

Original Research Article

## Patient Satisfaction with Telemedicine

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**Abstract:** The COVID-19 pandemic emphasized the significance of telemedicine for delivering healthcare services. However, the rapid development of a framework for telemedicine implementation necessitates the investigation of the existing acceptance and satisfaction of Filipino respondents and physicians. This study assessed the satisfaction of patients with telemedicine in Tuguegarao City in terms of system, information and healthcare service quality. Employing a descriptive quantitative design was used and 230 respondents were included and selected through snowball sampling. A structured questionnaire based on Yip *et al.*, (2003), Bakken *et al.*, (2006), Lin, Z. (2017), and Parmanto *et al.*, (2016) was also used. Gathered data were analyzed using mean, frequency, and percentage while test of significant difference was also conducted using independent sample T-test and One-way ANOVA. Results indicate slight satisfaction among telemedicine users in Tuguegarao City across quality dimensions: system, information, and health service. Moreover, significant differences in the level of satisfaction exist in the respondent's age, educational attainment, average monthly income, occupation, type of residences, and number of health services availed. It was revealed that respondents who are 18 to 24 years old and are commonly senior high school and college graduates had the lower level of satisfaction with the overall quality of telemedicine. While respondents with lower monthly income, in rural areas and who availed more than two services appeared to have better satisfaction with telemedicine services. In conclusion, the results of the study showed that the respondents are slightly satisfied with the telemedicine services within Tuguegarao City.

**Keywords:** Telemedicine, Patient Satisfaction, System Quality, Information Quality, Healthcare Service Quality.

## INTRODUCTION

The World Health Organization (WHO) on March 2020, has declared the novel coronavirus (COVID-19) outbreak a global pandemic. Consequently, it has since challenged the capacity of health systems to deliver services especially among low-and-middle income countries such as the Philippines. A study conducted in the country showed that the implementation of strict social distancing measures and hospitals crowded with COVID-19 respondents have forced other respondents, particularly those who are most likely suffering with chronic illnesses, to stay in their homes (Jaudian *et al.*, 2021). Hence, considering the pandemic, it only magnified the essentiality of telemedicine as an aspect of contemporary healthcare in the Philippines. Telemedicine is defined as the delivery of health services using information and communication technologies, providing valid information for the diagnosis, treatment, and prevention of disease and casualties (WHO, 2022).

Although it has long been introduced in the country, its potential has not been fully realized until the pandemic struck (Macariola, 2021). Currently, the Philippine Health department engaged with more than 100,000 respondents a month in the first quarter of 2021 on Cisco Webex, a video conferencing platform developed by Cisco Philippines (Cordero, 2022). While in a tertiary hospital in Tuguegarao City, at least 1400 respondents availed telemedicine services during the last quarter of 2021. The Department of Health (DOH) recognizes the importance of telemedicine, especially primary care teleconsultation or online consultation in alleviating the surge and minimizing the risks raised by needless hospital traffic, and enabling successful community quarantine (National Privacy Commission [NPC], 2021). As a result, the DOH and

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National Privacy Commission issued a joint memorandum to provide framework guidelines on the use of telemedicine in COVID-19 response. However, the rapid development of a framework for telemedicine implementation calls for the need to engage in studies investigating the existing acceptance and satisfaction of Filipino respondents and physicians with Telemedicine (Elarco, 2021). Moreover, although telemedicine has long been introduced in the country, its potential has not been fully realized until the pandemic struck (Macariola, 2021). Hence, there is a need to evaluate information systems (IS) such as telemedicine in delivering health services to the public. Among the several quality indicators of an information system, patient satisfaction has emerged as the most widely used single measure and indicator of IS success.

To date, there are only 3 local quantitative studies in the country that evaluate respondents' satisfaction with the utilization of telemedicine (Eboña *et al.*, 2021; Cantos *et al.*, 2021; Acierto *et al.*, 2022). Studies by Eboña *et al.*, (2021) and Acierto *et al.*, (2022) showed that Filipinos are generally satisfied with telemedicine. Influencing factors to their satisfaction includes the healthcare provider, system, and technology. However, the study conducted by Cantos *et al.*, (2021) concluded that there is no significant difference between the satisfaction of respondents between conventional outpatient consultation and teleconsultation. This study, therefore, aims to contribute to the limited knowledge about telemedicine and use the outcomes of this study as a quality indicator for the improvement of health systems in the locality.

## METHODS

**Research Design:** A descriptive-quantitative research design was utilized in this study.

### Setting and Respondents

This study was conducted at Tuguegarao City, Cagayan where services of telemedicine were made available for the delivery of health services. It is observed that the predominant means of delivering telemedicine services within the locality is through mobile call and SMS message; while the use of third-party social media platforms is in the discretion of the consulting physician. A total of 230 individuals who experienced utilizing telemedicine services that were offered by hospitals and clinics within Tuguegarao City were included as respondents of the study. The respondents have experienced or received telemedicine services at least thrice and are 18 to 65 years old. The researchers utilized a snowball sampling to gather prospective respondents within the locality.

### Research Instrument

This study used a questionnaire which is composed of two parts: a) profile of the respondent, and b) modified questionnaire from Yip *et al.*, (2003), Bakken *et al.*, (2006), Lin, Z. (2017), and Parmanto *et al.*, (2016) which is divided into three categories: system quality, consist of six questions information, and healthcare services, both consist of seven questions. This questionnaire is a Likert-scale type questionnaire ranging from strongly agree (1) to Strongly disagree (5). To ensure the validity of the questionnaire, face validation was done through a physician practicing telemedicine, and two research experts. The comprehensibility of the questionnaire especially its translation in the local language was evaluated by a language expert.

### Data Analysis

Frequency and percentage were used to describe the profile of the respondents. Mean was used to describe their level of satisfaction on the use of telemedicine. Moreover, independent sample T-test and one-way ANOVA were used in determining whether there is a significant difference between the level of satisfaction when group according to profile variables.

### Ethical Considerations

The present study received ethical approval from USL Research Ethics Board Tuguegarao City, Cagayan Philippines with reference number 011-2023-03 dated April 20, 2023 before the commencement of the study.

## RESULTS AND DISCUSSION

Table 2 shows the profile of the respondents who utilized telemedicine services within Tuguegarao City. Majority of our respondents were female and more than half of them resides in a rural location. Most of them were around 18 to 24 years old while almost half of the respondents are college graduates. Moreover, many of them are unemployed and students with no source of income. Most of the respondents have an underlying medical condition of neuropsychiatric conditions which prompted them to seek telemedicine consultation. Lastly, the table also shows that medical consultation was the most availed health service, and the respondents have frequently used telemedicine 3 to 4 times.

Table 3 shows that respondents who experienced utilizing telemedicine are slightly satisfied in the dimensions or quality indicators of telemedicine such as system, information, and health service quality. Overall, respondents who used telemedicine within Tuguegarao City are slightly satisfied.

**Table 2: Profile characteristic of the respondents**

Variable	Categories	Frequency	Percentage
Age	18 - 24	88	38.26
	25 - 34	63	27.39
	35 - 44	37	16.09
	45 - 54	28	12.17
	55 - 64	11	4.78
	65 and older	3	1.30
Type of Residence	Urban	80	34.78
	Rural	150	65.22
Sex	Male	95	41.30
	Female	135	58.70
Highest Educational Attainment	Elementary	0	0.00
	Junior High School	5	2.17
	Senior High School	65	28.26
	Technical Vocation	38	16.52
	College Graduate	122	53.04
Average Monthly Income	Below 5999	39	16.96
	6,000 – 10,999	37	16.09
	11,000 – 21,999	56	24.35
	22,000 – 43,999	28	12.17
	44,000 – 76,999	4	1.74
	Not applicable	66	28.70
Occupation	Managers	6	2.61
	Professionals	50	21.74
	Services and sales workers	39	16.96
	Skilled agricultural forestry and fishery workers	14	6.09
	Elementary occupations	43	18.70
	Armed forces occupations	7	3.04
	Not Applicable	71	30.87
Underlying Health Condition	Respiratory conditions	39	16.96
	Gastrointestinal and metabolic conditions	16	6.96
	Neuropsychiatric condition	45	19.57
	Musculoskeletal conditions	18	7.83
	Immunologic conditions	6	2.61
	Cardiovascular conditions	18	7.83
	Skin conditions	6	2.61
	Reproductive conditions	21	9.13
	Others (Fever, Pain, Fatigue)	41	17.83
	Good Condition	20	8.70
Type of Services Availed	Medical Consultation	173	75.22
	Medical and Laboratory Diagnosis	45	19.57
	Primary Health Care	34	14.78
	Health Advice and Counselling	133	57.83
	Issuance of Electronic Prescription	90	39.13
Number of times telemedicine was used	3 – 4 times	173	75.22
	More than 5 times	57	24.78
Device used for telemedicine	Mobile Phone	228	99.13
	Tablet/iPad	20	8.70
	Computer/Laptop	52	22.61

**Table 3: Respondents' level of satisfaction towards telemedicine**

Areas	Mean	Description
System Quality	2.46	Slightly satisfied
Information Quality	2.09	Slightly satisfied
Healthcare Service Quality	2.26	Slightly satisfied
Weighted Mean	2.26	Slightly satisfied

The respondents are slightly satisfied with the telemedicine’s system quality characterized by variables such as perceived ease of use, system features, and flexibility. This suggests that the respondents may have had difficulty in understanding the process of the service, such as setting up appointments or how to avail a certain service. Moreover, slight satisfaction with system quality suggests that the respondents had poor experience with the service such as unclear communication, untimely responses of the health worker or lack of flexibility in terms of accessibility of services. The results of our study contradict that of Jaudian *et al.*, (2021) who found that telemedicine services conveniently conserve time in scheduling an appointment and energy in waiting in a long line during outpatient check-ups.

Information quality determined by looking at the output of an information system in terms of reliability, timeliness, accuracy, respect to privacy and trustworthiness had a weighted mean of 2.09, indicating slight satisfaction of respondents. Slight satisfaction in this dimension may indicate that respondents experienced inability to explain their medical problems well during the teleconsultation and at the same time, poor understanding of the medical information provided by the health worker. This may also indicate that the respondents were not able to access health information in their own dialect and not given a chance to freely raise concerns or questions, accordingly. It also suggests that respondents are suspicious of the reliability and validity of information they are receiving from the platform. In our study, information quality of telemedicine scored the lowest in the overall satisfaction of telemedicine. A study conducted by Garcia and Olayele (2018) tried to look closely on the common factors affecting the dimensions of patient satisfaction. In this study, common concerns over the information quality of telemedicine can be linked to the privacy of the patient utilizing it, which impacts their willingness or intention of future use. Moreover, gaps between the expectations and services received can arise due to incompleteness of data transpired during the teleconsultation, and the lack of trust on the information provided by the health worker (Acierto *et al.*, 2022). It is more likely that in our study, contextual factors exist leading to the low satisfaction in the information quality of telemedicine. Societal factors such as the prevalence of misinformation among Filipinos, especially during the pandemic, may have heightened their vigilance towards any health information received in different platforms. The Philippines’ Department of Health (2021) continuously reminds the masses on the dangers of misinformation and encourages responsible pronouncements in relation to the COVID-19 case trend, its new variants, vaccines and other health-related information.

The respondents are also slightly satisfied with health service quality, the degree to which individuals are aware of elements of care that address the maintenance, treatment, recovery, and prevention of conditions connected to their health. This finding suggests that the respondents may perceive poor quality of health services through telemedicine and may have received less attention from health workers. It may also suggest that respondents have experienced lacked establishment of rapport from the health worker during the teleconsultation. This is supported by a systematic review conducted by Harkey *et al.*, (2020), in which it emphasizes the need for program development for training health care professionals, both physicians and nurses alike, in administering health services via telemedicine. A systematic review conducted by Pogorzelska and Chlabicz (2022) found that patients, during telemedicine consultation, reported that they had not been sufficiently asked about their medical history or they had not spent enough time with their physicians. These dimensions serve as quality indicators in the telemedicine system, and in the case of our study, all dimensions were slightly satisfactory. Overall, the level of patient satisfaction of the respondents on telemedicine use in this study is slightly satisfied, indicating that the telemedicine system, information, and service quality is effective but slightly satisfactory.

Table 4 shows that significant differences in the level of satisfaction in terms of different dimensions of satisfaction exist in the respondent’s age, educational attainment, average monthly income, occupation, type of residence, and number of health services availed. These profile variables, like in other studies, have been known to directly affect the level of patient satisfaction with telemedicine.

**Table 4: Significant difference in the level of satisfaction with telemedicine when grouped according to respondents’ profile variable**

Profile Variables	Areas	t/F-value	p-value	Description
Age	System Quality	7.768	0.000*	Significant
	Information Quality	6.101	0.000*	Significant
	Health Service Quality	10.690	0.000*	Significant
	Overall	9.959	0.000*	Significant
Sex	System Quality	-0.268	0.789	Not Significant
	Information Quality	0.092	0.927	Not Significant
	Health Service Quality	-1.055	0.292	Not Significant
	Overall	-0.484	0.629	Not Significant
Educational attainment	System Quality	7.219	0.000*	Significant
	Information Quality	2.605	0.053	Not Significant
	Health Service Quality	6.887	0.000*	Significant
	Overall	6.744	0.000*	Significant

Profile Variables	Areas	t/F-value	p-value	Description
Average monthly income	System Quality	6.367	0.000*	Significant
	Information Quality	1.963	0.085	Not Significant
	Health Service Quality	3.814	0.002*	Significant
	Overall	4.461	0.001*	Significant
Occupation	System Quality	3.702	0.002*	Significant
	Information Quality	1.083	0.374	Not Significant
	Health Service Quality	2.641	0.017*	Significant
	Overall	2.623	0.018*	Significant
Type of residence	System Quality	-2.659	0.008*	Significant
	Information Quality	-1.698	0.091	Not Significant
	Health Service Quality	-1.194	0.234	Not Significant
	Overall	-2.012	0.046*	Significant
Underlying health condition	System Quality	1.233	0.276	Not Significant
	Information Quality	.378	0.945	Not Significant
	Health Service Quality	.515	0.863	Not Significant
	Overall	.505	0.870	Not Significant
Number of health services availed	System Quality	8.944	0.000*	Significant
	Information Quality	2.107	0.100	Not Significant
	Health Service Quality	4.113	0.007*	Significant
	Overall	5.432	0.001*	Significant
Number of Gadgets/devices used	System Quality	.448	0.640	Not Significant
	Information Quality	.813	0.445	Not Significant
	Health Service Quality	.427	0.653	Not Significant
	Overall	.632	0.533	Not Significant
Frequency/Number of telemedicine use	System Quality	-1.664	0.098	Not Significant
	Information Quality	-.370	0.712	Not Significant
	Health Service Quality	-1.519	0.130	Not Significant
	Overall	-1.330	0.185	Not Significant

In terms of age, our research findings indicate that the older population, ages 65 and older, have higher overall satisfaction with telemedicine use compared to other age groups. This coincides with other studies conducted in other countries (Alsabeeha *et al.*, 2022; Sahin *et al.*, (2021) revealing that older persons were very satisfied with telemedicine especially during the COVID-19 epidemic. Older persons believe that telemedicine is as successful as conventional medical care, if not more so, in terms of practicality, chronic illness management which influences their satisfaction (Alsabeeha *et al.*, 2022). However, Kruse *et al.*, (2017) identified that older persons are more likely to be dissatisfied with telemedicine use due to difficulties with technology use, a lack of in-person interaction, and concerns about the quality of care. Many elderly people were unable to arrange appointments with doctors due to technical issues with the internet-based platform, as they had more difficulty deciding where to click to go to the next step when there was no direct and evident indication on the webpage (Kruse *et al.*, 2017). However, it is important to note that the telemedicine technology assessed in this study is the use of mobile phone. The results of this study also contradicts the study of Cantos (2021) which identified that younger patients are more satisfied with telemedicine. Some common reasons for young age groups to be dissatisfied with telemedicine can be attributed to poor interface of the mobile application, inability to listen attentively and the lack of physical examination (Alsabeeha *et al.*, 2022). More importantly, the disparity in the level of satisfaction between the older and younger populations may be attributed to the device or the technology being used for the telemedicine consultation. A study conducted by Macariola (2021) reported that older populations are averse in using new forms of technology such as laptops and computers and usually prefer mobile phones, radio and television compared to the younger population. Hence, to an extent, older respondents had higher satisfaction with the services delivered via call and SMS messaging.

The results of this study also revealed a significant difference in satisfaction to telemedicine according to the number of services availed wherein respondents who used telemedicine services more times are more satisfied those who used this less than 3 times. Although telemedicine was initially used to solve geographic challenges associated with healthcare delivery, it is now obvious that telemedicine may be used for a variety of objectives. Haleem *et al.*, (2021) discovered a favorable association between service variety, accessibility, and satisfaction among telemedicine users. This may be attributed to the convenience of receiving health services (e.g., medical consultation, health advice and counselling, and electronic prescription issuing) in a single sitting or telemedicine visit. To put this into context for respondents receiving specific treatment, Rho *et al.*, (2015) discovered that in diabetic respondents receiving telemedicine services, the number and variety of diabetes management services available through telemedicine are factors influencing patient satisfaction. These studies shed light on the connection between the number of health services received or obtained via telemedicine

and patient satisfaction. These findings show that having access to numerous services can improve patient satisfaction by providing respondents with a larger choice of healthcare alternatives and convenience. The results also revealed that respondents living in rural areas are more satisfied with their telemedicine use than those living in urban areas. This is consistent with the findings of other studies (Levy *et al.*, 2015; Mohammadzadeh *et al.*, 2022; Sangelaji *et al.*, 2017; Sorwar *et al.*, 2016). Respondents living in remote rural regions can save money and time while receiving rapid access to healthcare through telemedicine, which increases patient satisfaction. Rural communities also perceive telemedicine as more cost-effective and time efficient for accessing health services (Sorwar *et al.*, 2016). As such telemedicine must be encouraged more in rural areas (Levy *et al.*, 2015; Sangelaji *et al.*, 2017)

The results of this study also reveal that respondents with lower monthly income are better satisfied with the overall quality of telemedicine than those respondents with lower income. This is supported by findings of other research (Akiyama & Abraham, 2017; Qian *et al.*, 2022). Telemedicine effectively reduces some of the barriers to healthcare information access for respondents with low socioeconomic levels. One of the major factors that affects the satisfaction of patients with telemedicine, especially those who receives low monthly income, is the cost-effectiveness and the significant reduction in the medical expenses of patients offered by the system (Akiyama & Abraham, 2017). Reducing the impact of excessive cost and travel difficulties on low-income respondents made it easier for them to acquire healthcare information (Qian *et al.*, 2022). Moreover, well-off patients are less likely to be concerned of the cost of healthcare services, which also predisposes them to prefer face-to-face consultations over telemedicine (Acierto *et al.*, 2022)

Several limitations must be considered when interpreting the results of our study. First, the evaluation of the telemedicine satisfaction of respondents may be reflective of their experiences in general health and service delivery. This might affect their satisfaction due to their possible preference with face-to-face medical consultation, not solely on the telemedicine service delivery. Moreover, the researchers did not evaluate the implementation of telemedicine system by the health institutions in the locality. Lastly, given that this study was conducted in the post-pandemic world, the study did not inquire on the intention of use of respondents with telemedicine despite the gradual return to the conventional face-to-face medical consultation.

## CONCLUSION

The results of this study show that respondents who utilized telemedicine in Tuguegarao City are slightly satisfied, in all quality indicators such as system, information and health service quality. Among the study's profile variables, significant differences in the level of satisfaction in terms of different dimensions of satisfaction were found in the respondent's age, educational attainment, average monthly income, occupation, type of residence, and number of health services availed. These profile variables of our respondents, like in other studies, have been known to directly affect the level of patient satisfaction with telemedicine. Each profile variable has its contributory factors in both satisfaction and dissatisfaction in telemedicine, which has been discussed in the study. Particularly, this is evident in considering the respondents who were older, who receive lower monthly income and availed three services in one consultation are the ones who reported moderate satisfaction with telemedicine. While variables such as the respondent's type of residence, educational attainment and occupation revealed a slight satisfaction to telemedicine. The slight satisfaction of respondents with telemedicine among three quality indicators suggests that the delivery of telemedicine system in the locality needs further improvement. The result suggests proper adjustments, especially in information quality, must be made by health institutions offering telemedicine within the locality to improve their routine care and health outcomes as a unit. Moreover, the results of this study encourage health units to initiate related programs and activities that seek

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