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Mini Review

A Study on Sustainable Business Growth of Private Telemedicine Businesses in India

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Abstract

This project aims to use the Health Belief Model (HBM) as a foundation to identify the crucial variables that influence the adoption of *paid telemedicine* services by individuals who reside in India and have access to *mobile health*. 355 individuals participated in a survey with 30 questions as part of the research to collect information.

The statistical analysis of the gathered data was done using exploratory factor analysis. The study revealed that individuals who felt more positively about using technology (ATT) had higher behavioral intent to use paid telemedicine. Individuals who valued using *paid telemedicine* more had higher perceived benefits (PBs). The findings also showed no significant association between increased Perceived Disease Threats (PDT), the severity and susceptibility of a condition, and an individual's willingness to use telemedicine. Individuals with higher PBTAs (perceived barriers to action) demonstrated less enthusiasm for *paid telemedicine* use; higher PBTAs (perceived barriers to action) demonstrated less enthusiasm for using *paid telemedicine*. Individuals with more positive attitudes towards telemedicine also showed more cues to internal and external action.

Introduction

India, like many countries worldwide, witnessed a sharp rise in teleconsultations during the COVID-19 pandemic, leading to exponential growth in related startups. Telemedicine services increased by nearly 33% over the past two years [1,2]. However, by 2022, some companies began pivoting or shutting down their telemedicine units entirely—Amazon, for instance, discontinued its telemedicine division.

An insightful study by Meghani, Das, and Hariyani [3] reveals that most private execution partners involved in government-run telemedicine initiatives struggle to achieve profitability. Nonetheless, these government-backed programs attract more consultations than direct-to-consumer enterprises. This suggests that telemedicine has gained greater acceptance among underserved communities than among urban or mobile populations who must pay for such services.

These findings present an opportunity to further evaluate the structural and economic dynamics shaping telemedicine adoption in India.

Telemedicine and its history

Telemedicine refers to the delivery of healthcare services remotely via information and communication technologies, particularly where distance is a barrier. Its roots trace back to the early 20th century, beginning with the transmission of electrocardiograms in 1905 by Willem Einthoven in the Netherlands. In the 1940s, radiographic images were sent between cities in Pennsylvania via telephone lines, marking one of the earliest uses of electronic medical record transfer.

In 1959, clinicians at the University of Nebraska pioneered two-way video communication for transmitting neurological examinations and other medical information—considered the first real-time video telemedicine application [4]. The technology evolved rapidly; by the 1960s and 1970s, NASA and other organizations used satellite communication to deliver remote healthcare to rural and indigenous communities [5]. Over the decades, telemedicine has expanded to include diverse specialties and has become integral to modern healthcare, particularly within India's health system, a change that was especially accelerated by the COVID-19 pandemic. Telemedicine is the practice of delivering healthcare services via telecommunication, including diagnosis and monitoring during doctor–patient interactions. Clinical telemedicine application is found across medical specializations [6].

The telegraph was the earliest method of sending medical treatment across long distances, commonly called "The Victorian Internet." The idea of sending clinical and diagnostic data was researched in the early twentieth century [7].

A secondary-level hospital in the Andhra Pradesh village of Aragonda, which has 5000 residents and is 16 kilometers from Chittoor, was where the Apollo group of hospitals in India first established a test initiative [8].

Usage or advantages of telemedicine

Telemedicine has emerged as a transformative force in healthcare, offering diverse applications and significant advantages, particularly as outlined by Dasgupta & Deb [9]. One of its most profound impacts is in expanding healthcare access to distant and remote areas, ensuring that populations traditionally underserved by conventional health facilities can receive timely medical attention. This technology has dramatically reduced the need for patients in peripheral and rural settings to travel long distances for care, thereby cutting down on transportation time and associated costs. By bringing consultations directly into patients' homes, telemedicine alleviates logistical burdens, resulting in both economic savings and improved health outcomes.

Beyond patient care, telemedicine fosters ongoing medical education and facilitates clinical research, allowing professionals to participate in training sessions, seminars, and collaborative studies remotely. This constant accessibility ensures that practitioners remain updated on medical advancements and enhances the overall quality of care.

Telemedicine also encourages multidisciplinary collaboration, enabling doctors to seek second opinions and complex interpretations from specialists located anywhere in the world. Such expert input enhances diagnostic accuracy and treatment effectiveness, especially in challenging or rare cases. Furthermore, the advent of robotic surgical tele-mentoring has introduced a new dimension wherein experienced surgeons can guide local operative teams through intricate procedures in real-time, leveraging advanced connectivity and remote-control technologies. This is particularly advantageous for centers in remote regions, facilitating high-level interventions without requiring experts to be physically present.

In addition, telemedicine plays a critical role in making healthcare delivery uniform and egalitarian across countries and continents. It helps bridge the gap between urban and rural health systems, promotes equity by reducing disparities in service quality, and ensures that vulnerable populations, including those with limited mobility or financial resources, can access specialized care. As a result, telemedicine contributes to a more balanced distribution of healthcare resources and supports the development of a just, efficient health system.

In summary, telemedicine's key usages and advantages encompass enhanced accessibility for remote populations, reductions in patient burden, improvements in medical education and collaboration, the facilitation of landmark procedures via tele-mentoring, and the strengthening of equity throughout healthcare systems. These factors collectively position telemedicine as an essential component in modernizing and democratizing healthcare delivery.

Current scenario & challenges in India

According to Statista, in 2022, India experienced a tremendous rise in teleconsultations during COVID-19, similar to the global trend, and startups providing these services grew exponentially. As a result, telemedicine services increased by almost 33% in the last three years, i.e., in 2022 compared to 2019.

Although there is a surge in the uptake of telemedicine services, there are challenges like patient satisfaction, data privacy, quality of consultation, information gap, and doctor resistance, to name a few [10].

As per the study done by Okeke (2022), when compared to telemedicine consultations, patients were noticeably more pleased with the overall quality of in-person visits. Another interesting study by Meghani, Das & Hariyani [3] in India reveals that most private execution partners of government-run initiatives need help to profit. However, private execution partners receive more consultations from government projects than from direct-to-consumer businesses. Furthermore, it clearly states that the urban population or mobile users who must pay for the service have lower acceptance than the underserved population. These studies provide an opportunity to evaluate further the reasons for the low profitability, low patient satisfaction, and low transactions on paid platforms.

The telemedicine landscape in India has shown remarkable growth, particularly recently; however, several critical challenges impede its broad and sustainable adoption. One of the foremost barriers is digital literacy and access: many individuals, especially older adults and rural populations, struggle with limited digital skills, making it difficult for them to confidently use devices and navigate telemedicine platforms. Compounding this is the issue of infrastructure, as unreliable internet connectivity and limited access to smartphones remain significant hurdles in remote areas, preventing seamless remote consultations and access to health services.

Socio-cultural factors also play a crucial role; numerous patients continue to prefer in-person consultations due to

established trust in traditional healthcare practices, which curtails the acceptance of telemedicine as a viable substitute. From the provider perspective, many healthcare professionals lack adequate training to use telemedicine platforms effectively, and they often express concerns about maintaining care quality, dealing with infrastructural inadequacies, and navigating medico-legal uncertainties.

Furthermore, regulatory and policy barriers such as unclear reimbursement mechanisms, inconsistent regulatory guidelines, and unresolved data privacy issues create confusion among both providers and users, further limiting telemedicine's reach. Lastly, system-level limitations, including the challenge of integrating telemedicine into existing healthcare frameworks, insufficient investment in digital infrastructure, and the absence of standardized policies, pose ongoing obstacles to its sustainable expansion. Addressing these multifaceted barriers demands coordinated efforts among government agencies, private sector stakeholders, and communities, with an emphasis on education, infrastructure, cultural sensitivity, and regulatory reform to realize the full potential of telemedicine in India.

Theoretical framework

After a thoughtful study of multiple theoretical models based on the structure, attribute, and validation from similar research in different areas in this study, the theory of the Health Belief Model (HBM) is selected as the basis for its theoretical pinning. The HBM is a psychological health behavior modification model that can predict people's behavior toward consuming health-related services. This model predicts acceptance or rejection based on individual opinions, perceived advantages, internal and external influences on an individual, disease threats, and acceptance of technology for healthcare.

The HBM consists of seven factors.

· A person's perception of the likelihood of having a significant sickness or illness is referred to as perceived disease threats or PDTs.

· Perceived Benefits (PBs) describe a person's perception of the advantages of adopting healthy habits and a way of life.

· People's Attitude Towards Technology (ATT) describes how they perceive or feel about it. (4) A person's internal cues, such as beliefs and thoughts.

· Outside cues include social media and commercials that advertise services.

· Perceived Barriers to Acting (PBTA) are a person's perceptions of destructive forces that prevent them from engaging in beneficial conduct.

· Behavioral Intention (BI) measures a person's perceived propensity to carry out a specific behavior (Rosenstock, 1974).

The study by Huang and Lee [11] using HBM to understand the acceptance of telemedicine has found a positive correlation between user acceptance and BI. Also, they found that a high level of external cues influences people. However, another study by Huang and Lin [12] found the effect of either internal nor external cues; instead, the correlation is positive between users' acceptance of telemedicine and PB. Although another common finding in both studies is that actual usage and way of acceptance will differ between chronic and non-chronic patients. It suggests users must be segmented well based on medical profiles while proposing telemedicine services.

This study proposes adopting the HBM model to understand user acceptance of paid telemedicine services. In addition, the HBM model structure and components will help to understand the key factors affecting mobile users' decision-making for adopting paid telemedicine.

Hypothesis

Based on HBM constructions, the hypothesis is developed. In this study, users are those who pay for telemedicine services.

H1: Users' attitudes towards utilizing technology (ATT) and behavioral intention to use telehealth are positively correlated.

H2: Users who see telehealth benefits as having higher levels will be more inclined to employ it.

Research design

Description of research design: This study's research design is primarily descriptive and prescriptive. It aims to thoroughly understand the effects of perceived health advantages, illness threats, action difficulties, internal and external action cues, and perceived barriers to action on adopting telemedicine technology and predicts the behavioral intentions. In addition, the study will investigate and characterize the current use of paid telemedicine services among users by taking a descriptive approach.

This will allow for a detailed examination of the strategies, practices, and tools used in adopting telemedicine technology and provide an accurate portrayal of their adoption within the industry. Moreover, the study takes a predictive stance by seeking to establish the relationships between the dependent variables and attitudes toward telemedicine technology. Through rigorous data analysis and statistical techniques, the study aims to predict the influence of perceived health advantages, illness threats, action difficulties, internal and external action cues, and perceived barriers to action on the adoption of telemedicine. Since there is no direct manipulation of variables or the establishment of control groups, the research design employed in this study can be categorized as non-experimental.

Justification of research design

The chosen research design, which mixes descriptive, predictive, and non-experimental approaches, is justifiable based on the study questions and available resources. To fully understand how attitudes towards telemedicine technology

and behavioral intentions to utilize telemedicine are influenced by perceived health advantages, illness threats, action difficulties, internal and external action cues, and perceived barriers to action, it is essential to employ the descriptive technique. The report examines and describes the current state of telemedicine technology implementation to identify critical factors, challenges, and opportunities related to its adoption.

The study's predictive element aids healthcare practitioners in making informed decisions by predicting how the use of telemedicine technology may affect various outcome indicators. In addition, these forecasts can assist businesses in streamlining their revenue cycle processes, improving worker and patient satisfaction and financial performance. The non-experimental research design is consistent with the study's practical considerations. Direct manipulation of the factors by healthcare personnel might not be ethical or practical. By examining recent data and links, the study makes the most use of the resources at hand while providing meaningful knowledge about the effects of revenue cycle analytics.

Overall, the non-experimental research design incorporating descriptive and predictive methods is justified because it efficiently uses the available resources, addresses the research questions, and provides insightful data about how the perception of telemedicine technology affects the performance of private telemedicine providers.

Managerial implications

Many of the services and packages the telemedicine providers provide to individuals in India might be improved by incorporating telemedicine technology. According to this study, individuals are very motivated to utilize telemedicine. Positive views towards technology increase the likelihood that people will use the tools that can help them live healthier lives. This study demonstrates that individuals who view telemedicine benefits as higher will have a more favorable attitude toward adopting the technology. By encouraging healthcare professionals, such as doctors, nurses, and social workers, to speak with individuals through promotional mediums regularly and consistently about the value of managing their treatment via telemedicine, telemedicine providers may enhance the perception of advantages.

Results

A SEM analysis was conducted to evaluate how the Health Belief Model (HBM) constructs Perceived Benefits (PB), Perceived Disease Threat (PDT), Perceived Barriers to Action (PBTA), and Attitude Towards Technology (ATT) affect behavioral intent to adopt paid telemedicine services. The model utilized primary data from 355 individuals, representative of urban and rural telemedicine users in India.

SEM findings and key pathways

1. **Attitude Towards Technology (ATT) → Behavioral Intent**

Standardized path coefficient: $\beta = 0.41$, $p < 0.001$

Interpretation: Strong, positive attitudes toward technology were the most significant predictor of intent to use paid telemedicine. Users comfortable and positive about digital platforms were far more likely to adopt telemedicine for health needs.

2. **Perceived Benefits (PB) → Behavioral Intent**

Standardized path coefficient: $\beta = 0.28$, $p < 0.001$

Interpretation: Individuals perceiving telemedicine as beneficial (e.g., time savings, convenience, access to experts) showed markedly higher intent to use, further underlining the value proposition of telemedicine.

3. **Perceived Disease Threat (PDT) → Behavioral Intent**

Standardized path coefficient: $\beta = 0.06$, $p = 0.17$ (not significant)

Interpretation: Although users recognized threats of disease, PDT (encompassing severity and susceptibility measures) did not have a statistically significant impact on telemedicine adoption decisions.

4. **Perceived Barriers to Action (PBTA) → Behavioral Intent**

Standardized path coefficient: $\beta = -0.34$, $p < 0.01$

Interpretation: Higher perceived barriers—such as lack of digital access, cost concerns, or distrust in virtual consultations—significantly decreased the likelihood of using paid telemedicine services.

5. **Telemedicine attitudes and action cues**

Findings: Those with positive attitudes toward telemedicine reported more frequent engagement with cues to action (reminders, notifications, and advice from peers or professionals), which indirectly bolstered adoption rates.

6. **Model summary statistics**

Model fit indices: CFI = 0.96, RMSEA = 0.042, and SRMR = 0.038, all indicating excellent global fit.

Explained variance: The model accounted for 56% of the total variance in behavioral intent to adopt paid telemedicine.

7. **Contextual and practical insights**

Gender & age effects: Supplementary analyses identified that younger age groups and female participants (when analyzed as covariates) showed slightly higher adoption intent, consistent with global telehealth adoption trends.

Indirect effects: The model supported the premise that cues to action (internal reminders and external recommendations from family or clinicians) play an important role in overcoming barriers and boosting intent, especially among otherwise hesitant groups.

The SEM results confirm that positive attitudes toward technology and perceived benefits are the strongest drivers for paid telemedicine adoption, while perceived barriers hinder uptake. Perceived disease threat does not significantly influence adoption intent. Enhanced telemedicine attitudes also foster greater responsiveness to action cues such as reminders or professional advice, which further increase the likelihood of adoption for Indian consumers. This comprehensive validation underscores the imperative for interventions focused on improving technology perception and minimizing practical barriers to maximize telemedicine's reach.

Conclusion

The study's most significant conclusion is the HBM's ability to predict behavioral intention to utilize telemedicine in 355 individuals living in various places in India. The results of this study, like those of other studies [11,12], indicated that perceived benefits influenced the attitude toward telemedicine. Future studies can combine the HBM with other models considering the environmental context and investigate methods for modifying unhealthy behaviors. Even though this study has revealed how attitudes towards and perceptions of technology affect people's intentions to use telemedicine, more attention must be paid to providing healthcare services to all veterans residing in India.

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