# Transcending telemedicine: exploring telemedicine adoption perspectives of physicians

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## Article Info

## ABSTRACT

Telemedicine has become indispensable in contemporary healthcare, reshaping patient care worldwide. The utilization of it has significantly risen in the Philippines, particularly during the pandemic, mirroring a global trend. Nevertheless, there is a dearth of studies regarding its pragmatic implementation among Filipino physicians, a crucial aspect for enhancing healthcare delivery. A qualitative analysis utilized in-depth interviews with experienced physicians in the Philippines. The researchers employed an inductive methodology to investigate how 13 physicians integrate telemedicine into their private medical practices. The selection of participants was purposeful, specifically targeting physicians with more than two years of experience in telemedicine. The qualitative data collected was subjected to a rigorous thematic analysis, comprehensively examining the current telemedicine integration situations. The examination of the data indicated a central theme: 'Transcending Telemedicine', emphasizing its influence that goes beyond being a mere technological tool. It overcomes time, space, and geography constraints, enhancing physicians' ability to serve patients. There are four subcategories connected that contribute to or hinder the achievement of this goal: factors influencing adoption and factors influencing implementation and responses and reactions to telemedicine adoption. This paper contributes to the general understanding of telemedicine's function in healthcare, specifically in the setting of a developing country. It emphasizes the necessity for continuous support and adjustment to maximize its benefits.

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## 1. INTRODUCTION

Technological advancements continuously transform diverse industries, yielding favorable worldwide effects [1], [2]. The COVID-19 pandemic has shown substantial deficiencies in the healthcare system in developing countries. This is characterized by significant insufficiency, unbalanced allocation, and absence of crucial healthcare resources and infrastructure [3], [4]. Telemedicine is conceptualized as an integrated healthcare delivery system utilizing telecommunications and computer technology, offering a substitute for traditional face-to-face interactions between physicians and patients [5]. Given the constraints, developing nations redirected their focus towards the progress and implementation of telemedicine, a transition that showcased effectiveness during the pandemic [6]. As reported, there has been a notable substantial increase of 44% in telemedicine services in the last five years [7]. This growth is evident in

telemedicine's wide range of applications, including "radiology, psychiatry, pathology, emergency medicine, and various internal medicine specialties such as cardiology and neurology".

Telemedicine's rapid growth, spurred by the pandemic, extends beyond its initial goal of serving rural areas, unveiling numerous benefits [8]. Despite its expected global market value reaching USD 103,897 million by 2024, full integration faces challenges, especially in developing countries [4]. Overcoming these barriers requires innovative, technology-driven medical solutions. For instance, in Malaysia, telemedicine enhances healthcare access, reduces costs, and helps mitigate hospital overcrowding, illustrating its potential in transforming primary healthcare delivery [9]–[11].

Although a substantial volume of research on telemedicine has been generated, with a remarkable 15,633 articles emerging from 2020 to the present, a significant gap persists, especially in Asian countries. The prevailing research predominantly concentrates on the patient-centric aspects and overarching impacts of telemedicine while neglecting the unique experiences and challenges encountered by physicians [12]–[14]. Specifically in the Philippine context, the nascent and underdeveloped state of telemedicine, a modality only recently unveiled to the broader population amidst quarantine mandates [6]. Even in the face of technological advancements and the clear benefits telemedicine offers, its widespread adoption continues to be constrained [15]–[18].

The primary research question guiding this study is: What determinants impact the acceptance and execution of telemedicine by physicians, and how do they respond and react to its integration into their practice? This study aims to contribute to the existing body of literature by investigating key questions related to the adoption of telemedicine, therefore providing a more comprehensive understanding of this topic. The insights gained from this study are expected to have broader implications, resonating with and offering guidance for similar situations worldwide, particularly in low- and middle-income countries.

## 2. METHOD

This research is anchored in a qualitative and inductive design, a chosen approach to delve deeply into the multifaceted experiences of physicians in the Philippines integrating telemedicine into their private practices. This design allows for an exploration that goes beyond mere facts, offering insights into patterns, themes, and contexts that underline the physicians' narratives and experiences in the adoption of telemedicine. The study has 13 physicians as shown in Table 1 representing a diverse range of disciplines: endocrinology, psychiatry, hematological, infectious diseases, dermatology, ENT, family medicine, pediatrics, and primary care. The individuals originate from different urban areas around the Philippines. The purposive sampling, which includes physicians with over two years of telemedicine experience, reinforces the reliability of the insights gathered, as the respondents bring a wealth of practical knowledge and diverse experiences to the research.

Table 1. Participants profile

| Code | Specialty | Location |
|------|-----------|----------|
| P1 | Endocrinology | Iligan City |
| P2 | Psychiatry, Psychology | Surigao del Norte |
| P3 | Hematology | Iligan City |
| P4 | Infectious disease | Davao City |
| P5 | Psychiatry | Manila |
| P6 | Dermatology | Cebu City |
| P7 | Ent | Manila |
| P8 | Psychiatry | Mandaluyong |
| P9 | Family medicine | Meycauayan City, Bulacan |
| P10 | Family medicine | Iloilo City |
| P11 | Pediatrics | Quezon City, Manila |
| P12 | Primary care | Manila |
| P13 | Primary care | Manila |

Based on Seidman theoretical framework, a series of comprehensive interviews were carried out to explore different aspects of physicians' experiences in adopting telemedicine [19]. A series of in-depth interviews, ranging from 30 to 55 minutes, were conducted. These interviews revealed the motivations behind adopting telemedicine, the obstacles faced, the practical aspects of implementing telemedicine, and a detailed overview of telemedical practices.

The data analysis phase is distinguished by a systematic and in-depth theme examination [20]. The initial stage of this study involves a thorough examination of the transcribed interview data, followed by a

systematic coding procedure, as depicted in Table 2. Initially, a careful review of the transcribed interview data is conducted. This is followed by a systematic coding procedure, detailed in Table 2. Codes are derived inductively from the data, with text segments labeled with phrases that succinctly capture their essence. These initial codes are grouped into potential themes and then reviewed and refined iteratively. Subsequently, these themes are organized into broader categories that encapsulate the core aspects of the participants' narratives. The final step involves articulating and naming these overarching concepts, resulting in a consolidated and coherent presentation of the findings. This analytical process is pivotal in providing a nuanced understanding of the participants' experiences, challenges, and perspectives within the evolving landscape of telemedicine.

Table 2. Sample of initial coding of data

| Sample incident in the data | Code (s) | Concept (s) | Category (sub-activity) |
|---|---|---|---|
| "So far it is an effective tool because it can make patient open-up like they have a certain safe place that they are confident that what they open up cannot be shared and it is okay since they are far and that physicians are not part of their circle. They can do this at the comfort of their home". (2.13) | Benefits (Enables confidential communication) Benefits (Encourages patient disclosure) | Confidentiality | Anonymity |
| "But some patients really have a struggle on internet access so the consultation becomes ineffective. Audio problems, video problems prolong consultation and sometimes both the patients and I become frustrated". (1.25) | Telemedicine might not be appropriate for all (e.g., bad Internet signal causing audio, video problems) | Internet Limitations | Technical difficulties |
| "Instead of going to the city, cost-efficient since less transportation". (5.5) | Cost-saving Benefit (transport saving) | Cost-saving | Cost-effectiveness |

Data saturation was achieved when no new codes or themes emerged from subsequent interviews, ensuring the thoroughness of the data collection process [21]. This concept is pivotal in qualitative research as it implies that the dataset is sufficiently comprehensive to support the study's findings. Rigor was maintained through various validation strategies, including member checking, where participants were invited to review the analysis for accuracy and resonance with their experiences [20], [22]. Additionally, transcription was conducted using Good Tape transcription software, and an independent researcher verified the accuracy to enhance reliability and reduce researcher bias. Furthermore, a detailed audit trail was maintained, documenting all decisions made during the research process to provide transparency and allow for replication [23].

This study strictly adhered to the ethical principles outlined in the Declaration of Helsinki. All participants were informed of the study's objectives, methods, potential impacts, and their rights as study subjects. Written informed consent was obtained from each participant, ensuring their voluntary participation and the right to withdraw from the study at any time without any consequence. Confidentiality was maintained throughout the research process. Participants' identities were anonymized using pseudonyms, and all personal information was securely stored and accessible only to the researcher. The ethical guidelines of De La Salle University-Manila were followed to ensure integrity, confidentiality, and informed consent. Participants were also provided with contact information for the research team should they have any questions or require access to the data collected about them.

## 3. RESULTS AND DISCUSSION

The findings of our study are represented visually in Figure 1 through a thematic diagram. The central theme, "transcending telemedicine", highlights how telemedicine is more than just a tool or technology. Instead, it enables physicians to overcome time, space, and geography limitations to offer better healthcare services to their patients. Four subcategories connected contribute to or hinder the achievement of this goal: factors influencing adoption, factors influencing implementation, and responses and reactions to telemedicine adoption. The concept of transcending telemedicine entails more than simply implementing the technology. It requires a shift in practices and attitudes to fully harness telemedicine's potential in healthcare delivery.

### 3.1. Factors influencing adoption and implementation

The findings of this study reveal several insights into the adoption of telemedicine among physicians in the Philippines. The findings of this study offer valuable insights into the adoption of telemedicine among physicians in the Philippines. 'Compelled adoption' of telemedicine may arise in specific circumstances, such

as regulatory adjustments or emergencies, necessitating urgent action and uninterrupted care. The adoption process can be accelerated, particularly in situations requiring immediate action, such as during a pandemic. This observation aligns with the findings of a systematic review conducted by Valencia-Arias *et al.* [24], where numerous countries adopted telemedicine to deliver patient care while reducing the danger of transmitting COVID-19.

> *"I started during the pandemic, as there was no choice then. I think you know the situation; we opted to do Telemedicine primarily to reduce exposure of the patients and us doctors as well."* (P6.2)
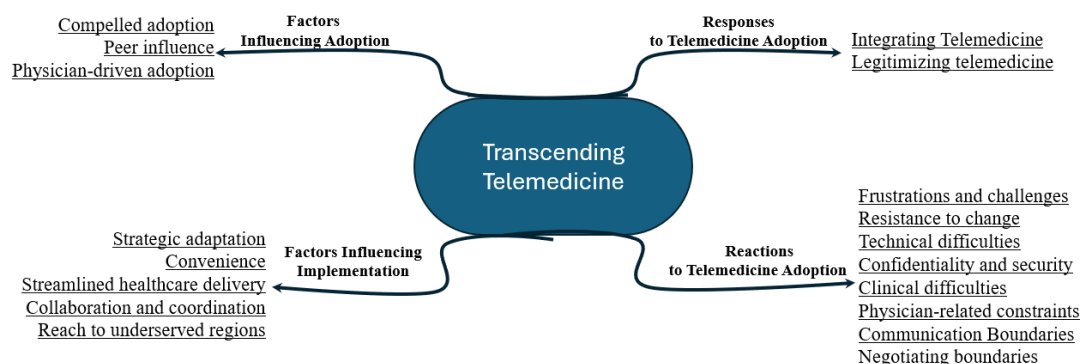


Figure 1. Thematic diagram

The onset of the pandemic triggered a surge in telemedicine adoption as a response to the health crisis. Many physicians, unprepared for its integration into conventional medical practice, experienced a transformation in their beliefs regarding telemedicine. This phenomenon, called 'belief transformation', prompted physicians to forcibly integrate telemedicine into their practice upon recognizing it is benefits. Studies such as the one conducted by Xu *et al.* [25], have identified this motivation, known as 'pandemic-triggered adoption', which drove certain physicians to embrace telemedicine as an initial step in their practice. This adoption trend has been instrumental in addressing the lack of physicians and facilities in remote areas, enabling physicians to extend medical services efficiently.

'Peer or social influence' is a significant factor in telemedicine adoption among physicians. The experiences and recommendations of colleagues regarding telemedicine can profoundly impact physicians' decision-making processes, fostering a sense of trust and credibility that leads to increased adoption rates. Colleagues often provide valuable support by offering advice, guidance, or feedback on the technology, encouraging physicians to adopt it [26]. Pasco [27] quantitative study provides statistical evidence supporting the role of social influence as the primary determinant of the intention to adopt telemedicine among physicians. Additionally, subjective norms among patients have been shown to promote telemedicine adoption [26], [28], further demonstrating the significance of social impact in the process of adoption.

> *"But when I finished my fellowship training last year and started my private practice, I actually did not consider coming up with a Telemedicine clinic. I was just encouraged by my batchmates to do Telemedicine because, for one, it's convenient for the patient and yourself also because you will be in your home and the patient also will be in the comfort of their homes when they seek consult with you."* (P4.3)

'Physician-driven adoption' is crucial for the success of telemedicine. As primary caregivers, physicians are vital to increasing its adoption in their respective practices. Physicians can significantly enhance patients' access to quality healthcare by advocating for the numerous benefits of telemedicine solutions. This aligns well with the results of Kuo *et al.* [29] the stronger a physician's positive view toward telemedicine technology, the higher the probability that the physician will incorporate it into their practice.

Through 'strategic adaptation', physicians leverage telemedicine to offer remote consultations, expanding their reach and generating revenue without needing physical clinic investments. By embracing telemedicine, physicians capitalize on potential cost savings associated with traditional clinic setups, tap into

new revenue streams, and increase accessibility to patients. Also, this approach enables them to overcome geographic barriers and cater to patients in remote or underserved areas efficiently [18], [30].

> *"I don't have a physical clinic. I private practice through Telemedicine. It is also cost-effective; if you have a physical clinic it would cost you rent, or the secretary, the BIR registration."* (P5.2)

The view of physicians regarding the ease of use and usefulness of telemedicine also greatly influences their decisions to utilize it. Physicians are more inclined to adopt and incorporate telemedicine into their practice routines if they perceive telemedicine tools as intuitive, user-friendly, and advantageous in enhancing patient care [30], [31]. The 'convenience' telemedicine offers are paramount, allowing physicians to conduct consultations from any location with internet access. This streamlines time management, benefiting both physicians and patients. Patients also benefit from the convenience of receiving medical care from the comfort of their own residences, avoiding the time and expenses associated with conventional in-person consultations [32], [33].

> *"Sometimes it is quite difficult for them to do frequent face-to-face follow-up. I have the option of doing Telemedicine with virtual consultation if ever I need more frequent follow-ups."* (P3.9)

It is worth mentioning that telemedicine apps and their features make telemedicine services more convenient and effective and offer the potential for more 'streamlined healthcare delivery' processes. Notable features in this system comprise video conferencing, secure messaging, electronic prescribing, appointment scheduling, remote monitoring, and integration with electronic medical records (EMR) [30], [34]. These capabilities augment physicians' capacity to deliver high-quality patient treatment and streamline tasks such as arranging appointments, managing patient information, billing, and invoicing.

> *"I find it really efficient and convenient tool. I love the features, you can do teleconsultation, contact patients, record patients, cueing there is also payment and* billing.*"* (P4.14)

> *"There's better continuity of care because in the application you can setup a time to follow up patients, so they will be reminded by the* secretary *to proceed on the schedule based on their preference usually i do teleconsult at night."* (P2.15)

The use of telemedicine enhances patient care by 'promoting collaboration and coordination' among physicians. It also enables healthcare services beyond traditional geographic boundaries, allowing physicians to refer patients to other specialists for consultations [30], [35]. In addition, telemedicine breaks down geographic barriers and provides healthcare services to remote areas or provinces with limited specialized healthcare services, improving access and equity in healthcare delivery.

> *"I have actually consultancy within hospitals far from Iligan, like I have a consultancy in Gingoog city also asking Endocrinologist. Since I can't go to the area frequently to the patient, most of them being referred through Telemedicine."* (P1.18)

> *"In fact, I have patients from France-Filipinos working there. They like Filipino doctors. This is for counseling. I have patients also in Switzerland, Abu Dhabi, and also Japan."* (P2.29)

The review by Stoltzfus *et al.* [35] and Haleem *et al.* [30] supports our study findings regarding the benefits and adoption of telemedicine in healthcare practices: the increased adoption of telemedicine during the pandemic, how it bridges the gap between urban and rural medicine to enhance access to care for underserved populations, the convenience and accessibility that telemedicine offers to both patients and healthcare providers and the positive impact of telemedicine on health outcomes and patient care.

### 3.2. Responses and reactions to telemedicine adoption

Incorporating telemedicine into healthcare environments produces diverse emotions and reactions from physicians. This section delves into how physicians are reacting to the implementation of telemedicine. Understanding these reactions is crucial to recognizing the obstacles, worries, and tactics that physicians utilize while integrating telemedicine into their regular practice. One typical response that physicians may encounter is 'frustrations and challenges' during the adoption and implementation of telemedicine. The incorporation of new technologies and workflows can be accompanied by technical issues and adjustments in practice routines, leading to frustration or uncertainty: 'technical difficulties' encompass problems pertaining to the functionality or accessibility of the technology necessary for telemedicine to operate effectively. These

are common barriers in low-middle-income countries [30], [36]. Technical glitches, such as audio and video issues, can lead to lengthy and inefficient telemedicine consultations, causing frustration for both doctors and patients. Inadequate internet connectivity, especially in rural regions, hampers communication quality during Telemedicine consultations. 'Clinical difficulties' pertain to the challenges or disadvantages in precisely diagnosing and treating patients via telemedicine due to the absence of physical interaction and examination. These limitations include the potential for excluding or misinterpreting significant particulars during a video consultation that cannot be verified or clarified and the incapacity to physically evaluate patients with specific symptoms or complaints. This is aligned with the study of Gajarawala and Pelkowski [10].

*"But some patients really have a struggle on internet access so the consultation becomes ineffective. Audio problems, video problems prolong consultation and sometimes both the patients and I become frustrated."* (P1.25)

'Confidentiality and security concerns' pertain to the possible dangers and vulnerabilities that could jeopardize the privacy, accuracy, and accessibility of patient and physician data in telemedicine. These difficulties encompass instances such as inaccurate physician information or the improper use of personal data and information, including license numbers, for illicit operations like altered prescriptions and counterfeit medical certificates. Our findings and the study Gajarawala and Pelkowski [10] underscore the importance of adhering to legal and regulatory requirements to ensure telemedicine is a safe and ethical practice. There is a critical need for healthcare providers to maintain the integrity and security of patient data while complying with laws and regulations governing telehealth practices, especially regarding the prescribing of controlled substances.

"*A primary concern is that patients, particularly those seeking medical certificates, may provide false information.*" (10.6)

"*Since prescriptions are already in digital form, there is a risk that your personal data and information, especially license numbers might be* used *for illegal use. For example, tampered prescriptions and fake medical certificates that are now rampant online.*" (P11.9)

'Physician-related constraints' are associated with the telemedicine service's healthcare physician. This can also encompass problems such as fatigue resulting from the augmented burden of telemedicine appointments. This is caused by the additional workload experienced by physicians during after-hours work [37]. 'Communication boundaries' pertain to the possible encroachment on personal space and time that might occur when telecommunication platforms are used for telemedicine. This can happen when personal contact information is shared, potentially violating privacy and personal space. Physicians may have concerns about patients, inundating them with everyday inquiries, which could breach professional boundaries. This is where physicians learn to 'negotiate boundaries' regarding the use and integration of telemedicine into their practice. They also establish guidelines and protocols to ensure the appropriate and effective utilization of telemedicine tools, considering patient privacy, data security, and ethical considerations.

*"Because my telemedicine schedule is at night and I am already tired by that time."* (8.14)

*"With telemedicine, sometimes of course during the initial phase, you have to give your personal details, including your personal numbers. So, they may bombard you with questions already even if it's not yet scheduled follow-ups where they can ask the questions they want. I noticed that the main problem is that they bombard you with questions every day, which makes you lose the boundaries."* (P8.5)

'Resistance to change' is another reaction that may arise among physicians. This resistance stems from various factors, including concerns about disrupting established workflows, fear of the unknown, and skepticism about the efficacy of telehealth compared to traditional in-person care. It is crucial to address these concerns and present evidence-based information regarding its advantages to mitigate opposition and assist the acceptance of telemedicine. Physicians may feel comfortable with their current practices and reluctant to adopt new technologies or methods, especially if they perceive them as incompatible or disruptive to their workflow. The concept of compatibility discussed by Tsai *et al.* [38] aligns with the phenomenon of resistance to change. Physicians who perceive telehealth as compatible with their existing practice processes are less likely to resist its implementation and more likely to accept and embrace it.

Conversely, those who perceive telehealth as incompatible may exhibit greater resistance to its adoption. However, some physicians have adapted and innovated to effectively incorporate telemedicine into patient care. They modify their practices, embrace new technologies, and develop innovative approaches to enhance the integration of telemedicine into their routine workflows. This adaptive mindset allows physicians to leverage telemedicine's capabilities and overcome potential obstacles. Certain physicians devise strategies to overcome or reduce the restrictions while maximizing the advantages.

> *"Prior to the pandemic, I didn't really do this. I'm not a proponent of teleconsult or even video consultation, I did not like the idea of not being able to see the patient. And not being able to examine them really feel that I would not be able to come up with a proper diagnosis, correct diagnosis without seeing the patient."* (P7.2)

> *"I fully recognize the limitations of telemed and work around it, only treating patients that are eligible for management through telemedicine."* (P13.1)

In relation to the implementation of telemedicine among Filipino physicians, it is also possible to draw a parallel with the "Health information technology and technology acceptance model (HITAM)" [39]–[42]. TAM posits that "perceived usefulness and perceived ease of use" are key determinants of an individual's intention to use technology [43]. In our study, physicians' perceptions of the usefulness of telemedicine, influenced by factors such as convenience, efficiency, and improved patient care, are highlighted as crucial in driving adoption. Similarly, the ease of use of telemedicine platforms, as mentioned by physicians appreciating intuitive and user-friendly features, aligns with TAM's emphasis on perceived ease of use. Physicians' frustrations, concerns about confidentiality and security, and resistance to change are reflective of TAM's concept of perceived barriers to adoption [44]. Conversely, physicians who adapt and innovate to effectively incorporate telemedicine into their practices demonstrate TAM's notion of perceived benefits outweighing perceived barriers [45]. Social influence can also be seen as an external variable influencing technology acceptance within the TAM framework [46]. Social influence can shape perceptions of technology and contribute to positive attitudes toward adoption. Lastly, the concept of physician-driven adoption, where physicians play a central role in increasing telemedicine adoption by advocating for its benefits, is consistent with TAM's focus on individual beliefs and attitudes shaping technology acceptance [47].

This study has several limitations that should be considered when interpreting the results. First, the findings are generalizable regarding the sample size and the respondents. Second, the qualitative nature of this research provides deep insights into the participants' experiences but does not allow for the quantification of data, which could offer different perspectives on telemedicine adoption rates and effectiveness. Lastly, as this study relied on self-reported data, there may be inherent biases or inaccuracies in how participants recall and report their experiences and attitudes toward telemedicine.

Future research could expand on the findings of this study in several ways. Quantitative studies involving larger, more diverse samples could provide a broader understanding of telemedicine adoption across different medical specialties and regions. Longitudinal studies could explore changes in attitudes and adoption over time, mainly as telemedicine technology evolves and integrates more fully into healthcare systems. Additionally, comparative studies between different countries or within different healthcare settings could offer insights into the variables that influence telemedicine adoption globally.

## 4. CONCLUSION

The findings elucidate multiple aspects that influence the utilization of telemedicine, unveiling both the benefits and obstacles physicians face. The primary focus, 'transcending telemedicine', highlights the profound influence of telemedicine in surpassing temporal, spatial, and geographical constraints, hence augmenting healthcare provision. The study's findings are essential for stakeholders such as the government and healthcare institutions to effectively plan the smooth incorporation of telemedicine in the Philippines. This publication enhances the general understanding of telemedicine's function in healthcare, specifically in the setting of a developing country. It emphasizes the necessity for continuous support and adjustment to maximize its benefits.

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