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Review Article

Telemedicine vs. In-Person Healthcare in Pakistan: A literature Review

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Abstract

This literature review examines the evolving landscape of telemedicine versus traditional in-person healthcare in Pakistan, focusing on telemedicine's transformative potential to address barriers such as geography, affordability, and access, particularly in remote areas. Telemedicine, facilitated through asynchronous, synchronous, and remote monitoring technologies, offers significant advantages in terms of convenience, cost savings, and enhanced patient satisfaction. Despite historical challenges such as technological and financial barriers, recent advancements in information and communication technologies (ICT), increased mobile internet access, and supportive funding have propelled telemedicine adoption, especially during the COVID-19 pandemic. The review highlights high patient satisfaction rates due to the convenience and reduced costs of telemedicine, though issues like privacy, security, and inadequate infrastructure remain. Studies on telemedicine in obstetrics, gastroenterology, and psychiatry demonstrate positive patient and provider feedback, while emphasizing the need for improved user experiences, effective communication, staff training, and enhanced technological infrastructure. Utilizing the Technology Acceptance Model (TAM), this review proposes a Telemedicine Service Acceptance Model to understand the factors influencing telemedicine adoption in rural areas of developing countries like Pakistan. Overall, telemedicine shows promising potential to enhance healthcare access and equity, requiring ongoing collaboration among clinicians, public health experts, and IT professionals for successful implementation.

Keywords: Telemedicine, In-person Healthcare, Patient Satisfaction, Provider Satisfaction, Implementation Challenges, COVID-19 Pandemic, Technology Acceptance, Digital Infrastructure, Rural Healthcare, Healthcare Equity, Pakistan

Introduction

Telemedicine refers to seeking medical consultation via telecommunication, addressing barriers like geography or affordability that hinder in-person visits. It encompasses three main technologies: asynchronous (store and forward), synchronous (two-way interactive), and remote monitoring, each serving different healthcare needs [1]. Asynchronous telemedicine transfers medical data like history and test results for non-emergent cases,

facilitating timely diagnosis and treatment. Synchronous telemedicine offers face-to-face consultations and real-time health monitoring through video or remote data review [1].

Telemedicine has become integral in healthcare, addressing challenges like access and cost, particularly benefiting remote patients by eliminating travel expenses and time off work [1,2]. As it evolves, telemedicine aims to match or exceed in-person care efficiency [2]. It's widely applied across medical disciplines, from user-friendly mobile apps to complex systems in specialized hospitals, benefiting fields like pathology, radiology, and dermatology [3,4].

Historically, telemedicine faced technological and financial barriers, hindering its adoption. Recent advancements in ICT, cost reductions, and increased mobile internet access have overcome many of these challenges, supported by governmental and non-governmental funding [5,6]. Developed nations integrate telemedicine to enhance rural healthcare access, contrasting with developing nations where adoption lags, despite its potential to improve healthcare delivery [7-9]. Concerns remain about privacy, security, and data misuse, impacting telemedicine's reliability [10].

Pakistan, a densely populated nation, confronts significant healthcare challenges, including difficulties in healthcare access due to geographical, cultural, and socioeconomic barriers [11]. Telemedicine emerges as a potential solution by alleviating the necessity for patients and healthcare providers to travel. The COVID-19 pandemic highlighted the critical role of telemedicine amid global lockdowns and quarantines. The suspension of non-urgent medical procedures and closure of outpatient services during the pandemic underscored the growing importance of telemedicine in Pakistan. The emphasis on physical distancing further accentuated its value, leading to increased adoption [11]. Despite challenges like inadequate healthcare infrastructure and telecommunications, the deployment of broadband services in remote regions and the rise of telemedicine startups such as Oladoc, Mehram, Find My Doctor, and Sehat Kahani offer promising prospects for telemedicine in Pakistan [10]. Gathering feedback from healthcare users and providers is essential for identifying and addressing challenges, as the success of telemedicine hinges on both patient and provider acceptance of these technologies. Studies indicate high levels of patient satisfaction with telemedicine [12], attributed to its convenience, accessibility, enhanced comfort, and improved confidentiality for patients and families, and reduced risk of contagion [13].

This review compares telemedicine and traditional in-person healthcare in Pakistan, highlighting its transformative potential while acknowledging ongoing challenges and global disparities in adoption and regulation.

Literature Review

Patient and Provider Satisfaction with Telemedicine

The Office of the National Coordinator for Health Information Technology defines telemedicine as "the use of electronic information and telecommunications technologies to support and promote long-distance clinical health care, patient and professional health-related education, public health and health administration" [14] telemedicine needs to give favorable outcomes with in person visits in a variety of objectives measures including clinical outcome [15], cost (both direct and indirect. In addition, patients and providers need to be at least as satisfied with their telehealth experience as they are with in-person visits. If it's not the case then telemedicine would not be widely accepted. Ideally, six dimensions need to be considered when measuring quality of care. Which includes overall satisfaction with care, who the stakeholders are, the type of system used (it could be either synchronous or asynchronous visits), type of care used, the context in which the care is delivered, and the methods which were used [16]. In a meta-analysis of 221 studies of patient satisfaction some dimensions of a patient's view of quality were identified [17] some of these dimensions like physical facilities (the patient can be seen in their home), continuity of care (the same provider can be seen regardless of where they are located), access (less distance needs to be travelled), cost (no need for gas, meals, hotels), and bureaucracy (long lines and waiting rooms are avoided) are favoured by the use of telemedicine. While the Dimensions for which an in-person visit may favourably influence satisfaction include humaneness (the personal touch is present) and the amount of information exchanged (including body language, the ability for more back and forth discussion, and immediate delivery of handouts). For some dimensions like technical competence of the provider and patient, patient outcomes, and attention to psychosocial problems the influence of both telemedicine and in person visits is unclear. The psychosocial dimension is of importance here as it varies among people with some of them finding it easy to discuss sensitive issues while others might be reluctant. Thus in a nutshell when we look at these dimensions collectively and deduce results from them then it becomes difficult to say that telemedicine has an advantage over in person visits. When taking into account the type of system used to deliver telemedicine tele medicine has also shown to be more convenient as patients tend to state that reduced time travel and cost were the main reasons for their inclination towards telemedicine [18]. A study by minute clinic in the year 2016 found that 98% of the patients were satisfied with synchronous telemedicine [19]. On the other hand, in a study of asynchronous TM involving either interpretation of EKGs or delivery of lab results involving 564 patients, the quality of care both by patients and healthcare professionals was perceived to be improved [20] similarly in a systematic review telemedicine patients satisfaction with tele dermatology found that 98% of the patients were satisfied with the asynchronous telemedicine, in which images for the rashes were shared with the doctors for further review [21]. While a lot of studies have been done to assess patients satisfaction level for telemedicine, on the other hand there are just a few studies that highlight the providers satisfaction with telemedicine which along with patients satisfaction plays a crucial role in the wide acceptance of telehealth. A study of satisfaction among 161 providers and 201 patients using video telemedicine for treating depression found a mean score on a 3-question survey of 9.17 for providers and 9.70 [21]. Thus, after these extensive studies it was ultimately found that

the satisfaction levels were quite high in both the patients and well as the providers for telemedicine.

Challenges and Opportunities of Telemedicine Implementation in Pakistan

Pakistan, like many other densely populated countries of the world, faces many healthcare challenges. Access to healthcare is being one of them, due to socioeconomic, cultural and social barriers [22]. Telemedicine use in Pakistan has risen due to covid 19, where people feared contracting covid 19 but also from the last few years due to the contributions by both non-profit [23] and academic centers telemedicine has been gaining popularity [24]. With the aim that telemedicine could be a solution to the accessibility issue of healthcare delivery in Pakistan some factors need to be addressed as whether or not this use of telemedicine will address the issue of accessibility or is it going to further widen the gap. The issue of doctor patient relationship also needs to be addressed. Also the fact that patient who would be using telemedicine need to be familiarized with all forms of technology based communication tools as telemedicine isn't just a video call [25] the challenges that long term application of telemedicine use is the lack of acceptance of technology by the patients, patients health literacy could be a hurdle in the long term application plus it also disrupts doctor patient relationship as the diagnosis could be difficult for these patients to understand via telemedicine also lack of detailed physical examination can also may lead to missing out important points in the management of the patients like missing the loss of sensations and heart murmurs in chronic diabetic patients could interfere with their management. The long-term implication of telemedicine is not only a challenge for patients but for the doctor as well. Doctors who had been practicing traditional ways of medicine throughout these years would not be able to apply no touch medicine in a single day. They would need to re-educate themselves with technology, work on their team building and also would need to train their staff. For a country like Pakistan, it's high time that we start planning the use of technology in the healthcare system with the involvement of clinicians, public health and information technology experts. The major problem with its implication would be the policy development and establishing a system for monitoring and adherence. Creating a system for reliable reimbursement policies would be needed. Pakistan lacks giving focus to policy development in healthcare settings [26] maybe the use of technology in telemedicine may act as a stimulus for change. By identifying the problems we can make a good use of this once in a century covid 19 pandemic [27] by using telemedicine for health care delivery for chronic diseases like hypertension and diabetes and through its implementation we could also break the barrier and bring equity in healthcare delivery that has been a lifelong dream.

Understanding and Measuring Patient Satisfaction in Telemedicine

Studies done internationally have highlighted the increased prevalence of dementia worldwide and stressed upon the need for strategies for the help of these people [28] in the management of these patients the rural population is disproportionately affected due to many barriers such as time, cost travel and lack of access to telehealth services and also the fact that rural areas have more older population in comparison to cities [29]. Different studies conducted during covid 19 showed that patient's satisfaction with telemedicine was high but the requirements for such results are not clear as people generally rate their healthcare system high and also the study was conducted inn time when it was easy for the patients like in covid 19, the studies conducted on patient satisfaction however limits its usage because it's unclear that which aspects of healthcare experience are most important to the patients in determining their satisfaction [30-31]. The second challenge is linking the general concept of satisfaction to a specific service within a healthcare setting meaning that researchers are unable to pinpoint the specific aspects of patients overall experience that are directly related to services provided that is quality of the medical care, the behaviour of the staff or the hospital amenities patient satisfaction is given importance as it direct affects the treatments results in patients and also affects patients compliance with a given treatment as patients satisfaction is a complex subject thus this study was done to access to review the studies that were done on patients satisfaction before and during covid 19 pandemic [33,34]. This study aims to find out the methods that not just define but also measure patient's satisfaction. As the use of telehealth drastically increased in covid so this must have led to increasing the knowledge on defining and measuring patients satisfaction [35] it's quite interesting how patient satisfaction has been defined in the literature, according to Donabedian's model it's the measure of opinions provided by the patients [36] while some related emotional and subjective component to it and said it's the extent to which patients experience of a healthcare matches with their expectations of an ideal healthcare that they have in their minds [37] as patients have their own idea of a perfect healthcare because of their own past experiences thus measuring patient satisfaction is based on a purely subjective criteria [31] some studies did prove this as satisfaction of patients in these studies were not even related to the treatment process itself but to their personal expectations towards the staff of the hospital and the location where the services were being provided [38] with the increasing use of telemedicine it was essential to access patients satisfaction thus the tools mostly were questioners [39] papers on patients' satisfaction before and during covid 19 were reviewed. The relevant papers were published between 1st January 2020 to 20th January 2020. Patients receiving treatments for different specialities were studied. Different questionnaires were used which included patient questionnaire, telehealth satisfaction questionnaires TESS, telehealth usability questionnaires TUQ and telemedicine satisfaction and usefulness questionnaire TSQ [40] while other studies used known validated and well defined questionnaires like patient satisfaction questionnaire 18 PSQ 18 [41] teleconsultation satisfaction questionnaire TSQ [31] short assessment of patient satisfaction SAPS [42] the reason why questionnaires were used as tools was because it allows data collection from a large population also it can be used to access the patients and service providers separately thus not affecting their relationship,

confidential data can be easily obtained through questionnaires and also the reliability and relevance of this questionnaire can be easily accessed through validation methods [29] thus when doing studies on patient satisfaction its very necessary that firstly the term patient satisfaction needs to be clearly defined , a proper tools needs to be selected whose reliability, relevance and reactivity to changes over time could be assessed with time if its intended to be used for a long time.

Patient Experiences and Future Preferences in Obstetric Telemedicine

There was an exploratory survey carried out to know about patient experiences in the obstetrics department at Shifa international hospital with telemedicine during COVID 19 and to know if they would prefer to use it in future [43]. Out of 678 patients 132 were randomly selected who were using Shifa International Hospital (SIH) TM facility from its start in March 2019 till July 2020. The sample size was calculated through WHO's Finite Population Correction (FPC) Sampling Calculator. Data was collected through a telephonic survey. A total of 22 questions were used, most were close ended. The questions were about information on the intent of the survey, a verbal consent clause; section on Demographics (i.e., age, parity, socioeconomic status, and education); in-depth questioning on four dimensions of telemedicine services, namely: appointment (8 question), staff attitude (4 questions), medical consultation i.e., antenatal consultation with doctors through online video calls (11 questions), Communication (8 questions); and a question inquiring future use of telemedicine. All the respondents were females in their reproductive age. An average respondent was 30 years old, having gravida of 2.36, parity of 1.40 and gestational amenorrhea of 27.3 weeks [44] The study found that each patient participated in a minimum of two telemedicine sessions, with a maximum of three and an average of 2.1 sessions. The primary reason for using telemedicine, accounting for approximately 80% of cases, was routine antenatal care, which remained consistent across those willing to continue using it and those who were not. A significant portion (57%) of participants expressed dissatisfaction with telemedicine compared to in-person visits. Issues such as unstable internet access (8%), privacy concerns (more than 4%), payment difficulties (5%), extended waiting times (6%), and perceived shortcomings in emergency handling and staff responsiveness were also reported. Additionally, 11% of participants cited dissatisfaction with the lack of physical examination and assessment of fetal well-being during telemedicine consultations [45]. Out of four independent variables, only two appear as statistically significant determinants of the participant's intent to use TM in future. Medical Consultations, i.e., antenatal care seekers' online video conversation and exchange with a doctor appears as the major determinant of future TM use. The other important determinant for future TM use is Communication. Those intending to use TM in future show higher satisfaction with their earlier TM use in all dimensions of the user experience. Telemedicine's future beyond COVID-19 for obstetrics depends upon improving users' experience primarily through consultant and staff training and provision of effective communication e.g. in regional languages. Besides, offering physical examination facility and ability to use mobile wallet payment solutions may motivate future use of telemedicine in obstetrics [46].

Patient and Physician Perspectives on Telemedicine in Gastroenterology

Telemedicine is a distant healthcare delivery, where technology is used to maintain long-distance clinical care and healthcare education and administration, without the want for physical communication [47]. A cross-sectional study was carried out at the gastroenterology department of Aga Khan University hospital [48]. Physicians at the department who had used telemedicine since June 2020 were called to fill an online questionnaire. 7 physicians participated. Patients who had at least one telemedicine appointment since June 2020 were enrolled using convenience sampling. The sample size was 160. Patients above 18 years were selected after proper consent was taken. Simple phone calls, internet-backed phone calls and videoconferencing were used. The mean age of participants was 49.8 ± 17.8 years, with 42.8% (n=68) males. Only 23.8% (n=38) of all visits were first visits, while 76.3% (n=122) visits were follow-ups. Most of the patients were satisfied with telemedicine as regards to physician patient communication. 39.6% (n=61) patients thought that the visit was equivalent to an in-person visit. The majority of patients (86.3%, n=138) said they would want to use telemedicine again. 144 thought telemedicine saved time, 137 were of the view that travel costs were saved. 96.1% were able to discuss their problems comfortably with the physician. Of the 7 physicians only 3 said they would recommend telemedicine to their colleagues. Limitations faced by the physicians included technical difficulty, trained team, lack of examination and inability to reach a conclusive diagnosis. Dependence on patient or doctor literacy on technology is a major disadvantage of telemedicine [49]. Apart from these difficulties in access for individuals with sensory deprivation is also a drawback [50]. Many of the patients in this study were of follow ups who had visited their physician in person hence telemedicine may play a more important role in close follow-up care [51].

Utilization and Satisfaction with Telemedicine during the COVID-19 Pandemic

During COVID 19 pandemic there was a great risk of getting infected with the virus especially people with low immunity and hence hospital OPDs were dismissed. Patients were dealt with through phone calls [52]. A cross-sectional study was carried out at the telemedicine unit of SZABMU, Islamabad from 26th March 2020 to 26th April 2020. Sample size was 765 patients. Convenient sampling technique was used in a simple randomized manner. Phone calls were used to collect data, prank calls were excluded. An international study showed that 15.3% of patients were satisfied with their telemedicine encounter [53]. A questionnaire having questions regarding demographics, COVID 19 and patient satisfaction was used. The questionnaire was developed according to WHO guidelines of COVID 19. All medical calls were classified into COVID 19 and non-COVID 19 calls. All COVID 19 callers were asked about

their travel history, contact with COVID-19 positive patients, their symptoms e.g. fever, flu, dry cough. The calls were scored according to COVID 19 scoring system and were classified into grades. The patients who scored zero were given reassurance and preventive measures. Category 1 were instructed to stay at home, category 2 were directed to stay isolated at home, category 3 were instructed to get to the COVID 19 center for consultation. The non COVID 19 calls were connected to a specialty of medicine according to their complaint. After all the data was collected, frequency tables and figures were used to analyze it. Total number of callers was 765, 578 (75.6%) were men while 187(24.4%) were women. A mean age of 35.28 +/- 15.521 was seen. The callers were divided into six age groups with 82 (10.7%) being less than 20 years of age, 195 (25.5%) aged between 20 to 30 years, 228 (29.8%) aged between 30-40 years, 120 (15.7%) aged between 40-50 years, 74 (9.7%) aged between 50-60 years, and 66 (8.6%) were past the 6th decade of life. Out of these, 87(11.4%) patients had associated co morbidities. 170 patients were from Islamabad, 243 lived in Rawalpindi, 351 lived elsewhere. 742 callers were satisfied from a single call while 23 called multiple times. 82.92% were COVID 19 calls while 17.07% were others. 429 patients scored zero, 271 were in category 1, 54 category 2 and 4 category 3. General medicine was mostly consulted next was cardiology and ophthalmology was least consulted. Majority of the 737 patients were satisfied with the accessibility and effectiveness of telemedicine. Majority of the calls were related to corona infection and the anxiety related to the pandemic [54-65]. Patient Experience Telemedicine is used when distance is the major obstacle in the treatment. It is a virtual technology due to which we can exchange clinical data, pictures, and patient information in far areas [66,67]. Telemedicine includes electronic devices that are laptops, tablets, and cell phones [68,69]. Before the pandemic, covid 19th use of telemedicine was minimum it was mostly used for respiratory infections that are spread due to droplets transfer but after the global pandemic in 2019, it has been using in a way more than before it has been shown that telemedicine has played a great role in preventing the spread of the covid 19 as it prevented patients to get their treatment without coming in contact with other people. Covid 19 is highly contagious that is spread from breathing near the infected person in close contact; it is spread by coughing and sneezing of the affected person that shows symptoms or may not show [70]. Apart from covid 19 some other people also used telemedicine for their treatment. Apart from this, married patients were less concerned about their privacy than unmarried patients. However, patients with sexual disease and mental health were concerned more about their privacy. People with good socioeconomic status benefited more and were satisfied as they have easy access to internet [71]. Our experience of the first 100 patients the pandemic, covid 19 has burdened the health care system across the globe Different strategies were used to prevent the spread of the diseases by isolating the patient [78,79]. Different hospitals used different methods to prevent the spread of the disease. The main precaution was to isolate the patient at home that prevented the spread of the disease. Telemedicine was used for both consultations and monitoring [80,81]. Researchers from Royal College of Surgeon Ireland (RCSI) feel that the chronic illnesses can be treated through home care and are expected to cost 10% of the inpatient care costs [82]. In the time of pandemic telemedicine can lessen the burden on hospitals, yet patient satisfaction was an issue to address [83].

Tele Health Kids (THK) Program

Developmental disabilities affect 13% of kids under 18 years of age in the United States [55]. Tele Health Kids (THK) program was used in two schools for kids having DD in two rural counties in Northeast Ohio to link children with DD to their own primary care physician's office to attend to their slight illnesses. Each of the schools had a telemedicine workstation with a digital otoscope, telephonic stethoscope, digital camera, and video conference camera. Each of the schools also had a certified telehealth assistant trained to use the equipment. A survey was carried out. Aim was to assess patient care situations where asynchronous telemedicine offered unexpected benefits to the patient and where the asynchronous telemedicine visit provided more productive and better clinical care than a traditional in-office visit [56]. Consent was taken from the parents to enrol their children in THK. Parents were asked in a survey about their understanding, anticipation and worries about telemedicine. Information regarding demographics, healthcare and insurance was taken. Parents were asked about their satisfaction regarding telemedicine after 1 week of their child's first telemedicine visit. The children enrolled in THK had a mean age of 9.2 years (range: 3–21 years). Majority of them were white (96%), and 66% of parents had a high school education or less. Parents reported that annual family income was < $30,000 for 38% of families, $30,000–$49,999 for 32%, and ‡ $50,000 for 28%. Of the children enrolled, 50% had Medicaid, and 45% had private health insurance. The children had many chronic conditions, and some children had multiple chronic conditions. Majority of the parents (96%) were "not at all" aware of telemedicine. At enrollment, parents thought that there would be decreased parental stress, more timely care of their child and reduced travel. Post visit survey showed that most of the parents were satisfied with the care that their child received. 88% thought that the telemedicine was economical. 100% said that they would use telemedicine for their child in future. Technical difficulties in the first few months were the main reason for parents' dissatisfaction. 200 cases were enrolled. One case was of a 14-year-old girl with spastic cerebral palsy. Her family spent a lot of money to transport her from their home since they did not own a specialized vehicle to accommodate her disability. THK has reduced this expense. Another case was of a 10-year-old with multiple chronic health conditions, including heart disease, blindness, and intellectual disability. She was non ambulatory and nonverbal. Her parents were both working and needed to take time off to accompany their child for her health visits. THK helped them to stay at work while their child was taken care of by a familiar nurse. Third case was that of a 16-year-old boy with Down syndrome. His family had to travel 35 miles to reach the physician's office, the kid would get anxious on the way. His family was satisfied with telemedicine visits. This report suggested that some benefits of telemedicine were reduced travel costs and reduced time lost from work. Telemedicine

for rural children with DD might result in additional, more specific benefits for the child, parents, and healthcare providers [57]. These include avoiding the requirement for special equipment or staff during travel, reducing tension for the child and parents, and raising the possibility of successful examinations. A lot of children with DD have limited communication skills; it is hard for parents to decide whether their child's illness needs professional care. Because telemedicine visits were easier to perform, families often asked for telemedicine assessments of symptoms about which they were uncertain. This helped parents to become more certain in their ability to determine how severely ill their child was and whether professional care was needed. Thus telemedicine may be better to in-office care for children with DD [58].

Patient Satisfaction and Future Prospects of Telepsychiatry

Telepsychiatry is a domain of telemedicine where technology is used to provide patient care. Psychiatry is convenient for teleconsultation because patients are assessed through history and demeanour and very little physical examination [59]. This study was an anonymous survey held between April 2020 and September 2020 using Google forms at the Department of psychiatry, Shifa international hospital. This study was done to check the satisfaction of patients availing telepsychiatry consultation during the time of COVID-19. The survey comprised of patients using teleconsultations for the first time. Patients under 18 years of age and those with working diagnosis of psychotic disorders and cognitive disorders were excluded. The questionnaire was sent to patients on their phone numbers immediately after consultation. The questionnaire composed of demographic details, geographical location, University of Washington telemedicine satisfaction questionnaire and questions about time and cost effectiveness. Patient satisfaction was assessed in four domains of tele consultation: audiovisual quality, understanding the advice of doctor, meeting the expectation of patient, politeness and professionalism of doctors and overall standard of consultation. The responses of participants were transported to SPSS for analysis.434 patients were approached, 260 participated in the survey from April 2020 to august 2020 with 60% response rate. Out of 260 participants, 152, (58.5%) were males, 148 (58.3 %) were married and majority (n=157: 60.4%) of patients were <40 years of age. About 62.7% (n=163) were highly educated. Majority (n=108; 41.5%) of the survey participants were from Khyber Pakhtunkhwa province. The average cost saving was Pakistani Rupees (PKR) 3,000 for the consultation while the average time saved was 1.5 days. A review by Naskar S and colleagues showed that telepsychiatry is a cost-effective alternative treatment modality with high satisfaction among patients and also a glimmer of hope for developing countries with immense burden of mental illnesses [60]. About 81.6% of the total survey participants were happy with the way the doctor explained the treatment plan while 2.7% were found to be very unhappy. 79.2% showed happiness with the care they received whereas 2% were very unhappy. 86.2% said that it was very easy for them to talk to the doctor while 88.6% well-understood the advice from the doctor. 90.4% participants were found to be either happy or very happy with audio-visual quality of the consultation. Most respondents (91.7%) were happy with the politeness of the doctor during consultation while 82.8% were happy with overall quality of consultation while 7.6% of the respondents said that they were unhappy with the overall quality of the service. In addition, 80.8% patients were either happy or very happy with the overall standard of the consultation.86.5% of the participants were found to be willing to use the teleconsultation service in future. Out of a total, 198, (76.2%) patients used teleconsultation for the first time [61]. Majority of the patients found teleconsultation convenient, effective, safer, cost effective and time saving. Limitations included paucity of infrastructure, scarcity of internet facility and lack of trained human resources. Majority of patients availing teleconsultations services were using smart phones. The improved connectivity in the form of third and fourth generation (3G & 4G) has enhanced the quality of internet usage over the last 5 years in Pakistan. As of January 2020, nearly 80 million people were using high-speed internet in the country while the number of mobile phone users stood at around 175 million [62]. These statistics of patient satisfaction regarding telepsychiatry prove that it can be used in the future as a treatment modality [63]. Telemedicine uses technology for providing healthcare facilities to people around the globe. Neurological diseases increase with age and provide them with effective prevention and treatments [64]. Telemedicine provides an opportunity to lower the graph of mortality and improve the well-being of the patient. During the time of the pandemic, covid 19 was an efficient way of preventing the spread of diseases as well as treating patients and making their life easy. Studying patients with PD, access to specialists (62%), virtual visits convenience (60%), and time savings (59%) were the top advantages of telemedicine [65]. Apart from the advantages some major concerns were shown across the globes which include lack of internet access in many areas in the low socioeconomic countries, privacy concerns and many more technical problems.

In the rural areas of Pakistan, health facilities are not easily available, especially for women, who are the ones that suffer a lot because they are not allowed to leave their houses. It may be due to their traditional, cultural norms that telemedicine can provide them with all the facilities in their houses. Five medical specialties which are medicine, cardiology, gastroenterology, dermatology, and nephrology use telemedicine [72]. The book has described that telemedicine is used in far areas in a very less ratio because of the lack of internet facilities as well as technical difficulties because internet facilities are not available in far areas. The trust of people in telemedicine is increasing slowly each month. Telemedicine is very useful in natural disasters where patients can't be moved to new localities, and they will be provided the facility wherever they are [72]. The medical records collected from telemedicine can easily be used to keep the records of patients health around the world about 61%of the male and 50% of females in their lives had faced trauma in their childhood that may be as kidnapping terrorism killing wars that cause lifetime trauma [73]. The World Health Organization (WHO) in 2013 reported that an average 3.6% of the world's population suffers from post-traumatic stress disorder (PTSD), with a

distribution of 28.5% in the Western Pacific and 27.4% in Southeast Asia [74]. PTSD is one of the major events that occur after traumatic events in life after losing a loved one or any other mishaps that end in serious diseases or even the death of the person [75]. Telepsychiatry has been very useful in the treatments of elderly and children [76]. Telepsychiatry session that is one a month or more than a month is beneficial even if a session of month is shown beneficial it has provided the same satisfaction as patients and doctor face to face consultations. Simpler forms of telepsychiatry such as through email have also been found to be successful [77]. Similarly to the implementation of new technologies in all other fields, the application of telepsychiatry still faces several limitations that are limited connectivity, lack of human resources and lack of telepsychiatry equipment.

Empowering Disadvantaged Women through Digital Health Literacy Intervention

Telemedicine allows delivery of clinical care between two different geographical areas mainly through phone or video calls [84]. Due to covid-19 pandemic people in remote areas increased the use of telemedicine for orthopaedic surgery consultations [85]. In this study, an online 23 question survey was distributed among patients who received tele-medicine consultations in our institution for musculoskeletal complaints from 17 march to 1 June 2020. The study included questions regarding the bio data of the patients and their view about telemedicine consultation. Responses were viewed on a 5point likert scale. A majority of patients (76.5%) were satisfied and only 19.2% did not want future telemedicine consultations. In a total 1558 patients with an average age of 63.3 years completed the survey. A total of 30.3% of responders presented with new inquiry while 69.7% came for follow-up visit. When comparing follow-up and new patient visits likert scale revealed that patients who presented for follow up consultations and utilized video were most satisfied. Confidence in the fact that a physician came to the correct diagnosis as in office visits increased the satisfaction rate. Telemedicine also reduces the cost by saving the transportation expenses [86,87]. The conclusion was that overall satisfaction rate was higher for orthopaedic patients receiving telemedicine 25% of the world's population lives in south Asia, majority of them are poor with no valuable resources and no proper health coverage. Research shows that 1 in every 20 South Asians face health problems with a greater risk of mortality [88,89]. There is a very essential need for proper planning for primary health services where disease identification, treatment and prevention are possible. Pakistan is the sixth largest country worldwide according to the number of people living there [90]. Research has confirmed that women in the country suffer from a disease burden of communicable diseases, non-communicable diseases, accident, violence, injuries and multimorbidity [91,92]. The aim of this study is to develop a digital health literacy intervention to disadvantaged women in the areas of sanitation and also awareness and prevention of coronavirus. A 3month study will be carried out that includes video tutorials, one on one training for awareness, group training, and one on one training for self-management chart. The participants of the study will be disadvantaged women. The study will have three steps: first baseline data about health challenges faced by the women, second a pretest survey administered to both control and intervention groups and third both groups will be delivered a post-test to assess differences between both groups. A target of 1000 women will be taken, 500 for the control group and 500 for the intervention group. Analysis will be conducted using SPSS version 25. Data regarding refusal and dropout will be reported according to Consolidated Standards of Reporting Trials guidelines [93]. Levels of significance reported at $p<0.05$. A website will be developed for sharing aggregated data. Finally, the study will be published in an international peer reviewed journal. This protocol describes the methods of RCT whose aim is to empower women clients by investigating the effects of digital health literacy.

Attitudes and Utilization of Telemedicine among People in Southern Punjab during the COVID-19 Pandemic:

Delivery of healthcare services by electronic information and communication technology to patients separated by area, time, social and cultural barriers are called tele-health [94]. Telemedicine has a large use in high-risk obstetrics consisting of treatment of gestational diabetes, diagnosis and management of hypertensive pregnancy conditions and fetal malformation screening etc. [95]. Pakistan had the highest maternal mortality rate in South Asia i-e 350 to 500 per 100,000 live births [96]. Gynae and obstetric unit of Farooq hospital Westwood branch conducted an analytical study between 18-5-2021 to 31-12-2021. Through random sampling technique a sample of 108 respondents was taken, 80 belonged to the age group of 25-34 years. For analysis of data SPSS version 23 was utilized and chi square was used for associations between variables fixing p value of less than 0.05. This study concluded that the most common device used for tele-health was smartphone (87%) and the most common barrier was network problems reported by (55%) of respondents. 84.1% of the respondents were satisfied with telehealth services. Significant association was observed with the use of telehealth services and fetal outcome ($p=0.02$). In a similar study that was conducted in 2019 in the US it was revealed that 90.2% of the patients were using tele-health services [97]. Easiness of appointment, patient convenience, and comfort and cost effectiveness were the major advantages of telehealth services.

Covid-19 is a serious infectious respiratory illness caused by SARS COV-2 virus. It has dangerous effects with a high mortality rate especially in patients with preexisting medical conditions [98]. The objective of this study was to evaluate the acceptability, attitude and utilization towards telemedicine among people of Southern Punjab during Covid-19 pandemic. A descriptive cross-sectional study was carried out including 144 subjects aged between 34-58 years who have consulted on telemedicine for different problems in the timeframe between 6 May 2022 to 9 July 2022 [99]. 144 subjects who have consulted telemedicine helpline for cardiology problems 11.1%, dermatology 12.5%, ENT and pulmonology 33.3%, medicine 13.9%, Pediatrics and surgery 8.3% were included in this study. Majority of the patients were satisfied 62.5% and

13.2% were unsatisfied whereas 24.3% patients' satisfaction was neutral. Patient satisfaction rate was also monitored department wise. Patients' satisfaction rate for cardiac diseases was neutral, for dermatology was unsatisfied, for gynaecology and obstetrics and also for surgery the patients were satisfied. Patients' response rate showed that 96.3% patients were satisfied with the care provided for follow-up, side-effects queries showed that 84.6% patients were satisfied, 83.3% patients were satisfied with time, inquiry and dosage of medicine, and 22% were satisfied with anxiety. Overall satisfaction rate was 90%. Telemedicine has become the most essential component of the healthcare system [100].

Patient Satisfaction and Physician Behaviour in a Hospital Setting

With the shift to telemedicine in covid 19 pandemic adolescents have been key consumers of healthcare related to technology [101]. The main purpose of this study was to find out the non-inferiority of tele-health vs. in person visits by comparing acceptability with respect to efficiency, effectiveness, equity, patient centeredness and confidentiality. Early analysis have demonstrated successful adoption of telehealth with high uptake rates for adolescents over a small period [102,103]. A cross-sectional web based survey was carried out to assess attitudes towards tele-health in AYA and parents and caregivers. The 32 item (AYA) and 29 item (caregivers) web based surveys assessed telehealth accessibility and feasibility. Items were selected using a Delphi procedure with medicine, psychology and informatics experts [104]. Proportions of AYA and caregivers who rated tele-health as non-inferior were compared using chi-squared tests. Survey response rates were 20.5% for AYA and 21.8% for caregivers. Most AYA and caregivers rated telehealth as no inferior to in-person visits with respect to confidentiality, communication, medication management, and mental health care. One-quarter of the AYA and 31.7 % of the caregivers reported technical difficulties. Future policies should include privacy, remove technical difficulties and at home method standardization.

In order to better understand how patient contentment affects medical professionals' behavior intentions and the quality of healthcare services provided in a hospital setting, a study was undertaken at the Niazi Welfare Foundation Teaching Hospital in Sargodha. This study examines the critical relationship between patient satisfaction with healthcare services and focuses in particular on the behavior of physicians. It clarifies the particular setting of Pakistan, where this issue has received less attention than in more developed nations. Due to rising economic prosperity in contemporary civilizations and increased public knowledge of health issues, there is an increasing demand for healthcare services in the current global scene. Changing healthcare needs and an altered population towards healthier lives are the results of this increased concern for well-being. Patient satisfaction is crucial in determining how well a healthcare facility is performing, yet many studies have ignored individuals' viewpoints in favour of technical and physiological components of healthcare outcomes [105,106].

Patient satisfaction is a complex indicator of how satisfied a patient is with the medical care they get. It covers a range of aspects of healthcare, including accessibility to services, the skill and friendliness of service providers, the convenience and atmosphere of the healthcare facility, cost-effectiveness, and the efficacy of the treatment itself. A widely used standard for assessing the level of hospital healthcare services is patient satisfaction [107,108].

250 patients from the outpatient unit of the Niazi Welfare Foundation Teaching Hospital in Sargodha participated in the study. Data were gathered using a pre-validated questionnaire, with an emphasis on two major factors: the atmosphere of the hospital and patient satisfaction with the behaviour of the doctors. Interviews were used to gather the data, and SPSS version 23 was used for statistical analysis. Participants' demographic profiles showed a varied sample. 140 men (56%) and 110 women (44%) responded to the findings of the poll. 37 patients (14.8%) were under the age of 20, 83 (33%) were between the ages of 21 and 35,53 (21.2%) were between the ages of 36 and 50, and 77 (30.8%) were beyond the age of 50. There were 145 people with low socioeconomic status (58%) and 105 people with high socioeconomic status (42%) in the sample. With 117 (46.8%) from urban and 133 (53.2%) from rural areas, there was a reasonably equal representation of both. Regarding marital status, there were 81 (32.4%) single respondents and 169 (67.6%) married people. The patients' educational backgrounds were diverse as well, with 180 (72%) being literate and 70 (28%) being illiterate. The majority of respondents expressed satisfaction with how doctors' behaviour was received by patients. For instance, 94% of respondents thought their privacy were protected, 88% said their doctors genuinely listened to their problems, 88% thought their healthcare professionals were professional, and 96% received appropriate management plans. Only 42% of patients, however, stated that they were given recommendations for laboratory tests [108].

Patients' levels of satisfaction with the atmosphere in the hospital varied. Approximately 64% of people were happy with the sitting arrangements, 70% with how clean the outpatient department was, and 68% with how easy it was to get a sip of water. Furthermore, 79% of respondents valued the appropriate signs and arrows for navigation, and 82% said it was convenient to go to the pharmacy. The study emphasizes the critical importance of physician behaviour and the considerable association between healthcare services and patient happiness. Not only is patient happiness an important metric, it also offers a useful indication of the caliber of hospital-based medical care [109].

Patient Experiences and Preferences in Rheumatology Telemedicine during the COVID-19 Pandemic

The focus on a single hospital in Pakistan and the absence of the viewpoint of healthcare providers are two drawbacks of this study that should be noted. To further raise healthcare standards, future research should take into account undertaking comparable studies in both the public and private healthcare sectors. In conclusion, this study offers insightful information about patient happiness and how it affects healthcare services, highlighting the importance of ongoing development to raise the standard of care offered in healthcare facilities. Patient satisfaction is still a crucial component

of healthcare delivery, and this study lays the groundwork for further research in the area [109].

This study focuses on telemedicine in rheumatology done during the Covid-19 epidemic. The study focuses on the beliefs and experiences of clients who used telemedicine to contact rheumatologists remotely. The study's limited sample size makes it difficult to undertake stratification or identify appropriate connections. The study's reliance on patients' memories of their experiences presents the possibility of memory bias to deliver clinical treatment remotely, telemedicine, also known as teleconsultation, uses two-way telecommunications technology. Initially this facility was only used to treat COVID-19 patients [110]. But the nature of the pandemic and emergence of chronic conditions in all fields soon required the use of telemedicine for chronic conditions of many specialties [111,112]. Patients with inflammatory arthritis have substantially benefited from teleconsultation in rheumatology, but there is little information on its utility for connective tissue illnesses [113]. Due to the drug's unavailability during the Covid-19 pandemic, some patients stopped taking hydroxychloroquine. Overall, telemedicine services have been well received, and people want to keep utilizing them even when the pandemic is finished. Rheumatoid arthritis was the most typical condition seen during teleconsultations. The delivery of clinical care for autoimmune rheumatic disorders over distance during the pandemic, however, has not been thoroughly studied. Patients voiced worries about doctors not allocating enough time and the lack of a physical checkup during teleconsultations. Some patients reported trouble hearing, articulating their symptoms clearly, and using phones or computers to conduct teleconsultations. Incorrect medicine prescriptions and the inability to conduct more tests were additional worries. The hospital website or the outpatient clinic was the main sources of information for patients about telemedicine. Due to lengthy wait times, convenience, trouble walking, and concern over infections, teleconsultations were preferred to in-person clinic visits [113]. One more person was needed to help one-third of the patients participate in teleconsultations. When compared to teleconsultations, in-person clinic visits were thought to have the best possibility of a physical examination and direct discussion with the healthcare professional. The study participants' demographic data, rheumatologic diagnosis, and history of Covid-19 sickness were documented. Telemedicine was a safer choice for patient-clinician contact during the pandemic because of the lack of effective treatments, social barriers, and lockdown precautions. Because of their concern about contracting the Covid-19 infection, 25% of the patients deescalated or discontinued their treatment plan. People who wanted teleconsultation services to continue after the pandemic chose a mix of teleconsultations and in-person consultations. Overall, 76% of patients preferred rheumatology teleconsultation to continue after the epidemic. Patients on immunosuppressive therapy benefited most from telemedicine, which decreased their chance of contracting new infections. The study shows how telemedicine has the potential to be a useful and preferred method of providing treatment for rheumatic patients. As a result, this study emphasizes patients' positive perceptions and experiences of telemedicine in rheumatology during the Covid-19 pandemic. It highlights the advantages and drawbacks of teleconsultations and offers information on patient preferences for the provision of healthcare in the future [114].

Telemedicine Service Acceptance Model

The fundamental theoretical foundation for this study, the Technology Acceptance Model (TAM), will be used to build a research model. The use of telemedicine services by people is the special focus, particularly in rural areas of developing nations like Pakistan. The study admits that other social and behavioural aspects that were not considered in the first TAM model play a role in the adoption of telemedicine. The researchers provide a theoretical model dubbed the Telemedicine Service Acceptance model, an extension of TAM, to study the primary elements impacting the acceptance of telemedicine. To better understand the adoption of telemedicine services in underdeveloped nations, this model incorporates new variables in addition to existing TAM characteristics.

The most reputable and substantial basis for technology acceptance is thought to be Davis' Technology Acceptance Model (TAM) [115]. TAM seeks to predict user acceptance of new technologies and identify design flaws before they are used widely [116]. Using TAM as the theoretical framework and a number of other antecedents, the researchers in this study intend to analyze the factors influencing patients' desire to accept telemedicine services. A significant issue is the lack of access to primary health care in rural parts of developing nations like Pakistan [117]. Telemedicine services have the ability to solve this problem by making healthcare more accessible, particularly in rural areas [118]. Despite the potential advantages and the acceptance of telemedicine's dependability and accuracy, it has not yet developed into a crucial component of Pakistan's rural healthcare system. Studies have demonstrated that a variety of social factors, such as social influence and enabling circumstances, can have a big impact on how users behave when it comes to embracing new technology [119,120]. Therefore, it is essential to comprehend the elements affecting the rural population's acceptance of telemedicine services.

The results of this study demonstrate that TAM is applicable when other factors are included to simulate the uptake of telemedicine services in poor nations. According to the research, elements like perceived ease of use, technical anxiety, social influence, perceived usefulness, trust, enabling circumstances, perceived danger, and aversion to technology all have an impact on people's intentions to utilize telemedicine services. It's crucial to examine and comprehend these elements in order to encourage the use of telemedicine services. It is a recurrent pattern that telemedicine technology is not widely used in underdeveloped nations, and more research is required to examine patient attitudes and acceptance of telemedicine services.

This study's findings emphasize the significance of comprehending the variables influencing rural populations in developing nations' acceptance of telemedicine services. Based on TAM, the proposed Telemedicine Service Acceptance Model offers a thorough framework for examining the uptake of telemedicine services.

Policymakers, healthcare professionals, and the government can build viable telemedicine programs in rural areas using the study's findings [121].

Discussion

Over the course of the past few years, the healthcare system has been subjected to significant transformations as a result of the confluence of technical advancements and an increased emphasis on therapy that is oriented on the patient. These modifications have taken place as a consequence of the confluence of these two forces having taken place. At the same time that traditional in-person medical care, which is still widely used, has emerged, telemedicine, which is the practice of providing medical consultations and services remotely, has also emerged. Telemedicine is a relatively new field of medicine. Individuals' altering perspectives on the means by which they acquire access to and make use of healthcare have been the driving force behind this development. This development has been brought about by the increasing prevalence of healthcare.

According to the findings of the study, the individuals who participated in the survey come from a wide variety of various backgrounds and represent a vast variety of different areas and genders. Additionally, the survey participants originate from around the world. As a result of the fact that people who belong to different demographic groups and who live in different geographic regions have distinct preferences and requirements with regard to healthcare, the diversity that happens is a reflection of this fact. When it comes to being able to modify services in order to fulfill the specific requirements of a community that is diverse, it is extremely necessary for persons who work in healthcare and those who hold legislative positions to have a solid understanding of this variation. An examination of the two in terms of the experiences that patients have with traditional in-person healthcare and telemedicine can provide us with a great deal of information regarding the advantages and disadvantages of both traditional and telemedicine-based healthcare [122]. According to the data, respondents said that they found both in-person treatment and telemedicine to be equivalently gratifying. The fact that this was demonstrated by taking into account the entire enjoyment those individuals had been demonstrated. This leads one to the conclusion that patients are generally satisfied with their experiences throughout their journeys through the healthcare system, regardless of the type of consultation that they go through. Author found that there is a significant relationship found between variables [123].

On a similar note, when it comes to the quality of technology, there was no discernible difference between the conventional in-person treatment and the telemedicine that was used. As far as the healthcare industry is concerned, the fact that patients are provided with treatment that is not only adequate but also precise is a demonstration of the fact that all methods of delivery are equally effective and successful. Evaluations of the interpersonal interactions and communication that took place between patients and healthcare personnel were found to provide consistent results; literature has also confirmed the similar findings [124]. These evaluations were carried out. This was obtained through the process of analysing the data that was collected. The fact that patients' experiences with telemedicine and in-person consultations were equivalent in terms of happiness and success lends credence to the notion that telemedicine has the potential to facilitate interactions between patients and physicians that are not only pleasurable but also advantageous. The amounts of money that patients reported spending with the physician as well as the length of time that they said they spent with the physician were both clearly different from one another. On the other hand, there were clear variations in both of these aspects. As a result of the fact that patients viewed telemedicine as a more cost-effective option to conventional in-person medical treatment, it is possible that consultations that are carried out over the internet can result in cost savings [125]. In addition, it was discovered that in-person consultations tended to provide a somewhat higher length of perceived time with the physician in contrast to telemedicine sessions, despite the fact that the difference between the two was minor. The fact that this is the case suggests that there is a potential way in which telemedicine could be improved in order to provide patients with the impression that they are receiving a great lot of attention and participation during the course of their virtual consultations. It is possible to achieve this goal by enhancing the manner in which telemedicine applications are supplied. It was precisely the same as receiving healthcare in person in terms of ease and comfort when it came to telemedicine, which allowed for access to healthcare services. Both of them were very similar to one another in every respect [126]. The findings that were achieved from both methods were comparable to one another. The data evidence suggests that an increasing number of individuals are embracing a hybrid healthcare usage paradigm with their healthcare utilization. At some point in their life, a considerable proportion of individuals have utilized both in-person and remote medical consultations. This is a common practice that has been utilized by a significant number of individuals [127]. The concept of a pragmatic approach, in which individuals make use of a range of modalities according to considerations such as the specifics of their healthcare requirements, the urgency of the issue, and the method that is most comfortable for them to employ, is given more credibility as a result of this. As a result of a sophisticated understanding of many options to the delivery of healthcare as well as a readiness to take advantage of those alternatives, this hybrid model has experienced a stratospheric surge in popularity. The manner in which individuals were educated, or the manner in which they were instructed, has a considerable impact on the attitudes and decisions that individuals make with regard to medical treatment [128]. The information that has been provided here makes it abundantly evident that the respondents came from a diverse variety of educational backgrounds, with a large portion of them falling into the categories of undergraduates and graduates. It is essential to acquire education in order to widen one's awareness and comprehension of healthcare services that are offered remotely. This is highlighted by the fact that the majority of respondents had previous experience with telemedicine [129]. Putting an emphasis on the fact that this is the situation is of the utmost significance. Although this is the case, the fact that there is a population that is not familiar with telemedicine demonstrates how essential it is to continue carrying out educa-

tional initiatives in order to close the knowledge gap that currently exists. These ever-changing preferences, which are disclosed by the data, have the potential to impact a wide range of different areas of the delivery of healthcare. It is possible that this is the case [129-131]. To be able to adjust to this new reality, healthcare organizations need to be able to provide solutions that are adaptable and integrate conventional in-person therapy with cutting-edge telemedicine. Only then will they be able to adapt. While this shift takes into account the numerous options that are available to patients, it is of the utmost significance that the accessibility and efficiency of healthcare services be preserved despite the fact that this change is being implemented [132].

The findings indicate that individuals are becoming more receptive to the utilization of telemedicine, which is a positive indicator for the field of healthcare technology as a whole. This is a favorable indicator for the sector as a whole. Consequently, as a result of this, healthcare providers have the opportunity to make investments in and modifications to the infrastructure that is accountable for the delivery of healthcare in remote places. Increasing the efficiency of healthcare delivery and improving accessibility are both potential goals that can be accomplished through the introduction and enhancement of telemedicine, particularly in regions that are underserved or rural. Telemedicine can be used to accomplish both of these goals. Both of these aims are attainable through the utilization of telemedicine. The findings of the study indicate that when it comes to healthcare, a dynamic environment is characterized by the presence of both classic and contemporary treatment techniques. The reason for this is due to the interaction that takes place between the two [130]. Taking into consideration the growing prevalence of telemedicine, the growing popularity of hybrid healthcare, and the diverse spectrum of groups that are represented, it is of the utmost importance to develop a healthcare system that is more adaptable and inclusive. To ensure the continued success of the healthcare industry in the years to come, it is imperative that a solution be discovered that strikes a balance between the utilization of new technology and the implementation of more conventional methods of treatment. This will allow the healthcare system to continue to priorities the needs of patients and to adjust its services to meet the diversified requirements of a growing population. This will allow the system to continue to fulfill the needs of an expanding population. It is likely that if we make use of these insights, we will be able to develop future healthcare policies that are not just forward-thinking but also respectful of the requirements and preferences of the people that we are seeking to help. This would be a significant achievement [131].

Conclusion

Telemedicine in Pakistan has emerged as a transformative tool with the potential to overcome longstanding barriers to healthcare access, particularly in remote and underserved areas. This review highlights that telemedicine, facilitated through various technologies like smartphones and remote monitoring, offers significant advantages such as convenience, cost savings, and enhanced patient satisfaction. Despite historical challenges related to technology and infrastructure, recent advancements in information and communication technologies (ICT), coupled with increased mobile internet penetration and supportive governmental initiatives, have accelerated telemedicine adoption, especially catalyzed by the COVID-19 pandemic. However, challenges such as privacy concerns, technological literacy, and the preservation of doctor-patient relationships remain significant hurdles. Studies across different medical specialties in Pakistan consistently underscore high levels of patient satisfaction with telemedicine, despite issues like unstable internet connectivity and limited physical examinations. Moving forward, the successful integration of telemedicine into Pakistan's healthcare system requires robust policy development, improved technological infrastructure, and comprehensive stakeholder engagement to ensure equitable access and quality of care. By leveraging lessons learned and addressing existing challenges, telemedicine holds promise to significantly enhance healthcare delivery in Pakistan, bridging gaps in access and improving health outcomes nationwide.

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