THE LEVEL OF AWARENESS OF TELEHEALTH AVAILABILITY AMONG PREGNANT CLIENTS OF BAYOMBONG, NUEVA VIZCAYA

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ABSTRACT

Telehealth has emerged as a transformative approach in healthcare delivery and is gradually being adopted in the Philippines. Despite its growing relevance, there are few studies assessing awareness of existing telehealth services in Nueva Vizcaya. This study aimed to evaluate pregnant clients' awareness of telehealth availability in Bayombong, Nueva Vizcaya—a vulnerable population with a constant need for maternal care—and to determine the correlation between their awareness levels and demographic factors, including age, location, educational attainment, and income. A quantitative, descriptive-correlational research design was employed, involving 139 pregnant clients aged 10–49 in their first or second trimester, selected through stratified random sampling across 25 barangays. Data were collected face-to-face from September 2024 to January 2025 using a structured, reliable questionnaire (Cronbach's alpha $\geq$ 0.91), adapted from Z & S (2018) and the Department of Health (2022). Results showed moderate awareness in general knowledge (Mean = 2.78), provider (Mean = 2.64), and requirements (Mean = 2.85), but lower awareness in scheduling (Mean = 2.33) and contact platforms (Mean = 2.37). Significant correlations were found between awareness and both age ($\rho = 0.185$, $p = 0.029$) and educational attainment ($\rho = 0.172$, $p = 0.043$), while no substantial relationship was observed with location or income. The findings underscore the need for enhanced information dissemination through community-based education and digital outreach. An Information, Education, and Communication (IEC) material was developed to support awareness initiatives and strengthen institutional collaboration, ultimately improving maternal healthcare access and telehealth utilization.

Keywords: Awareness, pregnant clients, telehealth

INTRODUCTION

Telehealth usage surged by 50% in 2020 due to its convenience and efficiency, especially for remote areas (Bestsennyy et al., 2021; Powell et al., 2017). It showed high patient satisfaction, including among pregnant women (Atkinson et al., 2023; Fleischhacker, 2020; Haleem et al., 2021). While globally adopted, awareness remains low—even in countries like the U.S., Singapore, and the Philippines (Power, 2019; Praveen, 2020; Hossain et al., 2019; Dalisay et al., 2022). In Bayombong, the Region II Trauma and Medical Center offers telehealth services. Still, no study has yet assessed pregnant clients' awareness of its availability—prompting this research.

Asian countries like Thailand and Singapore have integrated telehealth into healthcare (Viriyataveekul, 2020; Ministry of Health, 2023), though awareness remains low (Hossain et al., 2019). In the Philippines, it gained popularity during the pandemic (Bashshur et al., 2016), with DOH, PhilHealth, and NGOs offering services (Cordero, 2023). Awareness influences usage and outcomes (Greenhalgh et al., 2020; Haleem et al., 2021; Kruse et al., 2017; Snoswell et al., 2020). Despite House Bill No. 7422, many remain unaware (Dalisay et al., 2022). In Nueva Vizcaya, RIITMC offers teleconsults, requiring patient awareness and readiness (Gali, 2022; Isotoma Team, 2019; Muzamwese, 2019).

Telehealth caters to those living far away, benefiting pregnant clients who live remotely

(Gao et al., 2022). In the UK, telehealth was rated as good or very good (Quinn et al., 2020), and women expressed satisfaction with virtual prenatal visits (Liu et al., 2021; Peahl et al., 2021). It helps reduce financial burdens by lowering payment costs (Cuellar, 2022). It supports interventions such as smoking cessation, breastfeeding, and weight management during pregnancy (Shmerling et al., 2022). It also supplements mental health care (Cantor et al., 2022) and offers education and counseling through follow-ups (Özkan and Yaman, 2021; Weigel et al., 2020; DeNicola et al., 2020; Kusyanti et al., 2022). It helps manage stress and avoids exposure to nosocomial infections (Pilosof et al., 2021; Farrell et al., 2022). Given the vulnerability of pregnancy (Abu-Raya et al., 2020; News-Medical.net, 2022), telehealth promotes continuity of care and positive outcomes (Kusyanti et al., 2022), supports prenatal compliance, and reduces maternal mortality (Jeganathan et al., 2020; Bridging the Gaps with Telehealth, 2023). Bruno et al. (2023) emphasized its convenience and medical reliability. Still, Atkinson et al. (2023) noted it should supplement, not replace, physical exams. Telehealth remains underdeveloped (Macariola et al., 2021), requiring government efforts to raise awareness and support provider training. Improving services and overcoming barriers can enhance consumer awareness (West, 2019).

Telehealth can expand access to treatment for marginalized communities with geographical and transportation challenges, improving healthcare by providing patients in rural areas access to medical providers at more comprehensive facilities than Health Stations, enhancing health outcomes, and addressing issues like physician shortages and transportation time (World Health Organization, 2010; Batsis et al., 2019; Anderson & Singh, 2021). Age, income, educational attainment, and geographic location are all crucial characteristics that might influence healthtech literacy. By addressing these factors, people can better understand how to use healthtech tools, leading to improved health and well-being (View of Factors Influencing Healthtech Literacy: An Empirical Analysis of Socioeconomic, Demographic, Technological, and Health-Related Variables, 2018).

The literature highlights the development and positive impact of telehealth, especially during the COVID-19 pandemic. It serves as a valuable supplement to in-person visits, providing accessible, flexible healthcare, particularly for vulnerable groups such as pregnant clients. Despite its benefits, many remain unaware of telehealth due to poor communication. Awareness is influenced by factors such as age, location, educational attainment, and income level. Therefore, this study is significant because it aims to determine the level of awareness among pregnant clients regarding the availability of telehealth services in Bayombong, Nueva Vizcaya.

Statement of the Problem

The study aimed to determine the level of awareness of telehealth availability among 139 pregnant clients from Bayombong, Nueva Vizcaya. This study was completed by March 2025. It aimed to answer the following questions:

1. What is the demographic profile of the respondents in terms of:
    1.1 Age;
    1.2 Location;
    1.3 Educational Attainment; and
    1.4 Income Level?

2. What is the level of awareness of pregnant clients on telehealth availability in the municipality of Bayombong, Nueva Vizcaya, in the following areas:
    2.1 General Knowledge;
    2.2 Provider;
    2.3 Schedule;

2.4 Contact Medium/ Platform; and
2.5 Requirements?

3. Is there a significant relationship between the respondents' level of awareness of telehealth availability and their demographic profile in terms of:
3.1 Age;
3.2 Location;
3.3 Educational Attainment; and
3.4 Income Level?

4. What IEC (Information, Education, and Communication) material may be developed based on the results of the study?

METHODOLOGY

This study employed a quantitative descriptive-correlational design. It involved a description of the demographic characteristics of the pregnant clients, their level of awareness of general telehealth knowledge, and the availability of telehealth services in Bayombong, Nueva Vizcaya—providers, schedules, platforms available, and requirements. The study also examined the relationship between respondents' demographic profiles and their levels of awareness.

The research was conducted in Bayombong, Nueva Vizcaya. Central barangays—Bonfal East, Bonfal Proper, Bonfal West, La Torre North, Magsaysay, Don Domingo Maddela, Don Tomas Maddela, Don Mariano Marcos, District IV, Don Mariano Perez, La Torre South, Salvacion, San Nicolas, Santa Rosa, and Vista Alegre. Remote barangays—Casat, Paitan, Ipil Cuneg, Luyang, Bansing, Busilac, Cabuaan, Magapuy, Buenavista, and Masoc. Telehealth is available at Region II Trauma and Medical Center, a tertiary hospital in the municipality. However, no assessment of residents' awareness of this telehealth service had been conducted, providing an ideal setting to gauge pregnant clients' awareness of telehealth availability.

The 139 sample size, derived from the population size of 216 based on the MHO's data, was determined via OpenEpi with a confidence level of ninety-five percent (95%) and a five percent (5%) margin of error. The respondents were selected through stratified random sampling. The population was divided into twenty-five (25) subgroups. The respondents included pregnant clients of Bayombong, Nueva Vizcaya, aged ten to forty-nine (10-49) years, and in their first and second trimesters of pregnancy. Pregnant women in their third trimester of pregnancy, cognitively impaired, beyond the limit of the age range of the MHO data, nonresidents of the Bayombong, Nueva Vizcaya, non-gadget users, illiterate and digitally illiterate, and nonconsensual respondents were excluded.

A structured questionnaire was developed with three sections. Section I collected demographic information—name, age, location, educational attainment, and income level. Section II measured awareness of general telehealth knowledge, adapted from the study by the Jawaharlal Institute of Postgraduate Medical Education & Research (2018), which employed a four-point Likert scale (1=Not Aware, 2=Slightly Aware, 3=Moderately Aware, 4=Extremely Aware). Section III also used the four-point likert scale to measure the awareness of existing telehealth in Nueva Vizcaya—provider, schedule, contact medium/platform, and requirements based on DOH's data (DOH, 2022). The questionnaire was translated into Filipino by Ms. Precious B. Resurreccion, LPT. The instrument's reliability was also assessed using Cronbach's alpha ($\geq$0.91).

Prior to data collection, ethical approval was given by Saint Mary's University Research

Ethics Board. The collected data were analyzed using descriptive and inferential statistics. The frequency-percentage distribution was used to describe the demographic profile of the respondents, and the mean range was used to analyze the level of awareness regarding telehealth availability on a 4-point Likert scale. The following ranges: 3.50–4.00 = *Extremely Aware*, 2.50–3.49 = *Moderately Aware*, 1.50–2.49 = *Slightly Aware*, and 1.00–1.49 = *Not Aware*. In particular, Spearman's Rho was used to examine the relationship between the respondents' demographic profile and their level of awareness of telehealth availability.

The researchers addressed ethical considerations by acknowledging a potential conflict of interest due to their affiliation with the Region II Trauma and Medical Center and mitigating bias by excluding themselves from data analysis related to telehealth services. Participant confidentiality and data protection were ensured through informed consent, data anonymization, encryption, and controlled access, complying with the Data Privacy Act of 2012. Vulnerable participants aged 10–17 were provided with age-appropriate assent and consent procedures involving parents or guardians, with clear communication about the study's purpose, risks, benefits, and rights, and without coercion. Risks such as confidentiality breaches and participant distress were minimized through secure data handling and flexible scheduling. At the same time, benefits included greater awareness of telehealth and improved healthcare access. The research, conducted to fulfill academic requirements at Saint Mary's University without external funding, credits student researchers and faculty advisors, and plans to disseminate findings via social media, community forums, and academic presentations to promote telehealth services for pregnant women in Bayombong, Nueva Vizcaya.

RESULTS AND DISCUSSION

SECTION 1: PROFILE OF THE RESPONDENTS

The majority of respondents were aged 20–49 (82.7%), and most lived in central barangays (64%). Educationally, most had completed high school (33.8%) or were high school undergraduates (24.5%). In terms of income, 46.8% reported having just enough, while 34.5% had inadequate income. Overall, most respondents were younger adults from central areas with secondary education and sufficient income.

SECTION 2: PRESENTATION OF THE RESPONDENTS' LEVEL OF AWARENESS ON TELEHEALTH AVAILABILITY IN TERMS OF GENERAL KNOWLEDGE, PROVIDER, SCHEDULE, CONTACT MEDIUM/PLATFORM, AND REQUIREMENTS

Table 4 shows that pregnant clients are moderately aware of telehealth availability, with a mean score of 2.78, indicating reasonable general knowledge. This supports the findings of Hamed et al. (2022) and Kabir et al. (2024), but contrasts with studies by Power (2019), Hossain et al. (2019), and Dalisay et al. (2022), which found limited awareness among vulnerable groups. The gap remains a barrier to telehealth use (Praveen, 2020; Malhotra et al., 2020), highlighting the need for awareness campaigns and government efforts (Ezinne et al., 2023; Bekyieriya et al., 2023).

Table 4

The Mean Level of Awareness of Pregnant Clients on Telehealth Availability in Terms of Their General Knowledge

	Mean	Standard Deviation	Qualitative Description
General Knowledge	**2.78**	**0.82**	**Moderately Aware**

Statements for General Knowledge Section			
1. Information and Communication Technology (ICT) can be used effectively in health services.	2.87	0.96	Moderately Aware
2. Telemedicine is a branch of telehealth.	2.65	0.99	Moderately Aware
3. Face-to-face interaction between patients and doctors is possible through telehealth.	2.75	0.94	Moderately Aware
4. Telehealth can deliver services in remote areas.	2.70	1.04	Moderately Aware
5. You can send a picture to the doctors for consultation.	2.54	1.05	Moderately Aware
6. Laboratory results, such as ECG and X-ray, can now be sent to doctors to ask for a professional opinion.	2.76	1.09	Moderately Aware
7. Telehealth can be used in the event of disasters such as a pandemic, especially in affected and inaccessible areas.	2.90	0.99	Moderately Aware
8. Telehealth is the use of telecommunications to provide medical information and services.	2.96	0.97	Moderately Aware
9. Patient consultation on proper medication intake can be done through telehealth.	2.91	1.01	Moderately Aware
10. Through telehealth, patients can consult professionals through the internet.	2.80	0.92	Moderately Aware
11. Examination of patients can be communicated through telehealth.	2.81	0.98	Moderately Aware
12. Electronic medical records of patients can be maintained through telehealth.	2.74	0.98	Moderately Aware
13. Follow-ups with patients can be done through telehealth.	2.81	1.02	Moderately Aware
14. Healthcare via the internet is a recognized service.	2.79	0.98	Moderately Aware

Table 5 indicates that pregnant clients in Nueva Vizcaya were moderately aware (mean = 2.64) of telehealth services, especially those by R2TMC, showing some familiarity but limited in-depth knowledge. This limited awareness may restrict full utilization. Supporting studies link awareness to use: Greenhalgh et al. (2020) linked awareness to use; Parameshwarappa & Olickal (2023) cited low eSanjeevani OPD use in India due to limited awareness; and Al-Rayes et al. (2021) reported that increased awareness raised adoption of Saudi's 937 services.

Table 5

The Mean Level of Awareness of Pregnant Clients on the Existing Telehealth in Nueva Vizcaya in Terms of the Provider

	Mean	**Standard Deviation**	**Qualitative Description**
Provider Mean	**2.64**	**1.19**	**Moderately Aware**
Statements for Provider Section			
1. R2TMC provides a telehealth service called "OPD Teleconsult Clinic."	2.63	1.24	Moderately Aware
2. R2TMC's OPD Teleconsult Clinic is a free health service.	2.65	1.24	Moderately Aware
3. R2TMC's OPD Teleconsult Clinic is a way to seek medical advice from professional doctors.	2.66	1.22	Moderately Aware
4. The OPD Teleconsult Clinic includes consultation for pregnant women because the OB-GYNE service is included.	2.63	1.23	Moderately Aware
5. Pregnant women can use the OPD Teleconsult Clinic for prenatal consultations.	2.61	1.25	Moderately Aware

The table indicates that pregnant clients in Nueva Vizcaya have only a slight awareness

of the available telehealth services, particularly regarding scheduling (Mean = 2.33, SD = 1.20). This suggests a need for improved communication strategies to better inform this population about the availability and scheduling of telehealth options. Enhancing awareness is crucial to ensuring pregnant clients can access and utilize these services effectively.

Table 6

The Mean Level of Awareness of Pregnant Clients on the Existing Telehealth in Nueva Vizcaya in Terms of the Schedule

	Mean	Standard Deviation	Qualitative Description
Schedule Mean	**2.33**	**1.20**	**Slightly Aware**
Statements for the Schedule Section			
1. R2TMC's OB-GYNE OPD Teleconsult schedule is every Thursday, 1:00 pm-4:00 pm.	2.24	1.24	Slightly Aware
2. It is necessary to make an appointment before consulting on the stated schedule.	2.42	1.28	Slightly Aware

The table presents that pregnant clients in Nueva Vizcaya have limited awareness, "slightly aware" (Mean = 2.37, SD = 1.24), regarding the contact medium or platform for telehealth services. This suggests that while they possess some knowledge, they need further clarity on who to contact or which platform to utilize for scheduling or accessing services. Improving this understanding is essential for facilitating telehealth adoption among this population.

Table 7

The Mean Level of Awareness of Pregnant Clients on the Existing Telehealth in Nueva Vizcaya in Terms of the Contact Medium/Platform

	Mean	Standard Deviation	Qualitative Description
Contact Medium/ Platform Mean	**2.37**	**1.24**	**Slightly Aware**
Statements for the Contact Medium/ Platform Section			
1. To schedule an appointment at the OB-GYNE OPD Teleconsult of R2TMC, you can contact the nursing attendant, Danley Cabiles, through the hotline number 09673360046.	2.34	1.28	Slightly Aware
2. You can also message their Facebook page "Riitmc Opd Teleconsult" to schedule an appointment and ask questions about this service.	2.41	1.28	Slightly Aware

Table 8 highlights the mean level of awareness among pregnant clients regarding the requirements for accessing telehealth services in Nueva Vizcaya. The findings indicate that their overall awareness is classified as "moderately aware" (Mean = 2.85, SD = 1.19).

Table 8

The Mean Level of Awareness of Pregnant Clients on the Existing Telehealth in Nueva Vizcaya in Terms of the Requirements

	Mean	Standard Deviation	Qualitative Description
Requirements Mean	**2.85**	**1.19**	**Moderately Aware**
Statements for the Requirements Section			

1. A mobile phone/computer/laptop/internet connection is required for effective teleconsultation.	2.83	1.22	Moderately Aware
2. It is also necessary to provide information about oneself, especially the condition and health information.	2.87	1.22	Moderately Aware

The results indicated that most respondents had moderate awareness of telehealth, the provider, and the requirements for using this service. However, respondents have limited awareness of the schedule and the telehealth contact medium/platform at the Region II Trauma and Medical Center.

Table 9

Overall Mean Level of Awareness for Each Section

	Mean	Standard Deviation	Qualitative Description
General Knowledge Mean	2.78	0.82	**Moderately Aware**
Provider Mean	2.64	1.19	**Moderately Aware**
Schedule Mean	2.33	1.20	**Slightly Aware**
Contact Medium/ Platform Mean	2.37	1.24	**Slightly Aware**
Requirements Mean	2.85	1.19	**Moderately Aware**

SECTION 3. Correlation between the respondents' level of awareness of telehealth availability and their demographic profile

Table 10

Analysis of Significant Relationship through Correlation Coefficients and p-Values across Respondents' Level of Awareness on Telehealth Availability and Their Various Demographic Profiles

		Age	Location	Highest Educational Attainment	Income Level
General Knowledge	Correlation Coefficient	**.185***	-0.089	**.172***	0.091
	p-value	**0.029**	0.300	**0.043**	0.288
Provider	Correlation Coefficient	**.174***	0.116	0.016	0.073
	p-value	**0.041**	0.174	0.850	0.394
Schedule	Correlation Coefficient	0.060	0.141	-0.040	-0.022
	p-value	0.481	0.099	0.640	0.796
Contact Medium/ Platform	Correlation Coefficient	0.135	0.114	-0.018	0.044
	p-value	0.114	0.182	0.838	0.608
Requirements	Correlation Coefficient	0.051	0.037	0.045	0.105
	p-value	0.552	0.663	0.601	0.221

A positive relationship was found between age and general knowledge, suggesting higher awareness among older adults. This aligns with the importance of technology for older adults during health crises (Von Humboldt et al., 2020). Similarly, age correlated positively with knowledge of the telehealth provider, indicating that older individuals were more informed about the local telehealth provider, contrasting with the findings that younger individuals were more aware of telehealth (Miyawaki et al., 2021). A positive correlation was also found between the highest level of education achieved and general knowledge of telehealth services. This is supported by Tariq et al. (2023), who found that individuals with post-secondary education were more likely to understand telehealth. Al-Shobry et al. (2024) also added that educated individuals have greater awareness and usage of technology-based services. Umayam et al.

(2022) also shared that educational attainment is a major contributing factor to internet skills (Umayam et al., 2022). No significant correlations were found between general knowledge and income level, or between income level and telehealth awareness.

SECTION 4: INFORMATION, EDUCATION, AND COMMUNICATION (IEC) MATERIAL

The IEC material, derived from the findings, is an informative tarpaulin that can be posted at every barangay health station in Bayombong, Nueva Vizcaya. It consists of: general knowledge about telehealth and its benefits; the primary provider of telehealth in Bayombong, Nueva Vizcaya, along with its requirements, especially for scheduling the service; and the platforms that can be used to access telehealth. The respondents had moderate levels of awareness regarding general knowledge of telehealth, the provider in Bayombong, Nueva Vizcaya, and the requirements for accessing it. Hence, supplementary information is needed in these areas to enable the respondents to be fully aware of its details. In general, the tarpaulin highlighted the consultation schedule for OB-GYNE clients and the available contact channels, as the respondents exhibited low levels of awareness in these areas.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study found that the respondents' level of awareness of telehealth was characterized as moderately high in general knowledge about telehealth, the provider available (R2TMC), and the requirements to access telehealth. These indicate that respondents displayed some familiarity with the concept of using telecommunication technologies for health services, recognizing its potential benefits, including accessibility in remote areas and the ability to consult without physical visits. However, significant gaps remained in the schedule and platform/contact medium awareness.

A notable correlation was found between age and educational attainment with awareness levels. Older respondents and those with higher educational qualifications demonstrated a greater understanding of telehealth services. These insights emphasize the importance of targeting educational efforts toward younger and less formally educated pregnant women. Overall, the results emphasized the need for improved information dissemination through collaborating with the institution, community-based educational campaigns, and digital outreach among pregnant clients. Strengthening awareness initiatives can help optimize telehealth utilization, improving maternal healthcare access and outcomes.

Recommendations

1. Educational forum for the supplementation of the general knowledge about telehealth, and enhancement of the awareness of pregnant clients regarding the detailed information on the existing telehealth in Bayombong, Nueva Vizcaya.
2. A pamphlet containing necessary information about the existing telehealth with simple and easy-to-understand details for pregnant clients.
3. Dissemination to healthcare workers on significant details about the existing telehealth in the municipality to ensure that pregnant clients are informed about their options.
4. Future research can examine the barriers faced by pregnant clients, particularly those who are younger and less formally educated.
5. Collaboration with the municipal mayor to share the study's findings, enabling them to facilitate the dissemination of vital information about available telehealth services,

ultimately enhancing the comfort and experience of pregnant clients during their prenatal consultations.

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