

Telemedicine Use and Perspectives of Municipal Health Officers in the Cordillera Administrative Region During the COVID-19 Pandemic

Stephanie Joy B. Abnasan-Diong-an, MD; Joseph L. Alunes, MD, FPAFP; Faith M. Garcia, MD, FPAFP and Haydee D. Danganan, MD, FPAFP

Background: Telemedicine has proven essential during COVID-19. However, concerns remain about the rural municipalities in the country such as those from the Cordillera Administrative Region (CAR), wherein perceived barriers by Municipal Health Officers (MHOs) include poor internet connectivity and inadequacy of the current telemedicine service.

Objective: This study aimed to assess the extent of Telemedicine use and perspectives in terms of perception, attitudes and perceived barriers among MHOs in CAR during COVID-19

Methods: This is an analytical cross-sectional study that used a validated online questionnaire to 62 MHOs and DTTBs in CAR. Logistic regression analysis was employed to determine the effect of sociodemographic factors and physician perceptions and attitudes on the extent of Telemedicine use.

Results: Most MHOs use Telemedicine frequently in their practice for 0-1 year during COVID-19. There is no significant effect of sociodemographic factors to the extent of Telemedicine use except for IT expertise which had a negative influence on the extent of use [prevalence ($p=0.011$), frequency ($p=0.013$), length of use ($p=0.044$)]. Generally, MHOs agree that telemedicine is beneficial for them in performing consults with a positive effect on frequency ($p=0.004$) and length of use ($p=0.009$). There is positive attitude towards telemedicine, however, with no significant effect on extent of use ($p=0.352$, $p=1.00$, $p=0.484$). Compromised decision-making and network issues are the most prevalent perceived barriers that limit MHOs to practice Telemedicine.

Conclusion and Recommendation: This study showed that during COVID-19, there is good utilization of Telemedicine among MHOs in CAR. MHOs perceive Telemedicine as beneficial in their work and positive attitude remains. However, presence of barriers makes them apprehensive to fully incorporate it in their practice. Study results can contribute to policy-making on telemedicine as it is a key player in e- health to improve access to healthcare services in the attainment of the goal of Universal Healthcare.

Key words: Telemedicine perspectives, municipal health officers, COVID-19

INTRODUCTION

In the Philippines where geographical barriers and lack of health workforce remain a challenge, telemedicine is seen as one solution for the provision of health services in outlying rural areas.^{1,2} In support of the Universal Healthcare Act, establishing the Philippine E-health system and services is seen as an essential key player in order to

ascertain the mandate of Universal Healthcare of "Health for All."^{3,4} The government's efforts on telemedicine in the country started in 1998 with the founding of The National Telehealth System (NTS) or the National Telehealth Services Program (NTSP), which is a collaborative project of the Department of Health and the University of the Philippines- Manila (UP Manila) developed and managed by the National Telehealth Center (NTHC), a research institute within UP Manila.¹ NTS provides access to specialty care in remote areas through a telemedicine platform that connects primary care physicians to clinical specialists. In the Cordillera Administrative Region (CAR), this platform, has reached

Department of Family and Community Medicine, Baguio General Hospital and Medical Center

54 of the 75 target sites of the region.^{1,5} Moreover, the advent of the COVID-19 pandemic has opened opportunities for telemedicine to flourish globally. This avenue has facilitated healthcare service delivery while minimizing physical contact between patients and healthcare providers.^{6,7} Physicians have used various telemedicine service with the potential advantages of providing comparable quality care while social distancing.^{8,9,10,11,12} In the Philippines, whereas telemedicine was historically used to connect patients in far-flung areas with specialists and referral hospitals, it has proven indispensable during COVID-19.^{13,14} Moreover, the DOH provided hotlines for Filipinos to access for their medical queries and engaged with private companies to provide telemedicine services in the country.^{15,16} Despite these achievements, concerns remain about the Geographically Isolated and Disadvantaged Area (GIDA) and rural municipalities in the country such as those in CAR, wherein poor internet connectivity and even basic electrical power characterize these areas.^{17,18,19}

Despite efforts made available for the practice of telemedicine, local studies have shown that uptake is quite slow and that underutilization remains among Municipal Health Officers (MHOs) due to perceived barriers such as poor internet connectivity and general inadequacy of the existing telemedicine service.^{20,21} Furthermore, Pasco focused on MHOs perceptions and behavioral intention to use telemedicine with a recommendation that future studies may consider determining actual use, rather than merely the intention to use it.²¹ Moreover, these studies have been done prior to the onset of COVID-19 and there is scarcity of literature on telemedicine use among MHOs during the pandemic and how it will be integrated into their daily routine during COVID-19 and even beyond.²²

As for the MHOs in CAR, who compose the public arm of the primary care network, and provide population-based and individual-based health services, this study was conducted to understand how to manage MHO expectations of telemedicine, in order to maximize its use during the COVID-19 pandemic and even beyond since telemedicine is included in the scope of eHealth, which is one of the enabling strategic instruments of the Universal Health Care mandate of "Health for All."^{23"} If this is addressed, the benefits of using telemedicine might be fully maximized by MHOs which may consequently strengthen their engagement and support of telemedicine as an enabler in the improvement of individual-based health services provision and strengthening of universal health care.^{1,24} Study results may be useful to formulate solutions to current challenges in implementation and develop policies and guidelines, especially in support of the existing Universal Healthcare Act and to push for the e-Health System and Services Act of 2020^{3,4}, especially in the development and implementation of capacity building plan for health providers, specifically the Municipal health officers on the use of telehealth services as part of improving primary healthcare services in underserved areas of CAR. This study was conducted to determine the extent of telemedicine use among Municipal Health Officers (MHOs) in the Cordillera Administrative Region (CAR) and their perspectives in terms of perceptions, attitudes, and perceived barriers to telemedicine use.

This study aimed to determine the extent of telemedicine use among Municipal Health Officers (MHOs) in the Cordillera Administrative Region (CAR) and their perspectives in terms of perceptions, attitudes, and perceived barriers to telemedicine use.

METHODS

This is a cross-sectional study which used multi-centric online survey conducted via Google forms through purposive sampling through total enumeration to determine perspectives of MHOs in CAR regarding telemedicine. For the purposes of this study, telemedicine pertains to the use of information technology services available in the country and other audio and visual-conferencing platforms for the conduct of medical consultations as well as referral of patients to specialty centers.

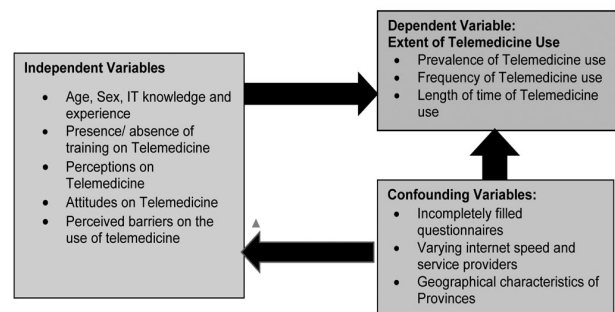


Figure 1. Conceptual framework

This study was conducted in the Cordillera Administrative Region from July- October, 2022 after approval from the institutional technical review board and research ethics committee.

The study participants included the municipal health officers and doctors to the barrios of the Cordillera Administrative Region.

The inclusion criteria are as follows:

- Currently employed as MHO or Doctor to the Barrios with at least 6 months active service during the conduct of the study.
- Willing to participate in the survey.

The following are the exclusion criteria:

- MHOs who are on leave during the data collection.
- MHO with < 6 months of active service.

Total enumeration was employed since the size of the population that has the particular set of characteristics that we are interested in is very small. In total, all the 76 MHOs and doctors to the barrios currently employed in CAR as since they fit the particular set of characteristics based on the identified inclusion criteria. MHOs who have consented were enrolled in the study.

The questionnaire utilized was adapted from 5 studies on Telemedicine use and perspectives of healthcare providers and was modified to fit the MHOs context.^{10,20,21,25,26} Content validation by 4 experts (research consultant, head of a hospital Medical Information System (MIS), chief of hospital of a tertiary hospital in Benguet, and a city health officer) ensued with an average validity score of 4.43, interpreted as highly valid. The questionnaire was revised accordingly to incorporate the comments, suggestions, and recommendations of

the content validators prior to reliability testing. Subsequently, pilot study was done to 34 primary care physicians working in CAR who are not employed as MHOs. Cronbach's alpha was computed with a score of 0.9, which is interpreted as good internal consistency. All amendments to the online survey questionnaire as a result of validation and pilot testing were incorporated into the final version of the questionnaire.

Upon opening the link of the questionnaire provided to the MHOs, an introduction of the research and its objectives were written on the 1st part of the questionnaire. Respondents were asked to read the informed consent which is attached to the questionnaire. If willing to participate, the participant can proceed to answering the questionnaire. An "I agree to participate" button or tick box at the end of informed consent which will enable the participant to proceed to the questionnaire section. Agreement to participate in the study, after reading the informed consent form, and submission of the accomplished online questionnaire was accepted as implied consent from the participant. Also included in this part of the questionnaire were the demographic data of the MHOs and DTTB's which included sex, age, ICT knowledge and experience, and presence or absence of training on telemedicine.

The 2nd part dealt with Telemedicine use which asked if MHO is using Telemedicine during Covid-19, length of time using Telemedicine, frequency of Telemedicine use, communication applications used, and telemedicine platforms offered by service providers. These questions were answered by clicking the button before the statement that applies to them. All of the items required one answer only.

The 3rd part of the questionnaire dealt with the physician user's perspectives on Telemedicine use using 5-point Likert scale questions which consists of 17 items that cover performance expectancy, social influence, facilitating conditions, effort expectancy and attitude.

The last part of the questionnaire asked MHOs to select the option/s that they think are barrier/s to their practice of telemedicine. Multiple answers may apply. There was also a box where they can input an answer on perceived barriers which are not included in the options. To ensure complete answering of the questionnaire, researcher utilized the "Required" button to make a question required such that respondent can only submit his/her response once all questions in the questionnaire are answered.

All data collected in the questionnaires were coded with the use of a coding manual Microsoft Excel v 2010 as the main data management tool in the study. The encoded data were transcribed into MS Excel. Statistical analysis was done using the software Statistical Package for Social Sciences (SPSS) 25.0 version. All categorical variables were expressed as frequency and percentages while continuous variables were expressed as means. The effect of sociodemographic factors and perceptions and attitudes on telemedicine use on the actual use of Telemedicine were measured using logistic regression analysis. A p-value <0.05 is considered statistically significant. The outcome or dependent variable, which is the extent of telemedicine use, was regressed with sociodemographic factors and perceptions/attitudes.

The study was implemented after obtaining approval from the Institutional technical review board and research ethics committee. Further, the anonymity of involved participants was maintained. Since there was participation of human persons, guidelines for the protection of human rights outlined in the Association for the Accreditation of

Human Research Protection Program entitled Bill of Rights for Research Participants were followed. Data protection protocol was observed for emails generated during the data gathering by deleting the column of "emails." There was negligible harm or risks involved in this study, only possible inconvenience on the part of the respondents with regard to their time consumed in answering the questionnaire. Upon approval, an endorsement letter from the Family and Community Medicine department head together with the certificate of approval to conduct research from the Ethics Review Committee were personally sent by the researcher to Provincial Health Officers (PHOs) to encourage participation from the MHOs. It was emphasized that individual consent to participate will be observed in respect of the MHOs autonomy.

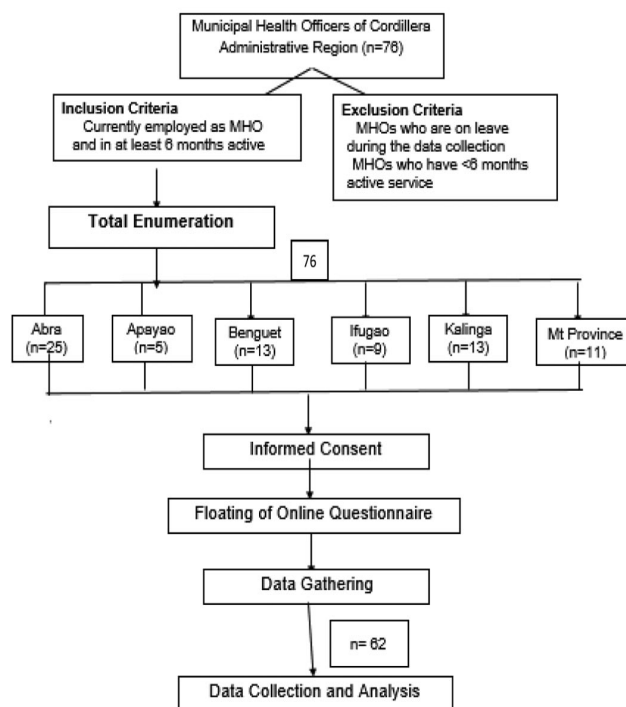


Figure 2. Algorithm of the Study

RESULTS

A total of 62 MHOs in CAR agreed to participate in the study and accomplished the online questionnaire with 82% response rate, which is considered acceptable, wherein in 60% is the acceptable response rate which should be the goal of researchers and certainly are the expectation of the Editor and Associate Editors of the American Journal of Pharmaceutical Educations.²⁷

There is higher female: male ratio and almost half of the study participants are within 40-50 years old. Most of the MHOs have advanced ICT Knowledge and experience. Less than half have received at least one basic Training on telemedicine. Majority of MHOs have been using Telemedicine in their practice during COVID-19 and most of them use it frequently and have been using it for 0-1 year. (Table 1)

Table 1 . Socio demographic characteristics and extent of telemedicine Use by MHOs.

Survey respondent's characteristics		N (%)
Sex	Female	45 (72.6%)
	Male	17 (27.4 %)
Age	< 30 years old	2 (3.2%)
	31-40 years old	16 (25.8%)
	41-50 years old	27 (43.5%)
	51- 60 years old	16 (25.8%)
	> 60 years old	1 (1.6%)
ICT knowledge and experience	Beginner	1 (1.6%)
	Intermediate	7 (11.3%)
	Advanced	54 (87.1%)
Presence of training received on telemedicine	Yes	28 (45.2%)
	No	34 (54.81%)
Extent of telemedicine use by MHOs		N (%)
# of MHOs using telemedicine during COVID-19		46 (74.2%)
Frequency of telemedicine use during COVID-19	Frequently (>1 per month or >12 times per year)	27 (43.5%)
	Occasionally (1-12 times per year)	19 (30.6%)
	Never	16 (25.8%)
Length of telemedicine use (in years)	0-1 year	30 (38.4%)
	2-3 years	18 (29%)
	>3 years	14 (22.6%)

Generally, MHOs agree that telemedicine is beneficial for them in performing consultations (performance expectancy) but have neutral perception in terms of effort expectancy, social influencers and facilitating conditions. Moreover, there is a positive attitude towards telemedicine wherein MHOs agree that telemedicine is a good idea and that it makes work more interesting for them. (Table 1)

Compromised decision-making due to inability to examine patients personally, concerns regarding loss of effective communications between doctors and patients as well as network issues are the most prevalent perceived barriers by MHOs that limit them to practice Telemedicine. However half or more than half of the respondents consider insufficient infrastructure support for medicine, lack of available technology experts to consult when technical issues arise, lack of suitable training on Telemedicine and lack of policy support as barriers. (Table 3)

There is no significant effect of age, sex, and presence or absence of training in the extent of Telemedicine use among MHOs. However, among the sociodemographic factors, only IT experience and knowledge had a significant effect on telemedicine use, length of use and frequency of use. MHOs who are advanced in IT knowledge and experience have significantly shorter use and less frequent use of Telemedicine. Regarding MHO perceptions, among the constructs, performance expectancy or the degree to which using Telemedicine will

provide benefits for MHOs in performing consultations, has a significant positive effect on length of use and frequency of use of Telemedicine. The more MHOs agree that using Telemedicine is beneficial to them in performing consults, the more frequently and the longer they are using Telemedicine (p value 0.004 and 0.044, respectively). Despite positive attitude of MHOs regarding Telemedicine, it has no significant effect on the extent of use of Telemedicine. (Table 4)

DISCUSSION

This study showed that during COVID-19, there is good utilization of Telemedicine among MHOs in CAR. MHOs perceive telemedicine as beneficial in their work and positive attitude remains. The MHOs in this study, despite their age and sex and presence or absence of training in Telemedicine, do not possess sufficient variability to produce statistically significant moderators of telemedicine use. Among the sociodemographic factors, only IT experience and knowledge had a significant effect on telemedicine use, length of use and frequency of use. Interestingly, extent of Telemedicine use is negatively influenced by ICT knowledge and experience. MHOs generally agree that telemedicine is useful in their daily work (performance expectancy) with a positive influence on frequency and length of use. Even during COVID-19, perceived barriers by MHOs such as concerns regarding loss of effective

Table 2 . Perspectives of municipal health officers regarding telemedicine.

I. Perceptions	Mean Score	Interpretation
A. Performance Expectancy	Ave Mean Score= 3.51	Agree
1. I find telemedicine useful in my job	3.88	Agree
2. Using telemedicine enables me to accomplish tasks more quickly	3.85	Agree
3. Using telemedicine increases my productivity	3.60	Agree
4. If I use telemedicine, I will increase my chance of getting a promotion.	2.72	Neither agree or disagree
B. Effort Expectancy	Ave Mean Score= 3.49	Neither agree or disagree
1. My interaction with telemedicine is clear and understandable	3.25	Neither agree or disagree
2. It would be easy for me to become skillful at using telemedicine	3.49	Neither agree or disagree
3. I find telemedicine easy to use	3.72	Agree
C. Social Influencers	Ave Mean Score= 3.28	Neither agree or disagree
1. People who influence my behavior think that I should use telemedicine	3.16	Neither agree or disagree
2. People who are important to me think that I should use telemedicine	3.30	Neither agree or disagree
3. In general, my municipal health office has supported the use of telemedicine	3.38	Neither agree or disagree
D. Facilitating Conditions	Ave Mean Score= 3.04	Neither agree or disagree
1. I have the resources necessary to use telemedicine	3.36	Neither agree or disagree
2. I have the knowledge necessary to use telemedicine	3.15	Neither agree or disagree
3. Telemedicine is not compatible with other aspects of my work	2.95	Neither agree or disagree
4. A person or group is available for assistance with telemedicine	2.69	Neither agree or disagree
II. Attitude	Ave Mean Score =3.66	Agree
1. Using telemedicine is a good idea	4.02	Agree
2. Telemedicine makes work more interesting	3.72	Agree
3. I like working with telemedicine	3.25	Neither agree or disagree

Table 3 . Barriers that limit the practice of telemedicine by MHOs.

Barriers	N	%
Compromised decision-making due to inability to examine patients personally	52	83.9
Concerns regarding loss of effective communication between doctors and patients due to distance between the two	44	71.0
Issues Concerning quality of patient's data	36	58.1
Insufficient infrastructure support for telemedicine,	37	59.7
Lack of policy support	31	50
Lack of available technology experts to consult when technical issue arise	37	59.7
Network issues	51	82.3
Lack of suitable training on Telemedicine	36	58.1
Negative attitude of staff involved	8	12.9
Others:		
1. Telemedicine interferes with MHO's busy schedule	1	
2. Art of Medicine is compromised	1	

communications between doctors and patients as well as network issues remain which limit them to practice Telemedicine despite ongoing efforts made by government and non-government implementers alike in improving telehealth. These results may contribute to policy-making on telemedicine as it is a keyplayer in e- health to improve access to healthcare services in the attainment of the goal of Universal Healthcare.

In the study, almost three-fourth of the study participants are currently using Telemedicine in their practice. In contrast, local studies done prior to the pandemic have shown that uptake is quite slow and that underutilization remains among MHOs.^{20,21} A possible improvement in actual use of telemedicine may be explained by the MHOs participating in the COVID-19 response. Among the sociodemographic factors, only IT experience and knowledge had a significant effect on telemedicine

Table 4 . Association between socio-demographic factors, perceptions and attitudes on telemedicine and extent of use of telemedicine.

	Prevalence of Telemedicine Use	Frequency of Telemedicine Use	Length of Telemedicine Use
	Coefficient (CI) , p-value	Coefficient (CI), p-value	Coefficient (CI), p-value
Sociodemographic factors			
Age	0.726 (0.33, 1.63), 0.437	-0.610 (-1.24, 0.02), 0.058	0.0.06 (-5.41, 0.664), 0.34
Sex	1.02 (0.23, 4.41), 0.984	-0.29 (-1.41, 0.84) 0.621	0.02 (-1.09, 1.11) 0.98
ICT knowledge and experience	0.10 (0.02, 0.59), 0.011	-2.15 (-3.86, -4.51), 0.013	-2.18 (-4.22, -0.54), 0.044
Presence or absence of training	1.10 (0.29, 0.30), 0.880	0.528 (-0.48, 1.54) 0.306	-0.58 (-1.57, 0.42) 0.25
Perceptions			
Performance Expectancy	0.82 (0.80, 19.61) 0.093	1.93 (0.61,3.241) 0.004	1.62 (0.40, 2.81) 0.009
Effort Expectancy	0.62 (0.37, 4.17), 0.718	-0.36 (-1.35,0.64), 0.46	-0.73 (-1.64, 0.18), 0.115
Social Influencers	0.56 (0.19,1.64), 0.285	0.19 (-0.66, 10.4), 0.66	0.155 (-0.69, 1.00), 0.721
Facilitating Conditions	0.66 (0.82, 10.49), 0.100	0.46 (-0.51,1.43), 0.353	0.260 (-0.693, 1.002), 0.721
Attitudes	0.612 (0.17, 1.88), 0.352	-0.81 (-1.77, 0.16), 1.00	-0.31 (-1.18, 0.56), 0.484

use, length of use and frequency of use. Whereas IT expertise is considered to be an enabler, however, this was not supported by this study. Interestingly, extent of Telemedicine use is negatively influenced by ICT knowledge and experience. MHOs who have advanced level of IT knowledge and experience have significantly shorter use and less frequent use of Telemedicine. This is supported by the study of Marcelo, wherein among the moderators, age and sex did not have significant positive influence on the intention to use Telemedicine, only IT experience did.²⁵ However, it should be mentioned that only one respondent was considered as lacking ICT experience. Further examination should be done or the questionnaire can be administered to more respondents with limited ICT experience, to determine why this single respondent was able to produce such a significant association. MHOs generally agree that telemedicine is useful in their daily work (performance expectancy) with a positive influence on frequency and length of use with neutral perception in terms of effort expectancy, social influences, and facilitating conditions. Pasco's study, however, identified social influence as the single most important factor that influenced intention to use telemedicine.²¹ In this study, MHOs agree that telemedicine is a good idea and makes work interesting (attitude). A positive attitude towards telemedicine, however, does not have a significant effect on the extent of Telemedicine use. This agrees with Pasco's study that attitude does not significantly affect behavioral intention to use telemedicine.²¹ Even during COVID-19, perceived barriers limiting practice of Telemedicine by MHOs remain, which agree with previous study by Gervacio wherein perceived barriers by MHOs range from technical and infrastructural concerns to social behavior of the users.²¹

These factors should be considered by health IT implementers and policy makers to increase the use and adoption of telemedicine among its target users. With positive attitude of MHOs towards telemedicine, there may be opportunities for collaboration for specialty referral by MHOs to BGHMC as the Apex hospital in CAR through the use of its existing Telemedicine platform.

CONCLUSION AND RECOMMENDATION

This study has shown that during the COVID-19, majority of MHOs in CAR utilize telemedicine. Aside from being beneficial performing consultations, it also enhanced the process of specialty referrals. A positive attitude towards telemedicine among the MHOs was possibly strengthened by the need to limit physical contact to prevent disease spread during the pandemic. However, in spite of the advantages compromised decision-making due to distance and network issues prevail as barriers in fully incorporating telemedicine in their practice. These remain to be addressed while efforts to institutionalize Telemedicine are yet to be actualized. Hopefully, the study results can contribute to the body of knowledge in creating policy for telemedicine as a possible sustainable solution in e- health as part of health systems strengthening to improve access to health services, which is a thrust of Universal Healthcare.

For the study participants, practical efforts can be done to encourage fellow MHOs who are still not using Telemedicine by sharing their best experiences in telemedicine to their colleagues. Their advanced level of ICT knowledge and experience may be harnessed as enablers for the continuous use of telemedicine in their practice. For Telemedicine Service Providers, the study results' implication could be translated in improving existing telehealth infrastructure and improving internet connectivity, especially in the GIDA. For future researchers, a comparative study of Telemedicine use during and after the pandemic may be done to consider the effect of the pandemic regarding the extent of Telemedicine use. Moreover, the effect of area of Physicians' practice and patient preferences regarding telemedicine use could be studied to delineate physician and patient factors. For Policy Makers, the research could contribute as essential input for improving health ICT intended for GIDA and all other regions of the country. Finally, the study results can contribute to the body of knowledge in creating policy for telemedicine as a possible sustainable solution in e- health in strengthening the accessibility of healthcare to every Filipino, which is a thrust of Universal Healthcare.

ACKNOWLEDGMENT

The author expresses sincerest gratitude to her research adviser and mentor, Dr. Haydee Danganan for the critical review and improvement of her research. She would also like to acknowledge Dr. Joseph Alunes and Dr. Faith Garcia, the department head and training officer, respectively, for their guidance and continuous supervision, MHOs and PHOs of CAR who actively participated in order to achieve a high response rate to her research assistants, Frederick Diong-an and Sola Gratia Diong-an, she cannot thank you enough. Finally, she wants to offer this endeavor to God Almighty, who endowed her with the wisdom and perseverance to finish this research. Soli Deo Gloria!

REFERENCES

1. Fernandez-Marcelo P. Formulating the National Policy on Telehealth for the Philippines through stakeholders' involvement and partnership. *Acta Medica Philippina* 2016; 50 (4): 247-63.
2. Lu J, Marcelo P. Assessment of the context for eHealth development in the Philippines: A work in progress from 1997 to 2020. *Acta Medica Philippina* 2020; 55 (6): 682-94.
3. Go L. 18th Congress Senate Bill No. 1803: E-health System and Services Act of 2020. Senate of the Philippines 18th Congress 2020.
4. Tan A, Yap E, Yap V. House Bill No. 10245: An Act Establishing the Philippine Electronic Health or eHealth System and Services in Support of Universal Health Care and Appropriating Funds Therefor House of Representatives 18th Congress 2020.
5. Juban N, Salisi J, Mier A, Mier-Alpano J & Ongkeko Jr A. National Telehealth System, Philippines. World Health Organization & UNICEF/ UNDP/World Bank/ WHO Special Programme for Research and Training in Tropical Diseases, Geneva: Social Innovation in Health Initiative 2020.
6. Centers for Disease Control and Prevention. Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic. CDC 2022.
7. World Health Organizations. Implementing telemedicine services during COVID-19 : guiding principles and considerations for a stepwise approach. WHO 2020.
8. Nies S, Patel S, Shafer M, Longman L, Sharif. Understanding physicians' preferences for telemedicine during the COVID-19 pandemic: Cross-sectional study. *JMIR Form Res* 2021; 5(8): 1-7.
9. Jafarzadeh-Esfehani R, Mirzaei F, Hatam-Ghale F. Telemedicine and computer-based technologies during coronavirus disease 2019 infection; a chance to educate and diagnose. *Arch Iran Med* 2020; 23 (8): 561-3.
10. Mallouf T, Sarvam, P. Physician satisfaction with telemedicine during the COVID-19 pandemic: The Mayo Clinic Florida Experience. *Mayo Clinic Proceedings: Innovations, Quality & Outcomes* 2021; 5(4): 771-82.
11. Malhotra N, Sakthivel P, Gupta N, Nischal P. Telemedicine: a new normal in COVID era; perspective from a developing nation. *Postgrad Med J* 2020.
12. Damico N, Deshanem A, Kharouta M, Kumar A, Choi S, Bhatt A. Telemedicine use and satisfaction among radiation oncologists during the COVID-19 pandemic: Evaluation of current trends and future opportunities. *Adv Rad Oncol* 2021; 7 (100835).
13. Department of Health. Telemedicine Initiative Strengthens Provisions of Primary Healthcare Services. *Republika ng Pilipinas DOH Kagawaran ng Kalusugan* Aug 2020.
14. Cruz-Lim E, Co H, Mendoza M Iii P, Lucero J, Yap B. Physicians' perceptions on the role of telemedicine in cancer care during and post-COVID-19 pandemic. *Acta Medica Philippina* 2021; 55: 265-70.
15. Department of Health. Department of Health Memorandum Circular No. 2020-0016. *Republika ng Pilipinas DOH Kagawaran ng Kalusugan* 2021.
16. Macariola A, Santarin T, Villaflores F, et al. Breaking barriers amid the pandemic: The status of telehealth in Southeast Asia and its potential as a mode of healthcare delivery in the Philippines. *Front Pharmacol* 2021; 12 (754011).
17. Catral C. Tell-A-Med: The trials and triumphs of going online in medicine. *UP College of Medicine* 2021.
18. Combi C, Pozzani G, Pozzi. Telemedicine for developing countries. A survey and some design issues. *Appl Clin Inform* 7 2016; (1025). Retrieved April 2022 from <http://www.ncbi.nlm.nih.gov/pubmed/27803948>
19. Almathami H, Khin T, Vlahu-Gjorgievska E. Barriers and facilitators that influence telemedicine-based, real-time, online consultation at patients' homes: Systematic literature review. *J Int Med Res* 2020.
20. Gervacio T. Factors influencing use of telemedicine by primary care physicians. *17th National Health Res Forum for Action* 2018; 114-5.
21. Pasco P. Physician user perspectives in the practice of telemedicine in the Philippines. *J Int Soc Telemed ehealth* 2016; 4(16): 1-9.
22. Dela Cruz L, Tolentino L. Telemedicine implementation challenges in underserved areas of the Philippines. *Int J Emerg Techn Adv Eng* 2021; 11 (7).
23. Republic of the Philippines. Republic Act 11223: An Act Instituting Universal Health Care for all Filipinos, Prescribing Reforms in the Health care System, and Appropriating Funds Therefor. *Official Gazette* 2019.
24. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). Policy Framework Analysis of eHealth and Telehealth in the Philippines. *GmbH* 2021.
25. Marcelo P, et al. Factors affecting adoption of a telemedicine device by primary care health workers in the Philippines. *Acta Medica Philippina* 2022; 56(11).
26. Venkatesh V, Thong J, Xin X. Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly* 2007; 36 (1): 157-78.
27. Fincham JE. Response rates and responsiveness for surveys, standards, and the journal. *Am J Pharmaceut Educ* 2008.