel time (Cox et al., 2016). Patients found that telehealth intervention not only decreased travel time but also reported that the remote communication increased an anonymity by allowing them to focus on their concerns in their cancer diagnosis (Cox et al., 2016).

Cost saving

Due to the increase in healthcare cost, healthcare providers shortage and mandate to decrease expenditure, cost saving is critical for healthcare institution. The use of telehealth intervention as provider solution for many healthcare, one being cost saving. In a systematic review in 2017, cost saving was common theme that positively influenced patient satisfaction and telehealth use throughout the literature (Kruse et al., 2017). Telehealth not only is a cost savings for healthcare facilities but also for patient. Patients who did not have health insurance had 20% greater odds of preferring telehealth over in-office visits due to cost saving (Polinski et al., 2015).

Clinical outcomes

Measuring, reporting and understanding patient outcome is fundamental in providing quality healthcare and represent an opportunity for redefining patient care, fostering improvement and

provides opportunity for better practice. Through a systematic review (Kruse et al., 2017), identified that telehealth is pivotal in decreasing hospital admissions, improves medication adherence and improves patient outcomes.

Additionally, one telehealth program within this systematic review found a 56% reduction in ambulance transport by implementing telehealth services, while another program reduced readmissions from 12 to 4 over a 12 months period (Kruse et al., 2017). Another study in that systematic review found patients in the study group receiving telehealth management if their diabetes significantly reached their optimal insulin levels when compared to control group who did not participate in telehealth (Kruse et al., 2017). A large chronic disease self-management and 80% improved medication adherence (Kruse et al., 2017).

Overall patient satisfaction

An estimated 81% of providers describe themselves as being overextended or at full capacity, with not meeting additional patients or travel to tertiary healthcare sites to provide outreach care (Polinski et al., 2015) emerging technologies in healthcare have introduced telehealth as an option to increase access of healthcare for patients and allow providers to further extend their patient population without the additional travel time.

In a different systematic review of patient and care giver satisfaction with telehealth by Orlando et al., they discussed that of the 36 articles reviewed only one study found that face-to-face appointments were preferred, which was hypothesized due to older demographics and low travel distance required for in-office visits. In a large cross-sectional survey with 1734 patients, 95% were very satisfied with telehealth quality and found telehealth to be comparable, if not better than in-office visits with telehealth providers (Polinski et al., 2015). An interesting finding in that study was that of the 5% of the participants who preferred in-office visits, they contributed it to a strong bond between the assisting nurse and or provider and were impressed with their capabilities during the physical examination ultimately outweighing telehealth services (Polinski et al., 2015).

Provider-patient relationship

Behavior that facilitates patient satisfaction and

patient-centered communication include open-ended questions, professionalism, cultural competence, rapport with patient, strong communication, empathy, emotional support, partnership building, shared-

decision making and ability to actively listen (Orlando et al., 2019). There were analogous findings in a 2019 systematic

review of 36 articles pertaining to patient and caregiver satisfaction with telehealth services, remarking that communication between the provider and patient positively influenced satisfaction with telehealth (Orlando et al., 2019). The participants in the study felt that they were listened to, had their concerns addressed, had time to ask questions and participated in the decision making (Orlando et al., 2019). Patients in these 36 articles of the literature review were most satisfied with the privacy and confidentiality features during the telehealth, noting that it was easier to talk about certain personal items through the telehealth compared to face-to-face visit, especially if the provider was actively listening (Orlando et al., 2019). Another positive feature of telehealth communication is that it was shown to positively shift the focus of care away from the provider and toward the patient's preferences and needs (Cox et al., 2017).

Inhibiting influences of telehealth

There are a number of challenges that influence the success and sustainability of telehealth use even despite advances in technology. Factors that negatively impact patient satisfaction appeared salient throughout the literature in a contrast to convenience (Cox et al., 2016, Orlando et al., 2019). Nine of the studies in (Cox et al., 2016), systematic review found that telehealth patients perceived the experience as impersonal and lacking in physical contact, suggesting the need to meet the provider at least once prior to initiating telehealth interventions. Technology issues resulted in jeopardized communication due to visual or audio concerns, with lower satisfaction scores displayed for auditory clarity, image freezing, image absence, sub-optimal sound qualities and internet drop-outs in a mixed method study of heart failure patients utilizing telehealth (Hwang et al., 2017). It should be noted through that despite technology issues participants perceived the health outcomes and convenience outweighed the technical issues (Hwang et al., 2017). Another interesting finding is that while technology challenges are present among most

of the studies, computer experience did not seem to inhibit telehealth patients' satisfaction with some participants reporting that no computer experience was positive challenges (Hwanget al., 2017)

On the other hand, the RCT by (Buchanan et al., 2015) mentioned that telehealth had significant negative findings for telehealth that were influenced by technology use. In-

office visit patients were significantly more likely to adhere to appointment times (89%) compared to telehealth patients (79%) the biggest factor being technology comfort and knowledge. It was also noted that 15% of the telehealth patients

in the study required assistance with technology devices and 7% of the counselling sessions could not be completed due to connectivity and hard drive crash (Buchanan et al., 2015). Although, a majority of the patients in the study (64%) required no assistance with the telehealth devices (Buchanan et al., 2015)

Very few of the studies reviewed discussed accuracy of diagnosis during telehealth visits, with the

exception of the (Piga et al., 2017), who conducted a systematic review that found one of the 23 studies had a disappointing finding related to accuracy of telehealth visits. The disappointing findings showed a 40% accuracy rate for diagnosis, which was determined by first having patients see a junior doctor via telehealth

for provisional diagnosis, followed by the final diagnosis made by an independent consultant rheumatologist (Piga et al., 2017). Recommended enhanced provider training and improved technology devices that have diagnostic features such

as a camera, stethoscope and otoscope focus to improve diagnosis accuracy (Piga et al., 2017)

Telehealth interventions are superior to usual care in breast cancer patients for improved QOL and self-efficacy, with less depression, distress and perceived stress. However, these results should be recognized cautiously due to between study heterogeneity. Further RCTs on the application of telehealth interventions are warranted (Yan-Chen et al., 2017).

III. DISCUSSION

Telehealth has become one of the most rapidly expanding components of the healthcare system, with an extensive history of research on various aspects of telehealth. Patient satisfaction is a priority when analyzing telehealth, because redundant and expensive (Kruse et al., 2017). This review narrowed the focused by

listing out barriers faced

by telehealth and the various benefits by using telehealth. From this literature synthesis there were distinctive analytical theme that emerged as factors influencing patient satisfaction with telehealth when compared to in-

office visits. These were categorized as overall patients' satisfaction with telehealth when travel time/convenience, access to healthcare, cost savings, clinical outcomes, provider relationship and inhibiting influences of telehealth. The overall findings are in consensus that patients are equally if not more satisfied with telehealth when compared to in-office visits, however there is a consistent lack of high-quality research related to this topic. As telehealth symbolizes the feasibility and practicality of an alternative mode of healthcare is compared to the standard in-office visit. Patient satisfaction is defined as per the U.S. Center for Medicare and Medical Service as "the patient's perspective of care which can be objective and meaningful to create comparisons of hospital and other organizations" (Kruse et al., 2017). It is important to recognize that telehealth must align with patient's value and expectations to have positive overall satisfaction and clinical outcomes (Orlando et al., 2019).

The literature reviewed demonstrated that telehealth can support patients in all different specialties and any pointing their acute and chronic healthcare journey. With the wide variety of specialties that telehealth can encompass, travel time to see a provider can be a burden and inconvenience, making decrease travel time and convenience to be the most commonly cited and highest overall positive factor influencing patient satisfaction (Cox et al., 2017;

Hwanget al., 2017; Kruse et al., 2017; Orlando et al., 2019). When telehealth is implemented as an alternative to in-

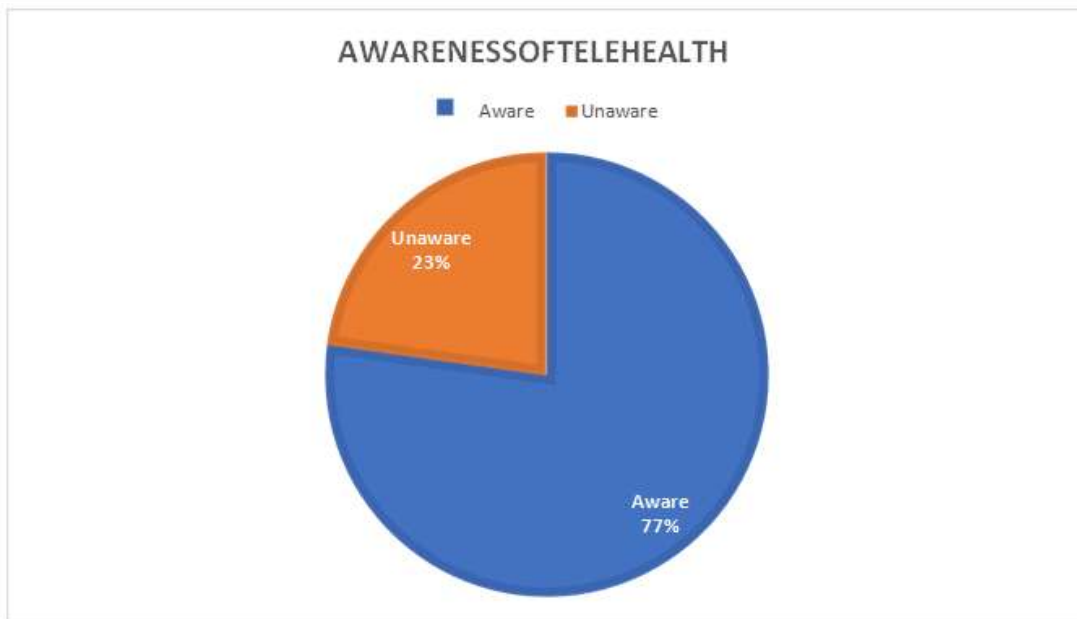
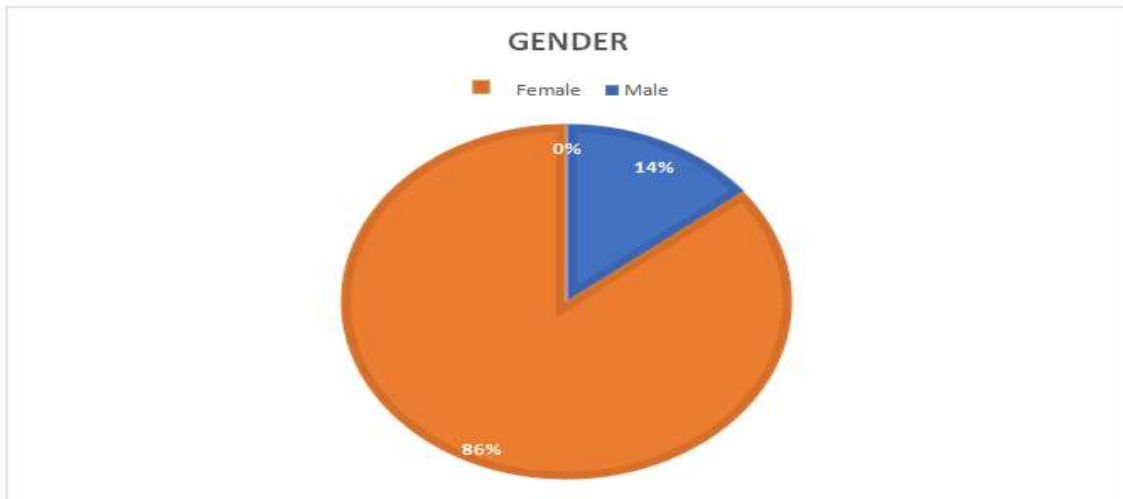
office visits, studies show that participants report saving time, money and reducing stress and burden related to travel (Cox et al., 2019). Long distance travel for healthcare can cause an absenteeism from work and family, dependence on caregivers for transport and childcare, increased cost and lack of access to healthcare (Orlando et al., 2019).

Telehealth not only has been shown to alleviate burden related to travel convenience, it also extends services to rural areas where providers are not available. Rural healthcare providers strive to keep abreast of the scientific research and evidence-based practice that is rapidly changing. With the healthc

are changing and evolving, the need to provide patients access to specialty care, especially in rural areas (Kruse et al., 2017). This signifies the importance of utilizing telehealth to improve patient outcomes, overcome the barrier of proximity and in turn benefit healthcare system at large (Kruse et al., 2017). When implementing a new mode of healthcare delivery, it is important to validate that patients are not only satisfied and the cost is feasible, but also ensuring they are displaying improved clinical health outcomes, as this in turn affects overall patient satisfaction. While it is evident there is a need for more research related to

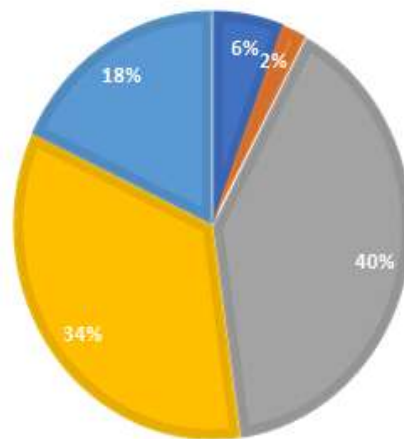
how telehealth impacts patient outcomes, how clinical outcomes were influenced by telehealth was covered in few studies found there was overall improvement in various clinical outcomes measure and some having a lasting effect (Kruse et al., 2017). The technology base of telehealth significantly independent of the modality (Kruse et al., 2017). Telehealth intervention is superior to usual care in breast cancer as telehealth provide improved quality of life, high self-efficacy and less depression. Still there is a need for discussion on this further development in the telehealth intervention (Ya-Yen Chen et al., 2017).

ELEHEALTH IS COST SAVING AND EFFECTIVE



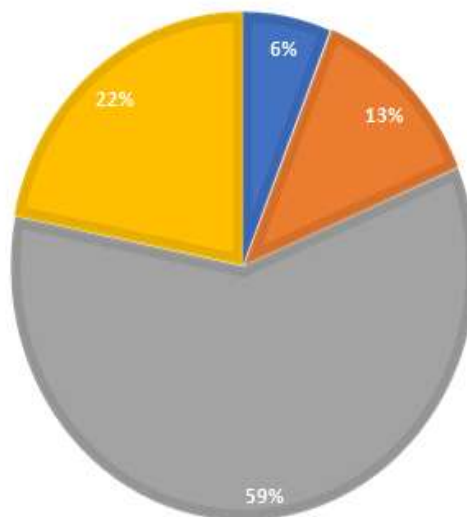
YOUR KNOWLEDGE ABOUT TELEHEALTH/TELEMEDICINE

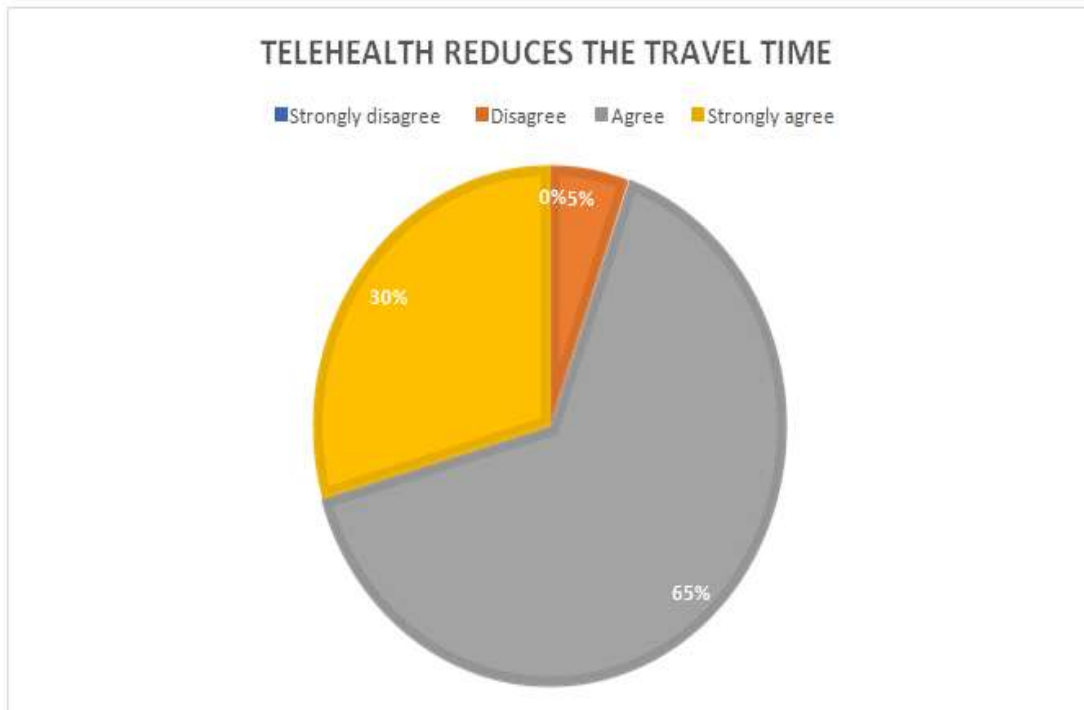
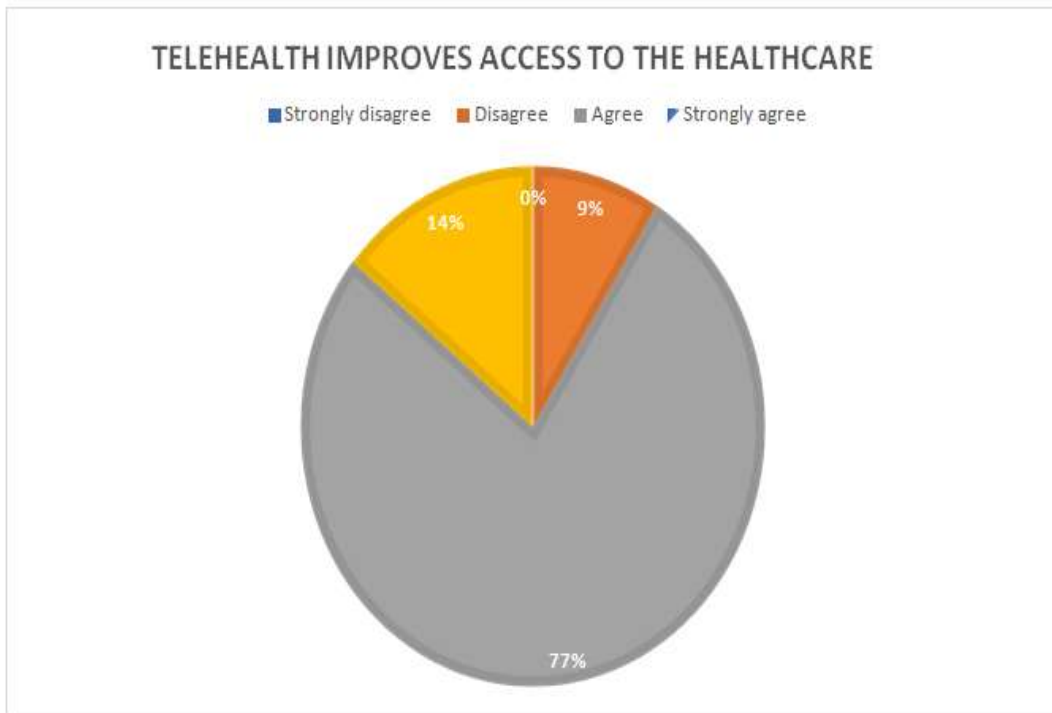
- Access to healthcare using technology
- Virtual consultation with doctor via video-conferencing
- Done primarily online with internet access on your computer, tablet, or smartphone
- Send and receive messages from your doctor using secure messaging, email, secure messaging and secure file exchange
- All of the above



HOW ARE YOU AWARE ABOUT TELEHEALTH?

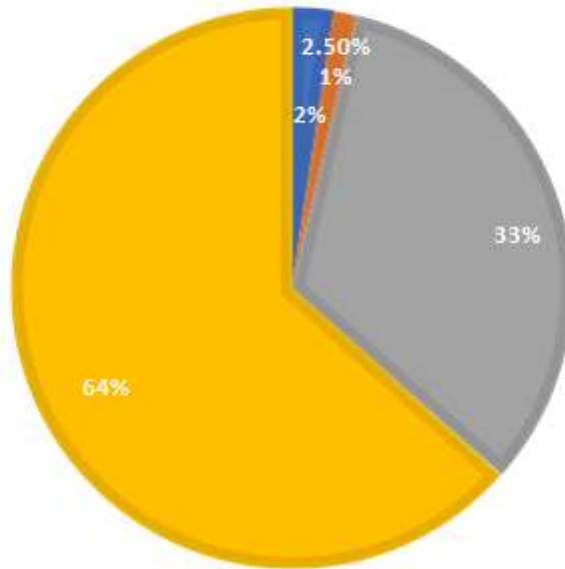
- Physician
- Other healthcare professionals
- Relatives
- Social media





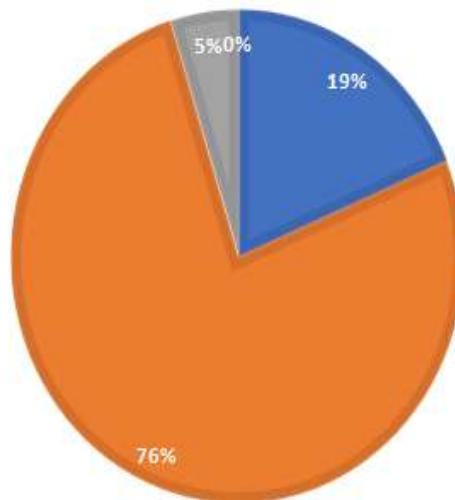
TELEHEALTH IS COST SAVING AND EFFECTIVE

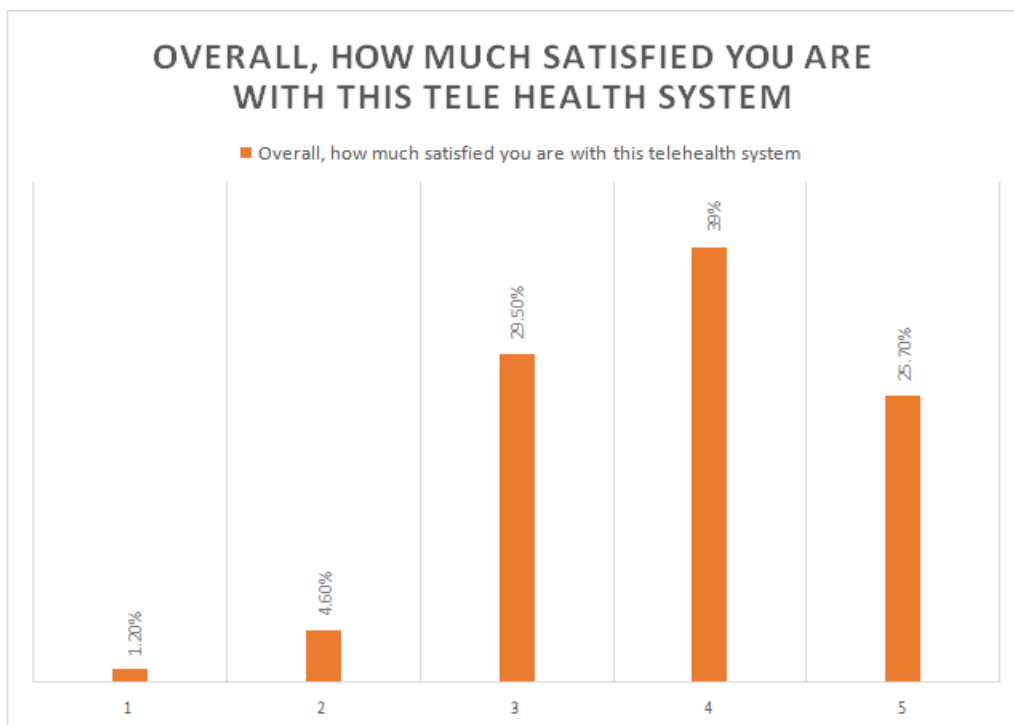
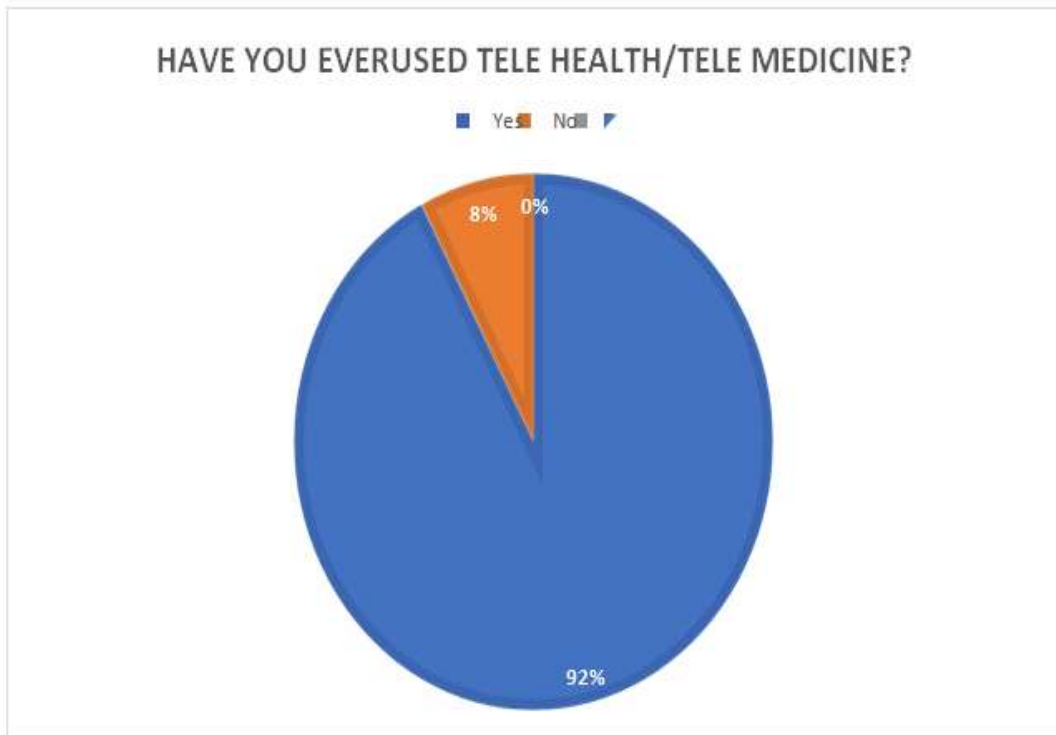
Strongly disagree Disagree Agree Strongly agree



TELEHEALTH IS USE FULDURING THE PANDEMIC (EG: COVID-19 PANDEMIC)

Yes No Maybe





IV. CONCLUSION

With the increasing healthcare costs, shortage of providers and increased patient expectation, technologies advances have made an

exceptional alternative mode of healthcare delivery. This synthesis of findings from qualitative and quantitative research consistently shows findings that telehealth has a positive impact on patients

‘satisfaction with capability to empower patients to manage their overall health by providing a better connection to healthcare. While the findings suggest that telehealth interventions have the capacity to facilitate a positive experience of personalized healthcare, it is important to take personal factors and consumer focus into account to maximize the benefits and minimize the burden of telehealth. Further higher quality research with standardized methodologies to assess patients’ satisfaction will aid the development of future telehealth interventions and guide developers to avoid factors that constrain positive user experience, thereby improving telehealth participation and engagement. The growth of telehealth till now and the benefits of telehealth need to be discussed more to provide awareness among the general public.

Feedback analysis survey: From the 241 responses collected from the telehealth awareness survey it was concluded that 72.2% of the people are aware of the telehealth system but among the 72.2%, 68.9% have not used the service, this may be due to lack of knowledge and understanding about the benefits of telehealth or due to confidentiality issues and lack of technological development. Therefore, the knowledge about telehealth can be provided among the general public through awareness program and also high-quality research will aid the development of future telehealth interventions.

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