

EXPLORING TELEMEDICINE PERCEPTIONS AMONG COMMUNITY RESIDENTS

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ABSTRACT

Telemedicine is the remote delivery of healthcare services using digital communication technologies, such as video calls and messaging platforms. It enables patients to consult with healthcare providers without traveling to a clinic or hospital, improving access to medical care, especially in rural areas. This study explored residents' perceptions of telemedicine in Barangay Paitan, Bayombong, Nueva Vizcaya. Data were collected through semi-structured interviews with 11 participants aged 19 to 49, selected via snowball sampling, using a qualitative descriptive design. Findings revealed a general willingness among residents to use telemedicine, especially when they have access to the necessary technology and a stable internet. Participants identified benefits, including reduced travel time, lower healthcare-related costs, and better access to medical services. However, concerns included poor or unstable internet connections, insufficient devices, limited capacity for physical and laboratory assessments during virtual consultations, financial constraints, and low digital literacy. To overcome these barriers, participants suggested strategies such as borrowing gadgets, using barangay-provided Wi-Fi and generators, improving communication with healthcare providers during online consultations, and considering patients' financial situations when designing telemedicine services. In conclusion, telemedicine was viewed positively and seen as a promising approach to improving healthcare delivery in rural communities. Still, its success depends on addressing both technological and socioeconomic barriers.

Keywords: Digital literacy, healthcare access, rural healthcare, technology access, internet connectivity

INTRODUCTION

In the pulsating rhythm of progress, modernization emerges as the dance of societal transformation. However, at the beating heart of this evolution lies the electrifying crescendo of technological advancements – the symphony that propels us into an era where innovation is not just a choice but a dynamic force reshaping the landscape of our contemporary life. This technological symphony has a remarkable impact on the healthcare system, with its profound effects rippling through every facet of patient care. From the precision of robotic surgeries that minimize invasiveness and recovery times and the intricate web of electronic health records that streamline data management and enhance diagnostic capabilities to Telemedicine's reach that bridges distances and connects patients with specialists, technological advancements are revolutionizing healthcare into a harmonious blend of innovation and compassionate healing (Singh et al., 2022).

Haleem et al. (2021) define telemedicine as the delivery of medical services through digital communication technologies, enhancing patient outcomes, improving healthcare accessibility, and addressing geographical barriers. Similarly, the World Health Organization describes telemedicine as the provision of healthcare services in situations where distance is a critical factor. It utilizes information and communication technologies to facilitate the exchange of medical information for diagnosis, treatment, disease and injury prevention, evaluation, and continuous education of healthcare professionals (Ong et al., 2022). Telemedicine directly provides clinical care, for example, diagnosing, treating, or consulting via telecommunications

for a remote patient.

Noceda et al. (2023) found that Filipino patients generally expressed satisfaction with telemedicine, with cost, safety, and convenience playing key roles in shaping their perception and usage. Additionally, provider-related factors—such as trust in the physician's competence and the quality of the patient-doctor relationship—as well as technical factors, such as internet access, influenced satisfaction. Bitong et al. (2021) supported these findings by revealing that many patients preferred telemedicine, particularly voice and video calls through mobile phones, for non-urgent consultations. R2TMC has pioneered telemedicine, marking a groundbreaking milestone as the first electronic consultation service in Region 2, offering free online medical advice tailored to address various illnesses that patients may encounter at home. Similarly, the Bayombong rural health unit telemedicine process is organized through a clearly defined workflow to guarantee full and effective treatment.

One major concern among patients is the confidentiality of their health information during online consultations, underscoring the importance of privacy and data security (Hao et al., 2020). Technical challenges—such as poor internet connectivity and malfunctioning devices—can further impede service delivery and frustrate both patients and healthcare providers (Griffiths et al., 2020). Additionally, some patients feel that telemedicine lacks the personalized attention and thorough assessment offered by face-to-face consultations, which may affect their trust in the service (Nguyen et al., 2022). Another key challenge is the affordability and accessibility of reliable devices. In economically disadvantaged areas, many patients may own smartphones. Still, these often lack the features or internet connectivity required for telemedicine services (Omcare, n.d.). Social influences also significantly impact telemedicine adoption. According to Tavares et al. (2020), decisions to engage in telemedicine are often shaped by family, friends, and healthcare providers—especially when these individuals share positive experiences (Ghaleb et al., 2021).

In the Philippines, these challenges are particularly pronounced in underprivileged areas. According to Dela Cruz et al. (2021), infrastructural limitations and healthcare inequities remain major barriers to telemedicine adoption. Given that prior studies have predominantly relied on quantitative research designs, often overlooking nuanced community perceptions, Umayam's (2022) study revealed that, despite the widespread adoption of telemedicine, the majority of the public has only average to low knowledge of this healthcare delivery mode. The research found that favorable attitudes towards telemedicine do not always translate into greater knowledge. It is recommended that public views on the use of new technology in health consultations as an alternative to regular clinical consultations be explored. Hence, the study aimed to explore how residents in Barangay Paitan perceive telemedicine in terms of usefulness, ease of use, and attitude, while accounting for external factors. The research findings recommended community-centric telemedicine strategies for healthcare practitioners and local government units, addressing community concerns about the acceptance and adoption of telemedicine.

Research Objective

The study's main objective is to explore residents' perceptions of telemedicine in Barangay Paitan, Bayombong, Nueva Vizcaya. Specifically, the study aimed to:

1. Determine the community's willingness to accept and utilize telemedicine services.
2. Identify the benefits of telemedicine in healthcare accessibility within the community.
3. Identify specific concerns or hesitations about telemedicine.

4. Recommend community-centric telemedicine strategies to healthcare practitioners and local government units based on the gathered data.

METHODOLOGY

A qualitative-descriptive approach was used to provide an in-depth explanation of the community's utilization and acceptance of telemedicine, along with the benefits, challenges, and recommendations for its use. The study was conducted in Barangay Paitan, within the municipality of Bayombong, Nueva Vizcaya, Philippines. Barangay Paitan is a Geographically Isolated and Disadvantaged (GIDA) barangay, meaning it is a marginalized community physically and socio-economically distant from the main society.

The research participants were residents of Barangay Paitan who were not considered vulnerable. The study included 11 participants, categorized by age, gender, ethnicity, occupation, and socioeconomic status. In terms of age distribution, most respondents (54.5%) were middle-aged adults (30 to 49 years old), while 45.5% were young adults (19 to 29 years old). Regarding gender, most participants were female (72.8%), while males accounted for 27.3% of the total respondents. Regarding ethnicity, most respondents identified as Ilokano (90.91%), while a small proportion (9.09%) identified as Tagalog. Regarding occupation, a significant number of respondents (63.6%) were Barangay Health Workers, whereas 27.27% were barangay staff workers and 9.09% were SK chairpersons. In terms of socioeconomic status, most participants fell into the low-income category (₱10,957 to ₱21,914), accounting for 63.6% of the total. Meanwhile, 27.3% were classified as lower-middle-income (₱21,914 to ₱43,828). A small portion (9.09%) belonged to the poor category (below ₱10,957). Notably, no respondents belonged to the middle middle class, upper middle class, upper class, or rich categories. The study employed snowball sampling, a non-probability sampling method that is used primarily in qualitative research to reach a hidden population. Data collection was conducted through semi-structured interviews, guided by five (5) questions designed to address key issues related to perceptions of telemedicine. The questions were also translated into Tagalog and Ilocano to facilitate better understanding among the participants. During the interview and home-to-home visit on September 11, 2024, the researchers clearly explained the study to ensure that the participants understood the extent of their participation. After securing consent, interview sessions commenced, lasting less than 30 minutes each. The interview responses were gathered, transcribed, and analyzed thematically using Byrne's (2022) adaptation of Braun and Clarke's (2006) Six-Phase Qualitative Analysis Process.

RESULTS AND DISCUSSION

In this study, the researchers identified community residents' perceptions of telemedicine. The results are four (4) major theme classifications: (1) Acceptance and Utilization, (2) Perception of the benefits of telemedicine, (3) Challenges in telemedicine, and (4) Recommendations on community-centric telemedicine strategies.

Acceptance and Utilization of Telemedicine

Acceptance and utilization refer to an individual's openness and readiness to use remote healthcare services enabled by technology. It encompasses a person's comfort level, adaptability, and preparation to engage with digital health platforms, such as virtual consultations, remote monitoring, and telemedicine applications.

Ten (10) out of eleven (11) participants expressed willingness to accept and utilize

Telemedicine services. Most of them viewed it positively, especially for its convenience, faster service, and better access to healthcare in remote or underserved areas. The participants mentioned that Telemedicine is a good option if there is access to the necessary gadgets, internet, and Wi-Fi. Others pointed out that it can reduce the effort required for sick individuals to travel to clinics or hospitals. However, one (1) participant expressed reluctance toward telemedicine due to concerns about its clinical limitations. Specifically, the participant highlighted the constraints of telemedicine compared to in-person consultations, particularly in conducting laboratory tests and physical examinations. Nevertheless, a participant conveyed their excitement about telemedicine adoption, stating that:

"Yes, willing naman ako kasi kaysa naman 'yung pasyente hindi din lang pupunta para magpa-check up" (R10)

(Yes, I'm willing, because otherwise, the patient might not even come in for a check-up.)

Another participant shared a similar response: *"Okay lang basta kumpleto ng gadgets"* (R1)

(It's fine if we have complete gadgets)

The findings suggest that participants are willing to use telemedicine, particularly if they have access to reliable internet and appropriate devices. It is especially appealing in rural areas where hospitals are far away, with many appreciating its convenience and efficiency. This supports McKinley et al.'s (2021) findings, showing that telemedicine can improve access to healthcare in remote areas. Several participants also said they find telemedicine convenient, which agrees with Pavlov et al. (2022), who described it as an important part of modern healthcare. However, some participants still had doubts. They were concerned that doctors cannot perform physical check-ups or order lab tests through telemedicine, which remain important for a complete and accurate diagnosis. This is similar to the findings of Murphy et al. (2020), who reported that some people are unsure about telemedicine due to these limitations. These points show that people need better to understand both the benefits and limits of telemedicine. It's also important to improve internet service and provide the tools needed to support this kind of healthcare (Nguyen et al., 2022). A mix of online and in-person check-ups could be a good way to meet different needs (Zhang et al., 2023). Lastly, local leaders and healthcare workers should work together to help more people access and trust telemedicine in their area (López et al., 2023).

Perception of the benefits of Telemedicine

Perception of the benefits of telemedicine refers to the communities' understanding, attitudes, and evaluations of the advantages offered by telemedicine services. Nine (9) out of eleven (11) participants have highlighted how telemedicine reduces travel expenses and enhances healthcare accessibility, particularly in challenging environments, as evidenced by a participant's statement:

"Di na siya abala sa trabaho, tapos sa pamasaha, kasi mahirap yung daanan namin, dadaan ka pa sa ilog, magbabangka, so okay na yun." (R4)

(It won't be a hassle for work, and it saves on transportation costs, especially since our route is difficult; you have to cross a river and take a boat, so that's already a good option.)

Additionally, another participant stated that *"Makakatipid sa pamasaha shempre... Less time kasi hindi na pipila ng mahaba sa hospital"* (R1)

(It will help save transportation costs, and it takes less time because there is no need to wait for the long line in the hospital queue.)

The results show that most participants view telemedicine as cost-effective and time-saving, especially in remote areas with difficult access to hospitals. Telemedicine significantly impacts healthcare delivery, particularly in remote and resource-limited areas like Barangay Paitan. The residents noted that one of the benefits of telemedicine is reduced travel expenses, as their barangay is situated in a rural area far from health facilities. This finding is consistent with the study by Martín-Sánchez et al. (2021), which highlighted that a key benefit of telemedicine is the reduction in travel expenses, thereby eliminating the need for long-distance medical consultations. This is especially crucial for residents of isolated communities, where transportation costs and travel time can be prohibitive. In addition to cost savings, participants also emphasized that telemedicine is time-saving and more convenient, as they no longer need to wait in long queues or leave work to attend check-ups. This aligns with the findings of O'Reilly et al. (2022), who noted that telemedicine enhances accessibility by minimizing wait times and the inconvenience of physical visits, making routine consultations and follow-ups more efficient. Given these findings, it is recommended that local government units and healthcare providers implement more effective community-based telemedicine strategies to address these concerns and improve healthcare delivery in rural areas.

Challenges in Telemedicine

The challenges of telemedicine are the barriers or factors that discourage the successful adoption and use of telemedicine services. They include logistics, cultural, financial, and technological issues. Eight (8) participants highlighted internet connectivity issues, citing power outages, weak signals, and weather-related disruptions as major hurdles, particularly in rural areas. A participant shared:

"Ano lang naman siguro magiging problema diyen. Kung brown out. Hindi maka-access ng internet. Yun lang naman siguro ang problema. Wala naman akong nakikitang problema. Yun lang baka malobat." (R2)

(The only problem might be if there's a power outage, which would prevent internet access and cause low batteries. That's probably the main issue; I don't see any other concerns.)

Additionally, the 8 participants identified financial barriers as a significant concern, especially for low-income families struggling with costs for internet subscriptions, mobile data, and required devices. The lack of access to necessary equipment, such as smartphones, laptops, or tablets, further hinders telemedicine adoption. Concerns about limited patient-doctor interaction were raised, with three (3) participants emphasizing the difficulty of conducting proper physical assessments virtually and limited knowledge of how to operate gadgets, which was also noted as a possible obstacle, especially for older adults or those who are not tech-savvy. This is backed by the response of one of the participants, stating that:

"yun lang sa pisikal syempre.. halimbawa si doktor eh kailangan din na checkup talaga.. Halimbawa sa mga gamit. syempre kailangan din yon... tas yung iba hindi alam gumamit ng gadgets lalo na yung mga matatanda" (R8)

(The problem would be physical assessment. It would still be better if the doctor assessed the patient by using appropriate equipment. And also, some are not knowledgeable on how to operate gadgets, especially older adults)

The findings suggest that limited internet access and power stability, especially in remote regions, may make it difficult for telemedicine initiatives to reach rural populations. Moreover, some mentioned concerns about the lack of physical assessment and limited knowledge of how to operate gadgets. It implies that identifying and addressing such hindrances is essential to enhancing access to and the delivery of healthcare.

To solve these problems, both technical and social needs must be considered. Studies like Nguyen et al. (2022) emphasize the importance of a strong, reliable internet connection as the foundation for digital health. Community-based solutions such as public Wi-Fi hotspots, mobile data backup, or generators, as seen in Zhang et al. (2023), can help mitigate the effects of internet and power outages. Socioeconomic challenges, such as low income or unstable jobs, also affect whether people can use telemedicine, supporting López et al.'s (2023) finding that income affects digital healthcare access. The study emphasizes the need for a community-centric approach in the acceptance and utilization of telemedicine in rural healthcare systems.

Recommendations on Community-centric Telemedicine Strategies

Recommendations for community-centric telemedicine strategies are suggested actions or solutions based on the study's findings. They provide practical steps to address the telemedicine challenges.

Eight (8) participants stated that reliable, strong internet connections are necessary for telemedicine to be used successfully. Some of the suggestions were to use the barangay's Wi-Fi, to use backup connections like mobile data, or to find areas with stronger signals. They also mentioned finding a quiet area, asking doctors to speak slowly, and ensuring both parties understand each other for effective communication during telemedicine consultations. Furthermore, three (3) participants discussed using local resources, such as generators or free barangay Wi-Fi, to mitigate problems like power outages or poor connectivity. They proposed addressing the problem of limited gadget availability by borrowing devices from friends or family. It was also suggested that information on how to use these devices be shared. They also highlighted the role of work and income in accessing telemedicine. Financial stability, such as having a stable job, can facilitate access to telemedicine services. However, individuals with irregular earnings, such as farmers, may face challenges affording the resources needed for telemedicine. In addition, the relevance of telemedicine in handling urgent cases was recognized by a participant, stating that:

Ajay kwa maam ahh, nu kas pangarigan kasjayen ditoyen, agijay ngay pagipsaen dagita ne kwa signal, tano ahh, anytime kit nga adda agpaconsult kanyami ditoy haan nga putol-putol, ta no awan signal kih lalo no emergency na" (R11)

(Uhhh, if possible... and if telemedicine is implemented here, then strengthening the signals is a must.) So that when there are consultations, it would not be choppy, especially if there is an emergency.)

Another participant cited that *"Siguro pag brownout, naku.. Kapag dito lang naman pero kapag dito, meron namang generator pero hindi naman masyadong nagagamit kasi... Siguro kapag nai-implement na yan. Ipagamit na kasi kailangan yan eh." — "Kung wala ding gadgets. Ano na lang, kunwari may mga kamag-anak yung patient... Makigamit nalang." (R2)*

("In case of a power outage... we do have generators here, though they're not often used. Once it's implemented, maybe we could start using them since they'd be essential."--- "If there are no gadgets, maybe the patient could borrow one from a relative.")

Hence, all participants' responses imply that, to accept and utilize telemedicine in their barangay community-centric strategies, telemedicine must be integrated to achieve its benefits and experience its efficacy and efficiency. Among the mentioned strategies is the provision of a reliable internet connection to promote a successful consultation and to handle unforeseen incidents, such as power interruptions, using local resources in the barangay, such as generators.

Community-centric strategies are essential for successfully integrating telemedicine into communities, especially in rural or underserved areas. Participants emphasized the importance

of a reliable internet connection for effective telemedicine use. One of their main priorities was securing dependable internet access, which aligns with the findings of Zhang et al. (2023), who suggested using backup internet connections, connecting to the barangay's Wi-Fi, or finding areas with better network coverage to ensure consistent service. Additionally, participants recognized the value of utilizing local resources to address connectivity issues.

Another concern raised by participants was the lack of personal devices for telemedicine. Borrowing devices from family or friends was seen as a short-term solution. Participants also highlighted how local resources, like community Wi-Fi and generators, could help overcome these challenges. This is supported by Nguyen et al. (2022), who emphasized that these strategies ensure basic technical needs are met for those without high-speed internet access. The role of income and employment in accessing telemedicine was also noted. Farmers and others with unstable jobs may struggle to afford internet services. At the same time, those with stable incomes, such as government workers, have an easier time. This finding is similar to that of López et al. (2023), which showed that people with regular incomes were more likely to afford internet services, while those in irregularly paid jobs, such as farmers, faced difficulties. Finally, participants suggested that these adaptation plans must be implemented to facilitate the use of telemedicine. This is similar to the study by Zhang et al. (2023), which stated that developing systems to handle urgent medical cases via telemedicine and ensuring clear protocols for emergency consultations and medical attention are necessary.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study reveals that the community residents of Barangay Paitan are willing to accept and utilize telemedicine services if they have access to reliable internet and appropriate devices. The key benefits include convenience, cost savings, and improved access to healthcare services. It reduces travel costs, saves time by bypassing long hospital wait times, and provides easier access to care, especially for the elderly, those with limited finances, and people in remote areas.

However, several challenges include poor internet connectivity, power outages, financial constraints, a lack of necessary devices, limited physical assessments, and limited knowledge on how to use devices. To address these challenges, the community residents suggested strategies such as improving internet connectivity, using local resources like generators and barangay Wi-Fi, sharing or borrowing devices, enhancing communication during consultations, and considering patients' financial capacity to make telemedicine more accessible and widely accepted.

Recommendations

Based on the study's findings, the following recommendations are suggested to enhance community residents' access to and adoption of telemedicine services:

Barangay Local Government Units (BLGUs)

The Barangay Local Government unit of Paitan, Nueva Vizcaya, must take an active role in enhancing residents' access to Telemedicine services by upgrading internet infrastructure and extending initiatives like "Free wifi for all" to ensure that services are accessible to all. Additionally, the BLGU must initiate digital literacy programs to help individuals, especially older adults with limited technological knowledge, use telemedicine platforms effectively. Lastly, the BLGU must provide public information about telemedicine through local media outlets, such

as radio broadcasts, social media, and community postings, to inform community residents about telemedicine and its benefits, eliminate misconceptions, and encourage its use.

Community Residents

Residents should actively participate in digital literacy programs and community initiatives that educate them on using telemedicine for consultations. Families with access to smartphones or tablets can share their devices with those who do not have one, ensuring that healthcare remains accessible to all. Community members should also take advantage of available barangay Wi-Fi hotspots and identify areas with stable internet connectivity for telemedicine use. Moreover, encouraging open discussions about telemedicine within the community can help dispel fears and misconceptions, fostering greater acceptance of digital healthcare services.

Barangay Health Workers

Barangay health workers (BHWs) serve as the bridge between healthcare providers and the community. Training programs should be provided for Barangay Health Workers (BHWs) to help them facilitate virtual consultations and assist patients with technology use. Additionally, BHWs should help implement a hybrid healthcare model that combines telemedicine with in-person consultations, ensuring that patients receive comprehensive care. Regular home visits and barangay-based health education campaigns should also be conducted to build trust in telemedicine, particularly among older adults and those unfamiliar with digital platforms.

Healthcare Facilities

Healthcare facilities, particularly barangay health stations, the Bayombong Rural Health Unit (RHU), and the Region 2 Trauma and Medical Center (R2TMC), should enhance their digital infrastructure by equipping barangay health stations with the necessary telemedicine tools. Public awareness campaigns should educate residents on the benefits of telemedicine and guide them on accessing these services. To improve healthcare delivery, facilities must establish clear protocols for electronic prescriptions and collaborate with local pharmacies to ensure patients can easily obtain medications. Additionally, strengthening referral systems between barangay health stations and higher-level healthcare facilities will ensure that patients requiring in-person assessments receive timely medical attention.

Future Researchers

More research is required to determine the long-term effects of telemedicine on patient outcomes and satisfaction in remote locations. It is important to research the differences in digital literacy and access to technology, especially among the elderly and underprivileged. Research on cultural perspectives on telemedicine will help tailor outreach initiatives, and cooperation with healthcare providers will be extremely beneficial for implementation. Lastly, increasing the number and diversity of research participants can enhance the generalizability of findings, ensuring that strategies are inclusive and responsive to various demographic and socioeconomic groups.

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