(January 2025). EVALUATING THE ADOPTION AND CHALLENGES OF TELEHEALTH IN ASSAM
***International Journal of Economic Perspectives*, *19*(01) 56-66**
ISSN: 1307-1637 UGC CARE GROUP II
Retrieved from https://ijeponline.com/index.php/journal

EVALUATING THE ADOPTION AND CHALLENGES OF TELEHEALTH IN ASSAM

Priyanka Borah[1*], Dr. Rajiya Shahani [2]

[*1]Ph.D. Scholar,
Department of Sociology,
Assam University, Silchar, India
Email: priyankasocio1996@gmail.com

[2]Assistant Professor,
Department of Sociology, Assam University, Silchar, India

ABSTRACT

Telehealth has emerged as a crucial component of healthcare delivery, particularly in regions with limited access to medical facilities. This study examines the adoption and challenges of telehealth services in Assam, with a particular emphasis on the Kamrup and Cachar districts. Both primary and secondary data have been used in this study. The main objectives are firstly, to assess the usage patterns of telehealth services in Assam. Secondly, to examine the barriers faced by people in accessing telehealth services. The research is exploratory in nature. The methods of data collection include interviews and observations. The total number of respondents is 400. The findings reveal that the main factors influencing the adoption of telehealth include accessibility, digital literacy, and infrastructure limitations. While telehealth has improved healthcare access, particularly during the COVID-19 pandemic, significant barriers remain, such as a lack of awareness, technological constraints, and inadequate digital infrastructure in rural areas.

Keywords: ***Telehealth, Digital Healthcare, Digital Divide, Telemedicine,***

Introduction

Telehealth is cutting-edge paradigm in the health domain. It is a practice that can provide health care, health education, health training, and health counselling to a large section of society via digital technology. It reduces the gap between demand and supply of health care services in terms of cost-effective and easy accessibility to the treatment of disease. This telehealth practice can offer quality healthcare to a large population. Notwithstanding, When the technology is introduced, the existing structures such as social, cultural, economic, political, or biological aspects are affected. No technology is inherently neutral; however, when technology is used to exert control over the human body, it introduces complexity within a given society.

"Telehealth involves the use of telecommunications and virtual technology to deliver health care outside of traditional health-care facilities. Telehealth, which requires access only to telecommunications, is the most basic element of e-health, which uses a wider range of information and communication technologies (ICTs)." (WHO, 2010)

The term telehealth usually refers to a wide array of management and diagnostic techniques, educational programs, and health-related allied activities. It also incorporates nonclinical aspects like appointments, ongoing education for healthcare providers, and training for health professionals. (https://www.cchpca.org/about/about-telehealth)

The origins of telehealth trace back to the 20th century, with the University of Nebraska pioneering its application in 1959 by conducting video-based neurological consultations. The National Aeronautics and Space Administration (NASA) played a significant role in advancing telehealth,

Submitted: 27Oct 2024, Revised: 09 Nov 2024, Accepted: 18 Nov 2024, Published: Jan 2025

deploying its services during major disasters such as the 1985 Mexico earthquake and the 1988 Soviet Armenia earthquake. In 1997, NASA further expanded its contributions by establishing a telemedicine center at Yale University (Chellaiyan, Nirupama, & Taneja, 2019).

By March 31, 2022, India had established 157,935 Sub Centres (SCs) across rural landscapes and 3,894 SCs in urban environments. Furthermore, 24,935 Primary Health Centres (PHCs) were functional in rural areas, while 6,118 PHCs catered to urban populations. In terms of advanced care, 5,480 Community Health Centres (CHCs) operated in rural sectors, with an additional 584 CHCs in urban areas.

In the contemporary healthcare landscape, telehealth has been widely adopted across different countries, integrating devices like smart phones, laptops, and computers. With a vast selection of over 325,000 health applications, virtual healthcare solutions are continuously improving. The COVID-19 crisis has further emphasized telehealth's significance in limiting in-person interactions while optimizing medical records management and diagnostic accuracy.

Telehealth in India is yet to be explored. Hence, it extends our knowledge of telehealth. It will also help the government with future policy implementation. A small portion of the researcher is concerned with telehealth and there is a lack of comparative and sociological studies towards telehealth. It focuses on how people react to new interventions and explanations about virtual medical care. It also helps us to policy implications and improves policy on telehealth. It tends to focus on understanding the conceptual and analytical notions of the digital divide and new health interventions.

In India, a considerable portion of the population resides in rural areas, where healthcare accessibility remains a persistent challenge due to inadequate infrastructure, a deficient medical workforce, and poor transportation and communication systems. These limitations severely restrict the provision of essential healthcare services. Moreover, a significant number of medical professionals are reluctant to work in remote and underserved regions, intensifying inequalities in access to healthcare services. With a doctor-to-patient ratio of just 0.62:1000, India significantly lags behind the World Health Organization's recommended benchmark of 1:1000.

With nearly 70% of India's population living in rural areas, where underdeveloped transport networks and geographical remoteness pose extra difficulties making timely medical attention remains a critical issue. The COVID-19 pandemic has magnified these difficulties and increasing the adoption of virtual health solutions. In response, telemedicine has become an essential tool in bridging the healthcare gap which facilitates remote consultations and increasing access to medical expertise. A particularly significant aspect of telemedicine is online mental health counseling, which has played a crucial role in the psychological distress arising from prolonged isolation, social distancing measures, and the widespread uncertainty brought on by the pandemic.

Beyond medical consultations, telehealth has played a vital role in promoting public health programs. The government's implementation of automated COVID-19 caller tunes on mobile networks has served as an effective strategy for disseminating preventive health measures to a broad audience. In addition, telehealth platforms have streamlined healthcare delivery through remote medication distribution, digital vaccine registration, and online appointment scheduling. The adoption of virtual healthcare solutions has strengthened public health systems. It has also helped minimize disease transmission, increasing the healthcare sector's ability to withstand unforeseen challenges.

Review of Literature:

Submitted: 27Oct 2024, Revised: 09 Nov 2024, Accepted: 18 Nov 2024, Published: Jan 2025

Robert H.W. (2002) analyzed the role of ICT tools from a developmental perspective, focusing on technology regimes and the occurrence of the digital divide in Western countries. The author emphasized that the digital divide represents a significant force which contributes to global economic inequality. However, this gap can be reduced by increasing the availability of ICT resources in developing nations.

Amanda K. Hall & et al.(2014) studied that health information technology helps to improve quality healthcare services, by using health information from the internet or digital health technologies. The total participants of this study are-225 and a cross-sectional survey has been used to understand the digital divide among the older people who are users along with non-users.the multivariate, bivariate analysis employed in this research.

Richard E, Scott & et al. (2002) pointed out that telehealth could fill the gap between local and international health care. In this study, they have used 102 main questions and 101 sub- questions from 236 countries of the world. The main research areas are--- country data, telehealth, technology, healthcare settings, and evaluative settings. They stated that e-health is the convergence in health care settings and the central meeting point for policy issues and the health infrastructure of a particular region. They have identified some policy issues in telehealth. These are—1.Ethical issues 2. Communication issues, 3. Legal issues.

Jami L. DelliFraine and K. H. Dansjky (2008**)** reviewed home-based telehealth as slightly similar to traditional health care visits. They have used Cohen‘s standardized mean difference, SPSS. 154 articles & dissertations are the main source of their study. They have found that the most common disease-diabetes, heart & psychiatric. Meta-analysis is also included in this research work. A z-test is done for meta-analysis. They found that most of the meta-analyses were done only with adults and the most important medium of this health service is telehealth.

Min-Huei Hsu & et al. (2009) explored that in Taiwan, telehealth practices have three models:1) the home care,2) residential care, and 3) community care. Their telehealth system largely focused on the aged population. They have used functional models on a long-term basis.

R, Raman, S. Mahajan & et al. (2011) discussed the efficacy of the Telehealth program for diabetic retinopathy and the grading agreement between digital frauds. They stated that future studies should compare the results with the gold standard, namely ETDRS stereo, seven-field, film photography, et cetera.

Larry F. Beutler & et al. (2011) studied that psychotherapy helps to increase the importance of telehealth. They try to look at the interrelations between technology, virtual reality and the health domain. An interaction between patient-treatment or patients and doctor is very important.

Shazia Kareem and Imran S. Bajwa (2011) investigated that in virtual telehealth practice, there are two types of telehealth: one in real-time and another one in store-and-forward. The author focused on the following aspects--patient registration, recording of data, processing of report, diagnosis and medication, medical explanation module, and algorithms will be needed for future study in virtual telehealth.

Ramesh N& et al. (2013) examined attitudes and knowledge in dental practices. The total participants of this study are 105 dentists and a cross-sectional survey has been used. A structured questionnaire was used to know about their attitudes and knowledge. For data analysis, multiple linear regression,

Submitted: 27Oct 2024, Revised: 09 Nov 2024, Accepted: 18 Nov 2024, Published: Jan 2025

t-test, and variance were used. The study reveals that there is an unbalanced knowledge of teledentistry and there is a need for social awareness to remove those gaps.

A. Pal and et al. (2005) asserted that why telemedicine is needed in India. The main reason is geographical location. Most of the people live in remote areas. Secondly, the population is very high in India. Thirdly, 80 percent of people live in rural areas. They also talk about the infrastructure of telemedicine in India.

Benedict Stanberry (2006) studied the responsibilities of health professionals, privacy, and confidentiality of the patient's information; funding & policy-related matters; and jurisdiction issues associated with telemedicine. It provides confidential health services through health professionals. The patient's identity is not disclosed publicly. Health professionals also have some responsibility to provide quality diagnoses. Lack of diagnosis can be a drawback of this system. The author also talks about intellectual property rights. For instance, design rights, patents, registered designs, trademarks, copyright etc.

Objective of the Study:

The main objective of the study is as follows:

I. To assess the usage patterns of telehealth services in Assam.

II. To examine the barriers faced by people in accessing telehealth services.

Methodology

This study employs an exploratory research design and utilizes a mixed-methods approach to assess the usage patterns and challenges of telehealth in Assam, focusing on both Kamrup and Cachar districts. Both primary and secondary data have been used. Primary data were collected through interviews and observations, while secondary data were obtained from books, articles, newspapers, and other sources. Multistage and purposive sampling methods were adopted, with a total sample size of 400. An interview schedule and checklist were used for data collection, and SPSS was employed for data analysis.

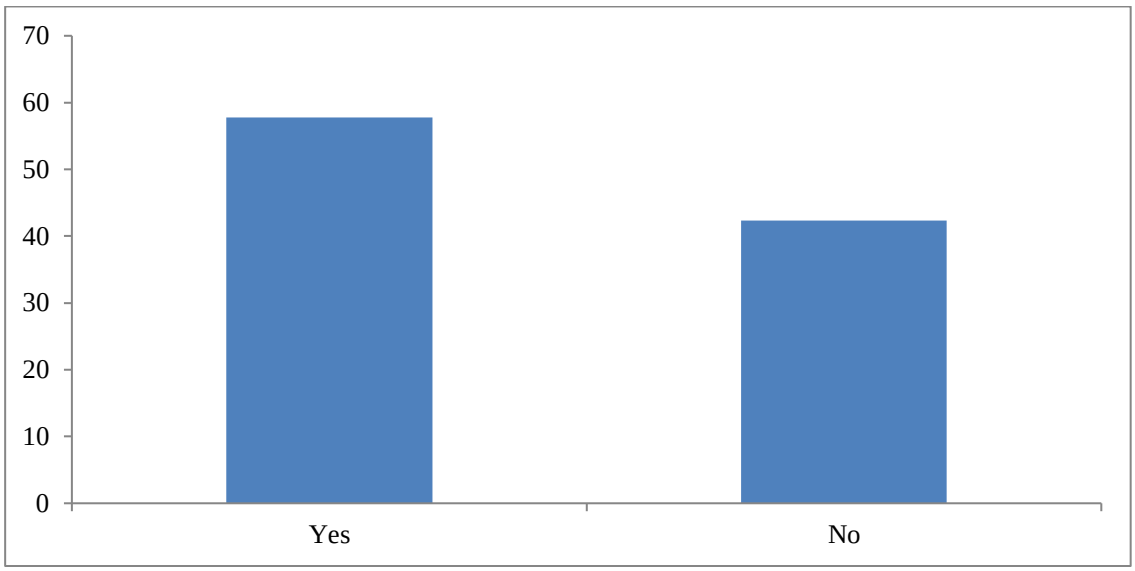
Findings and Discussion:

Usage patterns of telehealth services in Assam:

Telehealth has emerged as a transformative approach to healthcare delivery, utilizing digital communication technologies to provide medical services remotely. Telehealth has proven particularly beneficial in rural and underserved areas, where healthcare access is limited. It enhances patient convenience, reduces travel costs, and allows for continuous monitoring of chronic conditions.

Figure 1 *Familiar with the Concept of Telehealth*

Submitted: 27Oct 2024, Revised: 09 Nov 2024, Accepted: 18 Nov 2024, Published: Jan 2025



Source: *Field Survey*

The findings reveal that 57.8 percent of participants (231 out of 400) are familiar of the concept of telehealth, while 42.3 percent (169 out of 400) are unfamiliar with it. This indicates that although telehealth awareness is relatively high, there's still a significant portion of the population that needs to be reached through targeted informational campaigns to bridge the gap.

Table 1 *Distribution of Respondents' Telehealth Service Usage*

Types of telehealth services	**Frequency**	**Percentage**
N/A	196	49.0
Video consultations with doctors	40	10.0
Phone consultations with doctors	132	33.0
Online prescription services	17	4.3
Mental health counselling	7	1.8
Remote monitoring of health conditions	8	2.0
Total	400	100.0

Source: *Field Survey*

The above table shows the different types of telehealth services used by respondents. Out of the 400 respondents, nearly half 196 respondents do not use telehealth at all. Among those who do use telehealth, 33 percent of the respondents use phone consultations with doctors, 10 percent of the respondents use video consultations, and 4.3 percent of the respondents use online prescription services and prefer ordering their medications digitally instead of visiting a pharmacy or clinic. Mental health counselling through telehealth is used by only 7 respondents and remote monitoring of health conditions, such as tracking vital signs or chronic diseases through digital devices, is used by

Submitted: 27Oct 2024, Revised: 09 Nov 2024, Accepted: 18 Nov 2024, Published: Jan 2025

just 2 percent of the respondents, likely because this service requires specific medical tools and support.

Table 2 *Primary Reasons for Using Telehealth*

Reasons	Frequency	Percentage
N/A	196	49.0
Convenience	79	19.8
Lack of nearby healthcare facilities	27	6.8
Urgent medical advice	25	6.3
Follow-up consultation	61	15.3
Other	12	3.0
Total	400	100.0

Source: *Field Survey*

The table indicates that the distribution of respondents by their primary reasons for using telehealth. Among those who do use telehealth, the most common reason is convenience, with 79 respondents (19.8%) citing it as their primary motivation. Another notable reason for using telehealth is follow-up consultations, reported by 15.3 percent of the respondents, 6.8 percent turn to telehealth due to a lack of nearby healthcare facilities, showing that some individuals rely on telemedicine as their only accessible healthcare option. Urgent medical advice is another reason, cited by 6.3 percent of respondents and lastly, 3.0 percent selected other reasons such as curiosity, influence of friends, and personal reasons.

Table 3 Distribution of Respondents Based on Telehealth Experience (N=204)
(Percentage in Parentheses)

Factors	Excellent	Good	Average	Poor	Very poor	Total
Quality of the Portal / Platform	40 (19.6)	72 (35.3)	55(27)	25(12.3)	12(5.8)	204
Personal comfort	42 (20.6)	70 (34.3)	52 (25.5)	28 (13.7)	12 (5.9)	204
Explanation of Treatment by Staff/Doctor	45 (22.1)	74 (36.3)	50 (24.5)	23 (11.3)	12 (5.9)	204

Submitted: 27Oct 2024, Revised: 09 Nov 2024, Accepted: 18 Nov 2024, Published: Jan 2025

Respect, Sensitivity, and Friendliness of the staff/ Doctor	50 (24.5)	70 (34.3)	45 (22.1)	25 (12.3)	14 (6.8)	204
Overall Treatment Experience	48 (23.5)	72 (35.3)	50 (24.5)	22 (10.8)	12 (5.9)	204

Source: *Field Survey*

The above data shows the experiences of respondents while using telehealth services. While asking about the quality of the platform they used it is found that majority of the respondent have rated in good and excellent. 19. 6 percent rated the portal as excellent , 35.3 percent rated as good , 27 percent rated as average , 12.3 respondents rated as poor and 5.8 rated very poor.

In respect of the personal comfort like communication, privacy and familiarity with the technology it is found that, 20.6 percent felt excellent comfort , 34.3 percent of the respondents rated as good , 25.5 percent rated as average , 13.7 rated poor and 5.9 percent of the respondents rated as very poor.

In case of experience of the respondents regarding the clarity of explaining the treatment, medication and diagnosis by the medical staff it is found that, 22.1 percent respondents felt excellent, 36.3 percent rated as good, 24.5 percent rated as average, 11.3 percent rated as poor and 5.9 rated as very poor.

In the case of respect, sensitivity, friendliness how the medical staff treated the respondents it is found that most of the respondents 24.5 and 34.3 rated excellent and good, 22.1 percent respondents rated as average , 12.3 percent rated as poor and 6.8 percent has rated as very poor while treating them.

The overall treatment experience varied among respondents, with 23.5 percent rating it as excellent and 35.3 percent considering it good. Meanwhile, 24.5 percent of individuals described their experience as average, whereas 10.8 percent found it to be poor. A smaller proportion, 5.9 percent, rated the treatment experience as very poor.

Barriers to Telehealth Accessibility

Telehealth is transforming healthcare access, particularly in remote areas of India. Daily thousands of people are using video calls and consultations through private and government initiatives. However, the telehealth services have multiple challenges. The expansion of telehealth in rural areas comes with several challenges that make its adoption difficult. Many people find telemedicine complicated and feel unsure about using it, especially those who are not familiar with the technology. This lack of confidence can cause anxiety, making them reluctant to try telehealth services. In some cases, certain medical fields, like geriatrics, face additional difficulties since many older adults are not used to digital tools and may struggle to adapt to virtual healthcare. A major issue is the lack of necessary infrastructure, as many rural areas do not have reliable internet access or the technology required for telehealth to work effectively. The gap in digital access further Intensifies the challenge, as a large number of people in rural communities do not own Smartphone's, or computers, or has stable internet connections, making it nearly impossible for them to benefit from online healthcare services.

Submitted: 27Oct 2024, Revised: 09 Nov 2024, Accepted: 18 Nov 2024, Published: Jan 2025

Another major concern is the reimbursement of telehealth services. Healthcare providers may not be paid for some of the services they offer remotely, which discourages them from investing time and effort into telemedicine. Moreover, improving telehealth services requires constant effort, long working hours, and strong motivation, which may be difficult to sustain in areas with limited resources. Legal and ethical concerns also play a significant role in slowing down telehealth adoption. Ensuring patient privacy, keeping health records secure, and following data protection regulations are essential but can be challenging to manage.

Technology access disparities exist, as lower-income face difficulties in accessing reliable internet, smart phones, or computers, reducing their ability to complete telehealth visits. Billing and payment barriers add another layer of complexity, as uninsured adolescents may have to bear high costs for SHS services, while those with private insurance may have co-pays or partial service coverage, risking financial strain or confidentiality breaches. These challenges emphasize the need for sustainable solutions to ensure equitable and effective telehealth services.

Table 4 *Distribution of Respondents by the Challenges Encountered While Using Telehealth Platforms*

Challenges encounter	**Frequency**	**Percentage**
N/A	196	49.0
Poor internet connectivity	47	11.8
Lack of awareness about available services	37	9.3
Difficulty in finding suitable telehealth platforms	29	7.3
Concerns about data privacy and security	7	1.8
Limited availability of specialists	63	15.8
Language barriers	15	3.8
Technical difficulties	6	1.5
Total	400	100.0

Source: *Field Survey*

The table presents the distribution of respondents based on the challenges they face while using telehealth platforms. Among those who do use telehealth, poor internet connectivity is a common issue, with 11.8 percent of respondents reporting difficulties in accessing stable and reliable connections. This is a major concern, especially in rural areas where internet infrastructure is often weak, 9.3 percent of the respondents reported challenge is the lack of awareness about available telehealth services. Finding a suitable telehealth platform is another challenge reported by 7.3 percent of the respondents. Concerns about data privacy and security are raised by 1.8 percent of respondents. The limited availability of specialists is a notable challenge, with 15.8 percent of respondents expressing difficulty in finding the right doctors or medical professionals through telehealth platforms.

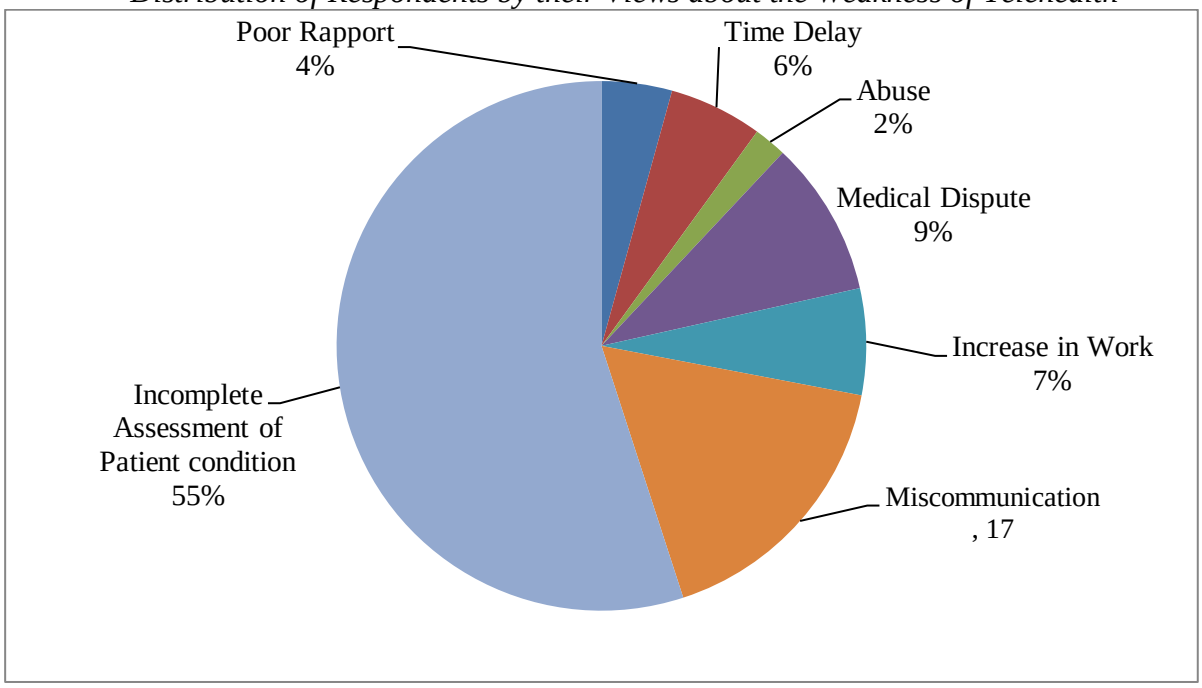
Language barriers also play a role in limiting access to telehealth, particularly for those who are not comfortable with the language used on digital platforms. It is found that 3.8 percent of the respondents faced challenges due to language issues while interacting and 1.5 percent of the

Submitted: 27Oct 2024, Revised: 09 Nov 2024, Accepted: 18 Nov 2024, Published: Jan 2025

respondents reported facing technical difficulties, which may include trouble using telehealth apps, logging in, or exploring digital interfaces.

Figure: 2

Distribution of Respondents by their Views about the Weakness of Telehealth



Source: Field Survey

The above figure shows the distribution of respondent views on the weaknesses of telehealth. The majority of the respondents 55 percent pointed out that Incomplete Assessment of Patient condition is the main weakness of telehealth, and 17 percent of respondents think that miscommunication is a weakness. The lack of face-to-face interaction in telehealth communication can bring misunderstandings between patients and healthcare professionals. Medical disputes are reported by 9.5 percent of respondents as a weakness as they think that without proper physical examination it can cause over diagnoses and deviate treatment plans, Concerns about an increase in workload were noted by 6.5 percent of respondents. Time delays in response to their calls were reported by 5.7 percent of the respondents Poor rapport between patients and healthcare providers was mentioned by 4.3 percent of respondents, and lastly, abuse was cited by 2 percent of the respondents.

Table 5 *Distribution of Respondents by Privacy Concerns in Telehealth*

Submitted: 27Oct 2024, Revised: 09 Nov 2024, Accepted: 18 Nov 2024, Published: Jan 2025

Privacy Concerns	Frequency	Percentage
No privacy concerns	196	49
Concerns about data security and hacking	60	15
Lack of private space for telehealth visits	50	12
Fear of personal data misuse	55	13.8
Difficulty in verifying provider identity	30	7.5
Uncertain about the telehealth platform's security	9	2.2
Total	400	100

Source: *Field Survey*

The above table indicates that privacy concerns arise as many adolescents lack private spaces in their homes to discuss specific health issues. For instance, telehealth services for adolescents Sexual Health Services (SHS) face multiple challenges. Confidentiality risk persists due to on-camera views of their body and billing that may notify their parents.

It is found that 49 percent of the respondents have no privacy concerns, 15 percent of the respondents are concern about data security and hacking, 12 percent of the respondents doesn't have private space for telehealth visits hence, they are unable to discuss their health issues openly, 13.8 percent of the respondents are concern about personal data misuse , 7.5 percent find it difficult to identify their providers identity and 2.2 percent respondents are uncertain about the telehealth platforms security.

CONCLUSION:

In a nutshell, the study explores both the potential and the limitations of digital healthcare services in the region. The findings suggest that telehealth has significantly improved healthcare accessibility, particularly for individuals in remote and marginalised areas. The adoption of telehealth services has been influenced by factors such as digital literacy, availability of internet connectivity, and infrastructural support. The COVID-19 pandemic further accelerated the acceptance of telehealth as an essential healthcare delivery model.

However, several barriers hinder the effective implementation of telehealth in Assam. A lack of awareness, inadequate digital infrastructure, and the digital divide between urban and rural populations remain key challenges. Many healthcare providers and patients face technological constraints, including limited access to smart phones and the internet, as well as a lack of familiarity with telehealth platforms. Furthermore, concerns about data privacy, regulatory issues, and the quality of remote consultations need to be addressed to enhance trust in telehealth services.

To reduce these inequalities, government initiatives must focus on improving digital infrastructure, increasing awareness through educational campaigns, and training healthcare providers in telehealth practices. In addition, policies promoting subsidized access to telehealth technologies for marginalized populations can enhance digital healthcare inclusion. In conclusion, while telehealth presents a promising solution to Assam's healthcare accessibility issues, its success depends on infrastructural, technological, and awareness-related challenges.

Submitted: 27Oct 2024, Revised: 09 Nov 2024, Accepted: 18 Nov 2024, Published: Jan 2025

REFERENCES:

Hall, A. K., Bernhardt, J. M., Dodd, V., & Vollrath, M. W. (2015). The digital health divide: Evaluating online health information access and use among older adults. *Health Education & Behavior, 42*(2), 202–209.

Billari, F., Rotondi, V., & Trinitapoli, J. (2020). Mobile phones, digital inequality, and fertility: Longitudinal evidence from Malawi. *Demographic Research, 42,* 1057–1096. https://doi.org/10.4054/demres.2020.42.37

DelliFraine, J. L., & Dansky, K. H. (2008). Home-based telehealth: A review and meta-analysis. *Journal of Telemedicine and Telecare, 14*(2), 62–66. https://doi.org/10.1258/jtt.2007.070709

Hsu, M., Chu, T., Yen, J., Chiu, W., Yeh, G., Chen, T., Sung, Y., Hsiao, J., & Li, Y. (2010). Development and implementation of a national telehealth project for long-term care: A preliminary study. *Computer Methods and Programs in Biomedicine, 97*(3), 286–292. https://doi.org/10.1016/j.cmpb.2009.12.008

Kadhim, K. T., Alsahlany, A. M., Wadi, S. M., & Kadhum, H. T. (2020). An overview of patient's health status monitoring system based on internet of things (IoT). *Wireless Personal Communications, 114*(3), 2235–2262. https://doi.org/10.1007/s11277-020-07474-0

Pal, A., Mbarika, V., Cobb-Payton, F., Datta, P., & McCoy, S. (2005). Telemedicine diffusion in a developing country: The case of India. *IEEE Transactions on Information Technology in Biomedicine, 9*(1), 59–65. https://doi.org/10.1109/TITB.2004.842410

Ramezani, E., & Rostami, S. M. H. (2019). Fast terminal sliding-mode control with an integral filter applied to a longitudinal axis of flying vehicles. *Journal of Computational and Theoretical Nanoscience, 16*(8), 3141–3153. https://doi.org/10.1166/jctn.2019.8361

Stanberry, B. (2006). Legal and ethical aspects of telemedicine. *Journal of Telemedicine and Telecare, 12*(4), 166–175. https://doi.org/10.1258/135763306777488825

Submitted: 27Oct 2024, Revised: 09 Nov 2024, Accepted: 18 Nov 2024, Published: Jan 2025