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COVID-19

The practice of teleneurology in the Philippines during the COVID-19 pandemic

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Abstract

Background and objectives The practice of teleneurology provided an accessible and safe method of consultation during the COVID-19 pandemic. We aimed to describe the practice of teleneurology among Filipino neurologists and determine the factors affecting its adoption using the unified theory of acceptance and use of technology (UTAUT) model and its constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions.

Methods This was a cross-sectional survey conducted online last October 2020 involving adult and pediatric neurologists in the Philippines. The internal consistency of the questionnaire adapted from UTAUT model was determined using Cronbach's alpha. We performed logistic regression analysis to determine which constructs of the UTAUT model were significant factors on the intent to practice teleneurology.

Results The study yielded a 28.8% response rate. Among the respondents ($n_1 = 147$), 95.2% ($n_2 = 140$) practiced teleneurology during the pandemic, and 77.6% ($n_1 = 147$) planned to continue it after the pandemic. Teleneurology was mostly done on an outpatient basis on social media platforms via videoconferencing due to easier access for both end-users. The UTAUT model explained 80.9% (95% CI 0.76, 0.86a) of the total variation. Performance expectancy and facilitating conditions affect the intent to use teleneurology.

Conclusions Due to the limited resources and knowledge of its practice, infrastructural support and benefit awareness campaigns would be beneficial to increase its adoption, especially in developing countries.

Keywords Teleneurology · UTAUT · COVID-19

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Introduction

Teleneurology is a branch of telemedicine that is focused on the delivery of health care services through a distance by health care professionals using information and communication technologies for the diagnosis, treatment, and prevention of diseases, research and evaluation, and education of patients and health care providers [1–3]. Its advantages include a wider area of practice, a decrease in medical-related expenses, high patient satisfaction, and provision of educational opportunities [4]. Teleneurology can be conducted in two ways: (1) synchronous (through phone or video call); or (2) store-and-forward (through text message, e-mail, or file exchange) [4–6]. Different neurological subspecialties (Stroke, Epilepsy, Dementia, Movement, Headache, Neuromuscular Diseases) have already utilized teleneurology before and during the COVID-19 Pandemic with promising outcomes [7–22]. The establishment of stroke networks using teleneurology provides early access for patients requiring thrombolysis [7]. Other explored methods of teleneurology are the utilization of self-administered questionnaires for the cognitive screening test for patients with dementia [23], evaluation of disability progression on patients with amyotrophic lateral sclerosis [22], and assessment of limitations in activities of daily living for patients with neuromuscular disease [20, 21]. In patients with multiple sclerosis, their disability status is measured by incorporating data from wearable biosensors measuring average steps per day and applications such as Google Maps ™ that uses satellite imagery to measure the maximum walking distance [18, 19].

In 1998, the Philippines had ventured into telemedicine to provide quality and acceptable healthcare while minimizing the barriers of distance, time, and healthcare costs [24]. However, before the corona-virus disease (COVID-19) pandemic, telemedicine remained underutilized because of inadequate infrastructures, limited specialists, and their inadequate skills in engaging in telemedicine, among others [25].

The success rate on the adoption of teleneurology is dependent on user acceptance. Who is the major driver of this technology [25, 26]. One of the models exploring user acceptance is the Unified Theory of Acceptance and Use of Technology (UTAUT) that has four constructs that can be applied to teleneurology adoption [27]. The first construct is performance expectancy (PE), which refers to the individual's beliefs that using the system will help him attain gains in job performance [27]. Secondly, effort expectancy (EE) is the degree of ease associated with the use of the system [27]. Thirdly, social influence (SI) refers to the degree to which an individual perceives that it is important that others believe they should use the new system [27]. Lastly, facilitating conditions (FC) refers to the degree that the individual believes that an organizational and technical infrastructure exists to support the use of the system [27]. Based on a more recent study, attitude (AT) can be added to the model as this construct can significantly predict intent to use teleneurology [28]. Attitude is defined as the individual's overall affective reaction to using a system [27]. Furthermore, it was revealed that adopter's experience and voluntariness could moderate the effects of the factors [27]. The UTAUT is valid with high internal consistency, robust construct reliability, convergent validity, and acceptable discriminant validity [27, 29–31]. It is also validated in the local setting and showed that social influence is a significant factor affecting telemedicine adoption [24]. In general, the adoption of telemedicine remains low, and abandonment rates are high (75–90%) [32]. Some of the identified barriers are the following: difficulty with physical assessment, lack of user training and acceptance, data privacy concerns, lack of facilities and internet access, and cost [9, 32–35].

Social distancing due to COVID-19 has catalyzed the rapid shift to teleneurology to deliver neurologic care [33, 36, 37]. In the Philippines, telemedicine guidelines were released to ensure the proper conduct of remote health care delivery [33, 37, 38]. A commentary by Sy et al. briefly described the early adoption of teleneurology in a local tertiary hospital highlighting its feasibility [39].

Therefore, this study aimed to describe the practice of teleneurology in the Philippines during the COVID-19 pandemic in terms of their specific telecommunication methods used, data management employed, the process of securing informed consent releasing e-prescriptions, and payment schemes. We also aimed to determine the factors affecting their intent to use teleneurology based on the UTAUT. The study's results could guide efforts in improving teleneurology practice during and beyond the COVID-19 pandemic.

Methods

Study design, participants, and procedure

This was a cross-sectional study that utilized a self-administered electronic survey was made available on Google Forms between October to November 2020 for all the adult and pediatric neurologists throughout the Philippines. Eligible respondents were registered fellows or associates of the PNA practicing anywhere in the country at the time of the study. Those undergoing subspecialty training outside the Philippines during the study period were excluded.

Standard protocol approvals, registrations, and consents

This study is approved by the University of the Philippines Manila – Research Ethics Board (2020–525-01) and endorsed by our local specialty organization, the Philippine Neurological Association (PNA). An implied electronic informed consent was obtained from all the respondents.

Data collection

The survey consisted of 2 parts: (1) Part 1 is an original 22-item checklist based on a review of related literature and key informant interview with experts on telemedicine or teleneurology regarding the practice of teleneurology (i.e., telecommunication methods, data management, informed consent, e-prescription, and billing) and (2) Part 2 adopted the valid and reliable 17-item UTAUT questionnaire [27]. Among the 17 items, the last three questions reflected the respondents' behavioral intention to use teleneurology. All the items in part 2 were answerable using a five-point Likert scale as follows: "strongly agree" = 5, "agree" = 4, "neutral" = 3, "disagree" = 2, "strongly disagree" = 1. One of the items (i.e., Facilitating Condition #3) utilized a negatively stated question and was interpreted reversely. The questionnaire was subjected to pilot testing and was modified correspondingly.

Addressing bias in the survey

We planned to reduce possible selection bias by inviting all fellows/associates of PNA practicing in the Philippines (i.e., total enumeration of the target population) to answer the survey. Response bias was minimized by non-disclosure of the study hypothesis to the respondents. Lastly, to increase our survey response rate and minimize attrition bias, the PNA endorsed the study to all the fellows/associates of the organization.

Data analysis

The following were the study's independent variables: PE, EE, AT, SI, and FC. The dependent variable was the intention to practice teleneurology within six months. The modifiers (i.e., experience and voluntariness) were based on factors with both independent and dependent variables, albeit not causally related. The responses' internal consistency regarding the different constructs and behavioral intent and the survey's global internal consistency was assessed by Cronbach's alpha statistics (i.e., $\alpha > 0.7$ was deemed acceptable). Spearman rank correlation analysis was done to assess which behavioral intent and item per construct best reflected the outcome and constructs. All independent and dependent variables were converted from a 5-point Likert scale to binomial responses (i.e., 0—neutral or disagree; 1—agree), which entered in the multivariate logistic regression modeling. To determine effect modification, stratified analyses were done to check if associations between exposures and outcomes were significant. The coefficient of determination (R^2) of the full model was measured to determine overall quality. The significant construct of behavioral intent to practice teleneurology within six months was identified by examining the OR (95% confidence intervals, CI) in the model. The full model was used because all constructs were deemed important based on the literature review.

Data availability

Anonymized data not published within this article will be made available by request from any qualified investigator.

Results

Included participants

A total of 511 adult and pediatric neurologists were eligible and were invited to answer our survey. There were 149 participants who answered the survey. Two patients with blank responses were identified and excluded. In total, we included 147 participants with responses (n_1) and 140 practitioners of teleneurology whose responses (n_2) were included in the qualitative and quantitative analysis (Fig. 1).

Descriptive analysis

Among the participants ($n_1 = 147$), 39.5% practiced teleneurology before the pandemic, and 95.2% ($n_2 = 140$) practiced during the pandemic, and around 78.2% of them reported an increase in utilization. Only 48.3% were affiliated with an institution with telemedicine. More than half (58%) were self-taught and learned from online courses, webinars, PNA guidelines, AAN guidelines, and their hospitals.

Among the practitioners ($n_2 = 140$), laptops (82.1%) were the most used device followed by smartphones (67.9%), tablets (32.1%) and telephones (6.4%). Videoconferencing is the most preferred method in 87.1% of practitioners, followed by phone call (27.9%), e-mail (22.9%), and short message services (19.3%), respectively. Most preferred to use teleneurology for outpatients (92.1%) over inpatients (20%), and old patients (93.6%) over new patients (52.9%). Among the platforms, the commonly used were Viber™ (53.6%), Facebook Messenger™ (53.6%), Zoom™ (50.7%) and SeriousMD™ (22.1%). Other less frequently employed platforms were the following: Updox™, Vsee™,

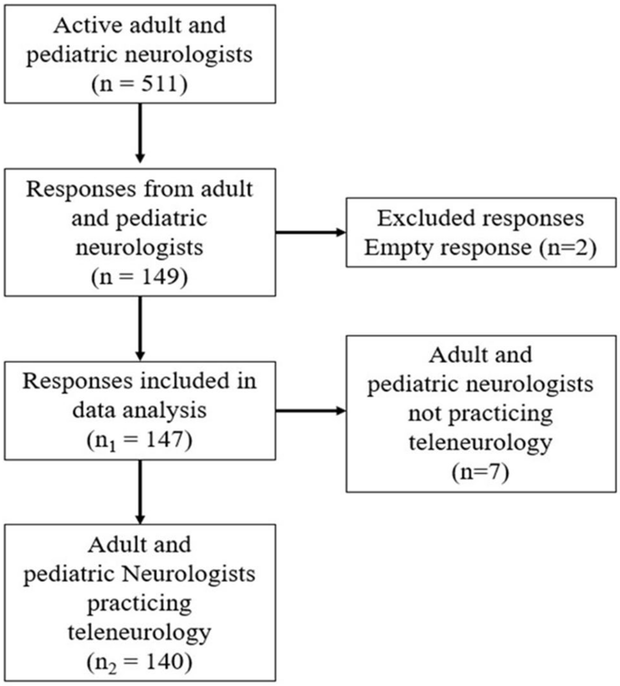

Fig. 1 Flow of participants included in the study

GoToMeeting™, Doxy.me™, Cisco Webex™, Medifi™, HIPS™, CSMC E-consult™, Cloudmd™, MVMC virtual care™, eZconsult™, and Seeyoudoc™. Before a consultation, patient consent was obtained that provides details on limitations (97.9%), process (93.6%), billing (85.7%), disadvantages (80.7%), risks (76.4%), and benefits (73.6%). Consent was still obtained through electronic (57.1%), verbal (39.3%), and written (36.4%) forms, while 28.6% of the practitioners opted for implied consent. Video or audio recording of the consultation was only practiced by 21.4% of respondents. Around 92.1% practiced electronic or physical medical recording systems. The utilization of e-prescription was as high as 98.6% and was delivered via social media applications (64.3%), e-mail (47.9%), or telemedicine platforms (37.9%). Around 65% of practitioners maintained their professional fee rate while 30.7% charged less and 3.6% charged more. Some neurologists preferred to be paid in advance for future transactions (16.42%), while others practiced for free (15.7%). The payment was mostly made through mobile payment (70%) or bank transfer (69.3%); other methods were through other forms of money transfer (21.4%) and telemedicine platforms (15.7%).

Among the participants ($n_1 = 147$), 83% agreed that the major benefit of teleneurology was the efficient use of resources. The other identified benefits were a wider area of practice (70.1%), an increase in the number of patients (37.4%), an avenue for patient education (32.7%), better patient satisfaction (19.7%), and more extensive history taking (19.7%). The identified barriers were performance of neurologic examination (86.4%), conduct of consultation (51.7%), lack of appropriate facilities (47.6%), data privacy concerns (39.5%), data management (38.8%), patient acceptability (27.9%), payment (25.9%), poor connection (25.9%), lack of training (15%), and pre-consultation concerns (5.4%). Despite the identified barriers, 77.6% of the participants still planned to continue practicing teleneurology after the pandemic.

Relationship of UTAUT constructs with behavioral intention to use teleneurology

Table 1 shows the mean Likert scores obtained from the participants. PE, EE, AT, and BI showed an acceptable level of α 0.70 or above. FC had a low internal consistency (α = 0.4156) that can be attributed to the third statement in FC being a negative statement (Telemedicine is not compatible with other aspects of my work) which will tend to have a disagree scores (lower Likert) compared to the other FC positive statements that tend to have agree scores (higher Likert) causing a discrepancy in the direction. However, the overall Cronbach's alpha for the entire questionnaire still had high internal consistency at 0.9333. BI1 correlated with most of the constructs (11 out of 18); hence it was included in the modeling. The following were identified to have the highest correlation with BI1: PE1, EE2, AT3, SI3, and FC1. The adjusted model that excluded experience and voluntariness as confounders explained 80.9% (95% CI 0.76, 0.86) of the total variation in the behavioral intent to practice teleneurology within 6 months compared to the unadjusted model at 62.8% (95% CI 0.54, 0.72 (Table 2). The factors identified among the constructs were PE (OR 37.55; 95% CI 2.59, 543.8) and FC (OR 46.29; 95% CI 1.08, 1,989.23).

Discussion

The majority of the participants have practiced teleneurology during the pandemic utilizing social media applications via videoconferencing through desktop/laptop. Only half of them were affiliated to an institution with teleneurology and had to learn on their own or through their colleagues. Obtaining informed consent is duly observed with disclosure of the benefits, risks, and limitations of teleneurology. A study done in Italy before and during the pandemic also showed neurologists prefer to use laptops and smartphones [17, 40]. These devices are mainly used to obtain health information, contact the medical community, and exchange information with colleagues and patients [17]. They did not cite possible reasons for the preference of phones over tablets. In the Philippines, persons using smartphones

Table 1 Summary of the results of the survey

	Mean score	*Cronbach's alpha*
Performance expectancy (PE)		0.8113
I would find telemedicine useful in my job. (PE1)	4.3	
Using teleneurology enables me to accomplish tasks more quickly. (PE2)	3.6	
Using teleneurology increases my productivity. (PE3)	3.7	
If I use teleneurology, I will increase my chances of getting a raise. (PE4)	3.2	
Effort expectancy (EE)		0.8866
My interaction with teleneurology would be clear and understandable. (EE1)	3.9	
It would be easy for me to become skillful at using teleneurology. (EE2)	4.0	
I would find teleneurology easy to use. (EE3)	4.0	
I would find teleneurology easy to learn. (EE4)	4.2	
Attitude (AT)		0.8734
Using teleneurology is a good idea. (AT1)	4.3	
Teleneurology makes work more interesting. (AT2)	3.6	
I like working with teleneurology. (AT3)	3.5	
Social influencers (SI)		0.8360
People who influence my behavior think that I should use teleneurology. (SI1)	3.6	
People who are important to me think that I should use teleneurology. (SI2)	3.7	
In general, my municipal health office has supported the use of teleneurology. (SI3)	4.2	
Facilitating conditions (FC)		0.4156
I have the resources necessary to use teleneurology. (FC1)	4.5	
I have the knowledge necessary to use teleneurology. (FC2)	4.3	
Teleneurology is not compatible with other aspects of my work. (FC3)	3.0	
A person or group is available for assistance with teleneurology. (FC4)	3.5	
Behavioral Intention (BI)		0.9782
I intend to use telemedicine in the next six months. (BI1)	4.4	
I predict I would use teleneurology in the next six months. (BI2)	4.4	
I plan to use teleneurology in the next six months. (BI3)	4.4	
Global		*0.9333*

AT attitude, *BI* behavioral intention, *FC* facilitating conditions, *EE* effort expectancy, *PE* performance expectancy, *SI* social influencers

Table 2 Multivariable logistic regression modeling of all five constructs adjusting for experience and voluntariness with intent to use teleneurology in the next 6 months

	OR	95% CI	*p*-value
$R^2 = 0.8088$		[0.76, 0.86]	< 0.0001
Constructs			
PE	37.55	[2.59, 543.80]	0.0080
EE	0.98	[0.09, 10.98]	0.9880
AT	3.46	[0.21, 57.16]	0.3860
SI	9.29	[0.69, 125.09]	0.0930
FC	46.29	[1.08, 1,989.28]	0.0460
Confounders			
Experience	9.95	[0.35, 281.02]	0.1780
Voluntariness	186.58	[6.04, 5,763.74]	0.0030

AT attitude, *BI* behavioral intention, *CI* confidence interval, *FC* facilitating conditions, *EE* effort expectancy, *OR* odds ratio, *PE* performance expectancy, *SI* social influencers

outnumber tablet users with a ratio of 2:1, which could explain the preference for smartphones [41, 42].

Physical and/or digital storage of patient-related information is commonly done over video/audio recordings of consult. The utilization of e-prescriptions was high and is mostly sent via social media applications. More than half charged the same fee, and most payments were done digitally. The performance of physical examination and lack of facilities are the most common barriers encountered. Nevertheless, more than half plans to practice teleneurology after the pandemic due to the perceived benefits of the increase in practice and efficient utilization of resources. Our study also showed that the UTAUT model explained significantly the intent to practice teleneurology and is highly influenced by PE and FC.

Their preference for video conferencing can be explained by better clinician-patient interaction through the conduct of a neurologic examination and observation of nonverbal cues compared to telephone consults [43]. Furthermore, videoconferencing provided an acceptable level of performance of the physical examination to help the neurologist in the decision-making. The preference on social media platforms during consultations, albeit with certain privacy risks, can be explained by its wide usage across social status, lesser learning curve, and comparable effectivity [44]. Our findings are also congruent with the study done by Brigo in Italy, where half of the neurologists communicate using social media applications, such as WhatsApp™ and Facebook™ [40]. Although only 30% of the neurologist are in favor and 23% are against this method of communication, more than half of them reported that interaction through social media improved their physician–patient relationship [40]. This behavior is best reflected by the construct of PE that, albeit posing a privacy risk, the use of social media applications helps neurologist attain their job performance, thereby facilitating its adoption [27]. Furthermore, local society guidelines allowed the utilization of less secure platforms provided that the physician and the patient are aware of certain privacy risks [33].

Our study showed that new outpatient consults were less preferred, which could be explained by the physician's difficulty in conducting a physical examination, anxiety with misdiagnosis, and establishing rapport [43]. This, in turn, leaves the physician with uncertainties in the diagnosis; hence more tests are ordered [45]. However, teleneurology can still be utilized to triage, stratify and screen new patients.

Benefits and barriers

As of this writing, one neurologist caters to 175,000 Filipinos aged 15 and above, and nearly all of the neurologists (45%) are practicing in the national capital region [46]. Moreover, the quarantine protocols could have limited neurologists' practice in nearby areas, thus further widening the gap. To address this situation, the neurologists sorted to the use of teleneurology to widen their area of practice. Additionally, teleneurology also provides an avenue for patient education and enables extensive history, increasing patient satisfaction [43, 47]. Most neurologists struggled with the online conduct of the neurologic examination. Moreover, fundoscopic, neuromuscular and vestibular examinations are particularly difficult without specialized equipment or a surrogate examiner [33]. The lack of appropriate facilities, organizational structure, and gadgets also proved cumbersome. Local guidelines state a minimum specification of five megapixels for a camera and a bandwidth speed of no less than 2 Mbps to carry out an effective consultation [38]. Although physicians can meet these criteria, the problem arises from the patient's difficulty accessing appropriate gadgets and adequate bandwidth speed. It was found out that access to telemedicine encounters was lower among racial and ethnic minorities, which can be due to lack of facilities, further highlighting an inequity [47]. These issues are already present in our setting and other countries even before the pandemic and can still be evident today [24]. Maintaining data privacy is also one concern, as the exchange of patient-related information can be compromised with less secure or uncertified platforms. Thus, the explanation of potential risk is necessary when obtaining informed consent before the consultation.

Intention to use teleneurology

Our findings are comparable to the initial study (70%) and are higher than the study done in the local setting by Pasco (58%) and with other studies done during the COVID-19 pandemic [24, 27, 48–50]. It could be that our study was done during the seventh month of the pandemic, wherein most of the neurologists have at least tried using teleneurology and have been exposed to its benefits and barriers.

With the restrictions imposed during the lockdown periods, PE was expected to be the strongest factor for the intent to practice teleneurology since many neurologists perceived its usefulness, as supported by other studies on acceptance of telemedicine done before and during the COVID-19 pandemic [48–54]. Some of its uses include efficient utilization of resources, a wider area of practice, and increase in the number of patients served. Neurologists can overcome the restrictions imposed by local quarantine protocols and expand their practice safely nationwide if patients have access to the technology. Neurologists can also monitor high-risk patients (elderly, multiple comorbidities, and immunosuppressed) without the risk of COVID-19 contagion [44]. Furthermore, teleneurology can provide multiple components of clinical care such as triage, diagnosis, treatment, follow-up, and rehabilitation services [55, 56].

As for FC, our findings showed that the practitioners were more motivated to practice teleneurology when they had adequate infrastructural and organizational support. This effect increased with continued usage as users found multiple avenues for help and support [27]. These findings are similar to that of a previous study done in our local setting before the pandemic [24]. These are also seen in other countries as their fast rate of adopting teleneurology is facilitated by previous experience, available infrastructures, and technology [48–50, 57–59]. Furthermore, the quality of network communication directly affects the adoption of telemedicine, and access to good bandwidth is essential to its adoption [60]. Since its conception, the inherent barrier of telemedicine is the limited access to efficient technical infrastructures, especially in developing countries [1]. This includes instability of power supply, limited internet availability, unreliable connection, computer viruses, limited bandwidth, and operating costs that further limit the exchange of information between the patient and physician [1]. Consequently, poor video quality results in decreased patient engagement, leading to poor patient satisfaction and rapport [60]. Although coming from a developing country, 72.1% of Filipinos have access to a mobile phone with internet, which could have contributed to the adoption of teleneurology [41]. Aside from infrastructures, the presence of a governing body that would support teleneurology is also an essential aspect of FC. In the Philippines, the establishment of the National Telehealth Center served as the groundwork for the practice of telemedicine and released guidelines for physicians supported by various medical associations and specialty societies [33, 37].

Implications for future research and practice

We explored neurologists' experiences and perceptions of teleneurology that could help during and after the pandemic period. Most of the neurologists have at least tried teleneurology and are likely to have developed their style of consultation. Additional qualitative studies can explore neurologists' practices (such as the use of wearable devices) which can provide robust data in the practice of teleneurology in a resource-limited setting. Additionally, health education can be explored, such as experiences of neurologists dealing with inaccurate health-related news and self-diagnosis of patients using this internet [40]. This is more relevant nowadays as patients have easier access to health-related information which could be at times misleading. Furthermore, studies incorporating a larger number of respondents could explore other factors and models to the acceptance of teleneurology. The response rate could be improved by extending the duration of data collection aided by more frequent follow-up of the respondents and utilization of other methods of data collection (personal interview, mail, and downloadable forms).

The current teleneurology guidelines can be modified to include recommendations to promote teleneurology in a resource-limited setting, such as guidance on the selection of appropriate platforms, proper documentation of consults, the establishment of a triaging system for new patients, disclosure of pertinent information before the conduct of teleneurology, consensus with obtaining informed consent, issuance of e-prescription, and payment methods. After identifying the barriers to teleneurology, we can establish different programs to address these, such as training sessions using different telemedicine platforms, conducting an online neurological examination, utilizing questionnaires for specific diseases, and managing medical records. Furthermore, proper allocation of cost-effective infrastructures should be emphasized considering the current state of end-users in a marginalized population.

Limitations

Our study yielded a low response rate of 28.8%; thus, it may be difficult to generalize our findings to all the neurologists in the country. The possible explanations could be that the respondents have difficulty accessing and answering the questionnaire, have an unreliable internet connection, are unfamiliar with the electronic format, forgot to answer the questionnaire during their available time, or are biased to be not interested in the subject. Our sample only included physicians who have better access to the necessary equipment, and patients' perspectives were not obtained. The study was taken at one point of time during the COVID-19 pandemic; hence the context of our findings may not be fully applicable after the pandemic when face-to-face consultations are once again permitted. Lastly, we did not collect information on the respondent's demographics that could have a mediating or moderating effect.

Conclusion

The rapid shift to telemedicine has been one of the unprecedented effects of the COVID-19 pandemic in the healthcare system. Even though it was advocated even before the pandemic, current conditions have pushed telemedicine to the spotlight in exercising a safe and efficient healthcare delivery. We have provided a picture of the practice of teleneurology in a resource-limited setting during the pandemic, which is comparable to the practice on a global scale. The universally perceived benefits and barriers of teleneurology are also applicable in our setting, which can help us promote teleneurology and circumvent potential obstacles. The UTAUT model and the construct of PE and FC provide significant explanatory power on the adoption of teleneurology in a resource-limited setting. Our findings suggest that to promote the use of teleneurology, efforts can be directed towards increasing awareness of its benefits and establishing organizational and infrastructure support. Furthermore, qualitative research such as individual experiences on the practice of teleneurology is also recommended.

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Author contribution All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by all of the authors. The first draft of the manuscript was written by G.T. Pagaling and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Data availability The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Code availability 'Not applicable'.

Declarations

Conflict of interest The authors declare no competing interests.

Ethics approval Approval was obtained from the University of the Philippines Manila – Research Ethics Board (registration number 2020–525-01). The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Consent to participate An implied electronic, freely-given informed consent was obtained from all the participants.

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