




BMJ Open Quality Feasibility, acceptability and impact of a clinical decision support tool among primary care providers in an urban, rural and remote site in the Philippines

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ABSTRACT

Introduction Strengthening primary care helps address health inequities that continue to persist in the Philippines. The Philippine Primary Care Studies pilot-tested interventions to improve the primary care system. One intervention was the provision of a free subscription to an electronic decision support application called UpToDate (UTD) for primary care providers (PCPs), including doctors, nurses, midwives and community health workers (CHWs). This study aimed to (1) assess the feasibility of using UTD as information source for PCPs in urban, rural and remote settings, (2) determine the acceptability of UTD as an information source for PCPs and (3) examine the impact of UTD access on PCP clinical decision-making.

Methods Four focus group discussions (FGDs) and two key informant interviews (KII) were conducted to gather insights from 30 PCPs. Thematic analysis through coding in NVivo V.12 was done using the technology acceptance model (TAM) as a guiding framework.

Results All PCPs had positive feedback regarding UTD use because of its comprehensiveness, accessibility, mobility and general design. The participants relayed UTD's benefit for point-of-contact use, capacity-building and continuing professional development. PCPs across the three sites, including CHWs with no formal medical education, were able to provide evidence-based medical advice to patients through UTD. However, external factors in these settings impeded the full integration of UTD in the PCPs' workflow, including poor internet access, unstable sources of electricity, lack of compatible mobile devices and the need for translation to the local language.

Conclusion UTD was a feasible and acceptable clinical decision support tool for the PCPs. Factors affecting the feasibility of using UTD include technological and environmental factors (ie, internet access and the lack of translation to the local language), as well as the organisational structure of the primary care facility which determines the roles of the PCPs. Despite the difference in roles and responsibilities of the PCPs, UTD positively impacted decision-making and patient education for all PCPs through its use as a point-of-contact tool and a tool for capacity-building.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ An important facet for capacity-building of primary care providers (PCPs) is the provision of access to regularly updated health-related references to help physicians, nurses, midwives and community health workers (CHWs) in the performance of their duties.

WHAT THIS STUDY ADDS

⇒ The clinical decision support tool UpToDate was an acceptable and useful information source for PCPs, including physicians, nurses, midwives and CHWs.
⇒ UpToDate access appeared to be most useful in sites that experience staffing gaps.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Provision of UpToDate access at a national level may potentially address the health inequities in the Philippines.
⇒ External barriers, including the availability of stable electricity and internet access; access to devices such as smartphones, tablets, laptops and desktops and provision of hands-on training on how to effectively use the application, need to be addressed to maximise UpToDate's impact on healthcare providers.

INTRODUCTION

In low-income and middle-income countries, geographically isolated and disadvantaged areas (GIDAs) are vulnerable to inequitable access to quality healthcare.¹ System fragmentation and healthcare worker (HCW) maldistribution contribute to health inequities. The WHO recommends a doctor-to-population ratio of 10 physicians per 10 000 people.² However, there are only 3.9 doctors per 10 000 people in the Philippines, with ratios reaching as low as 0.9 per 10 000 in GIDAs.³ The national average for other HCWs is 8.6



nurses and 4.1 midwives per 10 000 population.³ Workforce shortage compromises the quality of healthcare services, especially in resource-limited settings.^{4,5} In these disadvantaged areas, HCWs are expected to render care to a far larger population despite inadequate access to information, infrastructure, equipment and other health-related resources.^{5,6}

Community health workers (CHWs) are volunteer community members who have no formal medical training. CHWs serve as front-line healthcare personnel and provide basic health services such as identification of health problems, linking the community with healthcare professionals, provision of updated health advice on the prevention and management of basic health concerns, and development of health plans.⁷ These CHWs augment the human health resources needed by the country as they serve as the primary point of care, especially in areas that experience staffing gaps and a lack of professional HCWs. They are involved in health programmes and conduct home visits to encourage uptake of these programmes, including immunisation, maternal care, family planning and prevention of non-communicable diseases. CHWs are also involved in recording patient information, blood pressure monitoring and advising the community on healthy lifestyle practices. CHWs are generally regarded by the community with respect and authority in matters related to health.⁸

Strengthening the primary healthcare system involves systems integration, financing and human resource capacity-building. An important facet of capacity-building of primary care providers (PCPs) is the provision of access to regularly updated health-related references to help physicians, nurses, midwives and CHWs in the performance of their duties. Inadequate access to such resources can broaden the inequity in the delivery of quality healthcare.⁴

Several digital clinical decision support (CDS) resources have been developed. One established CDS tool is UpToDate (UTD). UTD offers many functions such as medical calculators, drug interactions, patient education and the latest, evidence-based medical information.⁹

The Philippine Primary Care Studies (PPCS) was a programme that aimed to strengthen the primary healthcare system in three pilot sites, namely an urban, a rural and a remote site. The programme pilot-tested interventions among patients and PCPs to improve the primary care system, particularly on primary care financing, health information systems, human resources for health capacity building, public and private healthcare provider network formation, and community engagement. Specifically, these interventions are hypothesised to improve quality of primary care, HCW knowledge, patient and HCW satisfaction, out-of-pocket expenditures and administrative efficiency in the three pilot sites.

One intervention tested is the provision of a free subscription to UTD among all PCPs for capacity building and improved primary care delivery. The introduction of UTD as a CDS tool was hypothesised to improve HCW

knowledge and their ability to make evidence-based decisions in managing patients. Given the gap in educational resources, HCW maldistribution and system fragmentation in the Philippines, UTD may improve primary care delivery by providing factual information and management plans in one handy application. PCPs in the three sites were given an orientation on the use of UTD. Regular online meetings were also held twice a month wherein CHWs take turns discussing a clinical case using UTD as their main reference for clinical decision-making and health advice. All PCPs were invited to attend these meetings.

This study aimed to (1) assess the feasibility of using UTD as information source for PCPs in urban, rural and remote settings, (2) determine the acceptability of UTD as an information source for PCPs and (3) examine the impact of UTD access on PCP clinical decision-making.

METHODOLOGY

Study design

This is a qualitative cross-sectional study that assessed the feasibility, acceptability and impact of UTD use among urban, rural and remote PCPs after the provision of a 1-year complimentary UTD subscription from June 2019 to March 2020. FGDs and KIIs were conducted among PCPs in all three sites from April to May 2021.

The study adopted the semistructured interview guide developed by Pokhrel *et al*¹⁰ Box 1 for their research on the perception of HCWs on mobile application-based clinical guidelines. Their authors explored UTD as a tool for the detection and treatment of mental health problems. For this study, unrelated questions were omitted and replaced with questions more specific to the three research sites.

Research sites and participants

The three pilot sites of the PPCS were included in the study. The urban site was the University of the Philippines Health Service (UPHS) which catered to employees and students of the University of the Philippines Diliman. The rural site was situated in the municipality of Samal in the province of Bataan. The remote site was in Bulusan, a fourth-class municipality and GIDA in the province of Sorsogon. The classification of municipalities in the Philippines is based on revenue. Fourth-class municipalities are municipalities with average annual income of 40–60 million pesos (US\$705 000.00–US\$1 050 000.00).¹¹ Both rural and remote sites were composed of a cluster of barangays (small territorial and administrative districts) linked together by a rural health unit (RHU) and a series of barangay health centres (BHCs).

The FGD participants were chosen through purposive sampling. The study included 30 PCPs (physicians, nurses, nursing attendants, midwives and CHWs) who were UTD users in the three sites. The sample size of 30 was based on the recommended sample size to reach

Box 1 Semi-structured interview guide (partly adapted from Pokhrel *et al*)¹⁰

1. Feasibility of UpToDate (UTD) use
 1. How would you describe the nature of your job...
 - ... in terms of your everyday tasks?
 - ... in terms of your work environment?
 2. What challenges do you regularly encounter...
 - ... in your scope of practice?
 - ... in your work environment?
 3. Do you feel that your work environment is conducive for electronic medical software (eg, connectivity, supplies, HRH)?
 4. How do you personally feel towards the use of technology or medical software (ie, EHR, EBM applications, PDAs) for your scope of practice?
2. Acceptability of UTD Use
 1. During the UTD subscription period from June 2019 to March 2020...
 - ... how often would you say you used UTD?
 - ... on which devices were you able to use UTD?
 2. What influenced your decision to use or not use UTD?
 3. What were the main benefits or advantages of using UTD in your practice?
 4. Were there barriers that prevented you from maximizing your use of UTD?
3. Impact of UTD use
 1. Did UTD use influence your performance as a primary care provider? Did it influence...
 - ... clinical decision-making?
 - ... how you conducted assessments?
 - ... how you communicated with patients or colleagues?
 2. Were there instances where you felt UTD use limited your performance? In what ways?
 3. Would you recommend UTD use among primary care providers?
 4. How do you feel UTD or other EBM applications could be better integrated in your Practice?

theoretical saturation as identified by other qualitative health research.¹²

Since UTD usage in the urban site was low among non-physicians, non-users were likewise included as part of the urban cohort. Their involvement in the study sought to reveal potential usage barriers encountered even in well-supported settings such as the UPHS. In addition, two nursing attendants from the urban site only used the application once (during UTD orientation). These two participants were considered as non-users.

Variables and data sources

The main outcome of this study was the feasibility, acceptability and impact of UTD on the PCPs. Effect modifiers included the various roles of the PCPs, their training/educational background and the primary care site. To account for these possible effect modifiers, FGD participants were grouped according to occupation: (1) doctors, (2) nurses, (3) midwives (for the rural and remote sites) or nursing attendants (for the urban site) and (4) CHWs. Four FGDs were conducted for each group, and each FGD consisted of seven participants belonging to the three sites. The groupings were created to capture experiences

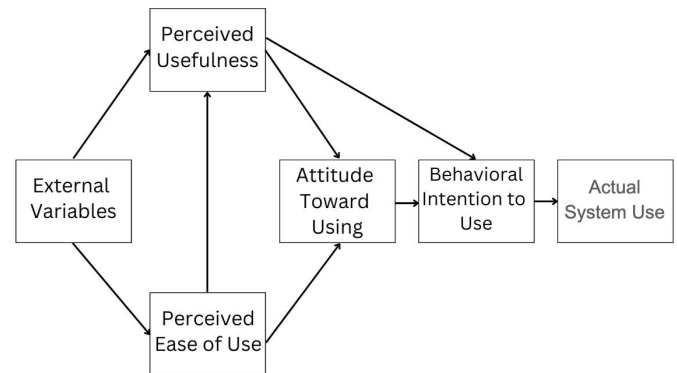


Figure 1 Technology acceptance model.¹²

representative of the four PCP categories. Two KIIs were conducted, with one urban physician and one rural CHW, to meet the 30-participant target for the study.

Data analysis

Recordings of the group discussions and interviews were transcribed and analysed using NVivo V.12. Data were independently coded and thematically analysed by two authors to identify key themes from each FGD. The themes were classified under one of three domains— (1) feasibility of UTD, (2) acceptability of UTD and (3) use and impact of UTD. The themes were analysed per site to fully grasp the context and experience of the PCPs with UTD access and usage.

Data analysis was done using the TAM as the study framework. The TAM shown in [figure 1](#) illustrates the acceptability and attitude of HCWs towards UTD as a CDS tool. The model outlines external variables that influence an individual's perception of the usefulness and ease of use towards a particular technology.¹³ Perceived usefulness is defined as 'an individual's belief that engaging a technology improves their job performance'. Perceived ease of use pertains to the user's belief that the technology platform introduced is simple to operate.¹⁴ Perceived ease of use contributes to the positive evaluation of its perceived usefulness. These two concepts then inform the attitude towards using the technology, the behavioural intention to use it and the actual use of the technology.

RESULTS

There were 207 PCPs across the 3 sites—36 in the urban site, 54 in the rural site and 117 from the remote site. From this, 30 participants were purposively sampled based on UTD use, occupation and primary care site. There were 10 participants each from the urban, rural and remote sites. [Table 1](#) shows the demographic characteristics of the study participants. There were 26 females and 4 males. The median age in years was 41 with a range of 26–65 years. Of the 30 participants, 23 were UTD users while 7 were non-users.

Table 1 Demographic characteristics of FGD participants

	Urban (N=10)	Rural (N=10)	Remote (N=10)
Practice type	n (%)	n (%)	n (%)
Medical doctor	4 (40)	2 (20)	2 (20)
Nurse	3 (30)	2 (20)	2 (20)
Nursing attendant (for urban site)/midwife (for rural and remote sites)	3 (30)	2 (20)	2 (20)
Community health worker	–	4 (40)	4 (40)
Sex			
Female	8 (80)	9 (90)	9 (90)
Male	2 (20)	1 (10)	1 (10)
Age in years*	44.5 (31–65)	40 (30–58)	36.5 (26–48)

*Expressed as median (range).
FGD, focus group discussion.

Feasibility of UTD use

Factors identified by the study participants that affected feasibility of UTD use could be categorised into two: (1) technological and environmental factors and (2) organisational structure and corresponding primary care functions in the workplace.

Technological and environmental factors

All participants raised the issue of poor internet access, with the remote site participants having the greatest difficulty in acquiring good internet access. Given that UTD is primarily accessed through online channels (ie, website or mobile application), the lack of reliable internet service deterred usage. There were 15 out of 24 barangays with weak or no signal in the remote site. In the rural site, there were 3 out of 15 barangays with weak or no signal. Although the internet access in the urban site was generally better, some participants encountered difficulty due to weak Wi-Fi connection in their facility's ward, outpatient department and emergency room (ER). The only participants who did not experience internet problems were physicians who worked from home in a telemedicine set-up, and the rural and remote site nurses who worked in their municipality's RHU.

Another issue raised was the length of time to download the UTD application as an offline version. Participants who downloaded the offline version reported that it took at least 2 hours for the download to be completed. This was especially a concern for those in the upland barangays. Another concern relayed by participants was unreliable electricity sources affecting UTD use, especially in rural and remote settings.

Participants shared that they experienced technical issues with the use of UTD. Although one nurse from the remote site said that assistance from the research staff of the PPCS was available when they needed technical help with UTD, the technical issues extended to the configuration of the application itself. Participants explained that some of the PCPs' mobile devices cannot support the two-gigabyte offline version of the application. This

problem is prevalent for CHWs who generally have older phone models. A midwife from the remote site also said that most of the CHWs do not have smartphones and are not well-versed in technology and smartphone usage.

Another barrier to UTD usage was limited language options. Neither Filipino (spoken in most areas in the Philippines) nor Bicolano (the native language in the remote site) were offered by UTD. Some of the PCPs, particularly the CHWs, had difficulties in understanding UTD, and some relied on a separate translation application to fully grasp the information. Physicians and nurses from the rural and remote sites mentioned that the content may be difficult to understand especially for CHWs who often do not have advanced health education. A CHW from Bulusan relayed that it was difficult to translate the information from UTD into Bicolano so that they could relay it to patients. Even when a translation application was used, the PCPs sometimes reported incongruence between the original statement and the resulting translation.

Organisational structure and corresponding primary care functions in the workplace

UTD use was affected by the organisational structure of the primary care workplace. In the urban site, multiple physicians were always around. Nurses and nursing attendants primarily focused on administrative work like managing patient records, rather than managing individual patients. This lessened the need to use UTD. Furthermore, during the COVID-19 pandemic, patient encounters were restricted to ER consultations where there was limited time to use UTD. Physicians, on the other hand, used UTD more regularly to verify their medical knowledge. One doctor felt that the other PCPs needed to be more involved in their roles as PCPs to motivate them to use UTD. Some participants suggested specialised orientations to increase the usage of UTD.

In contrast, UTD utilisation was highest in the rural and remote sites where the limited number of physicians gave nurses, midwives and CHWs more opportunities to get involved in direct patient care. These HCWs shared

that they often needed to help patients understand the conditions diagnosed by their physicians, as well as the needed treatment. In addition, the attending nurses and midwives in the rural and remote sites were allowed to provide an initial diagnosis and treatment plan for each patient that needed approval by the rural physician, providing even more opportunities to use UTD. One of the rural physicians said that UTD was a big help for the CHWs as well because they were able to give evidence-based advice through UTD. One CHW from the rural site shared that they used UTD to accurately explain prescriptions to patients. Other CHWs explained that they generally seek the advice of midwives and nurses for information on treating patients; however, when nurses and midwives are not available, UTD serves as a reliable source of information.

Acceptability of UTD

Factors identified by the study participants that affected the acceptability of UTD use could be categorised into two: (1) ease of UTD use and its compatibility in existing workflow and (2) the perceived usefulness of UTD for clinical decision-making.

Ease of use and compatibility with existing workflow

All study participants who used UTD perceived it to be a convenient resource for explaining diseases, treatments and home management care to patients. Some of the midwives and CHWs used the 'Patient' tab in UTD, which contained simplified medical information in layman's terms. The participants shared that using the 'Patient' tab helped them relay patient education content in a manner patients could easily understand. The midwives were also involved in facilitating community programmes. They found UTD to be useful in equipping them with knowledge that they could share with the community.

The participants who were able to download UTD for offline use found it very useful. The application could be accessed wherever the participants were. Some of the participants used UTD to read about patient cases during home visits or when they transferred to another barangay health station.

Most of the study participants favoured UTD use. They expressed intent to continue using it in the future if the subscription was maintained. The participants commended it for convenient access, ease of use and intuitive design. The structure and composition of UTD as a CDS system were considered very efficient. Since all data were stored in one application, the participants relayed that it was relatively simple to find the needed information.

Perceived usefulness of UTD for clinical decision-making

The participants relayed that the major benefit of UTD was that it empowered clinical decision-making among the PCPs. All UTD users shared that the application allowed them to give updated, evidence-based care to their patients. UTD helped urban physicians cross-check

the appropriateness of treatment plans for both simple and complex cases. UTD was also a good resource for alternative treatment plans. One urban physician highlighted the importance of getting updated information on common diseases and ongoing clinical trials to help them adjust to the latest medical innovations. The drug interaction feature of UTD was also helpful for physicians dealing with chronically ill patients taking multiple medications.

Midwives and CHWs from the rural and remote sites said that the application boosted their confidence as HCWs. Access to UTD assisted in their decision-making for their patients and communities. The nurses and midwives relayed that UTD provided them with a sense of empowerment. They felt more at ease in giving accurate medical diagnoses and treatment when they were designated these tasks, although their initial diagnosis and treatment would still be subjected to a doctor's approval. UTD was also a big help for CHWs working in BHCs. It guided them on what to teach patients, especially when midwives or nurses were not around.

Use and impact of UTD

The third domain, use and impact of UTD, shows the participants' actual usage of the platform. Under this domain, three aspects of use were identified: (1) UTD as a point-of-contact tool, (2) UTD as a tool for capacity building and (3) UTD as a tool for continuing professional development (CPD).

UTD as a point-of-contact tool

The participants shared that UTD was a useful resource for point-of-contact health advice. One CHW in the rural site shared that she used UTD to help a mother with a child experiencing symptoms of diarrhoea. She could not refer the patient to an attending midwife or nurse since the BHC was closed on weekends. The CHW looked up the symptoms of the child on UTD and gave immediate home care advice to help ease the symptoms. UTD was invaluable to her and to other CHWs. Since their community trusted them as PCPs, they found it important to give correct healthcare advice.

Participants from the rural and remote sites found it useful to have access to information on home care management for certain illnesses that they can share with patients. Since this information was available on UTD, they were able to advise patients well. They could also provide advice on acceptable alternatives if patients had no access to certain medications or treatments. The 'Patient' tab on UTD helped them provide advice to ease the patient's symptoms. The 'Patient' tab also helped them in educating communities for the prevention of diseases. The nurses and midwives reported that they used UTD to help them craft their protocol presentations during community health programmes.

The rural physicians relayed that UTD helped them provide quick responses in primary care. Although UTD was found to be useful in emergency cases for the rural

and remote PCPs, the nurses and nursing attendants in the urban site felt that UTD could not be used in emergency cases.

UTD as a tool for capacity-building

The physician participants from the rural and remote sites mentioned that UTD helped them manage complex cases. One physician from the remote site shared that their health facility often experienced a shortage of medical equipment to allow comprehensive medical evaluation. Thus, they usually refer patients to specialists. However, access to UTD allowed them to search for alternative methods of management. This helped avoid the need for patients to travel far to access specialist care.

Participants found UTD to be useful in the capacity building of the PCPs in addressing COVID-19 cases. The application includes a frequently asked questions section on COVID-19 that is regularly updated. One urban physician said that they used UTD as a reference when they were tasked to discuss COVID-19 vaccinations to the public. They were confident about using UTD since they knew that the application was updated based on recent research findings. They shared that UTD had all the necessary information they needed, in comparison to other medical databases.

UTD for CPD

The participants found that UTD is beneficial for CPD. One urban physician said that nurses may be encouraged to update their knowledge through UTD and earn CPD credits. The nurses, midwives and nursing attendants recognised the usefulness of UTD as a tool for CPD. One nurse from the rural site said that browsing UTD helped them become familiar with common cases they encountered, such as hypertension, diabetes, skin disorders, influenza-like illnesses, pneumonia and asthma. The nursing attendant from the urban site who regularly used UTD said that UTD aided her in her studies since she was pursuing a degree in midwifery.

DISCUSSION

Study participants generally found UTD to be a feasible and acceptable CDS tool, with a positive impact on their various roles as PCPs

Feasibility of UTD use

This study showed that the feasibility of UTD use among PCPs was affected by technological and environmental factors, and organisational structures. This finding was consistent with international studies which stated that adopting UTD as a CDS system in the workplace is heavily reliant on technological and environmental factors.^{13 14} UTD usage can only be sustained with adequate telecommunication infrastructure and access.¹⁵ The availability of technical support and assistance, when needed, was also a major factor that affected the usage of a technological system.^{13 16}

According to a modified version of the TAM for RLSs (TAM-RLS), cellphone characteristics and technology literacy are factors that affect users' perceived ease of use with respect to a technological intervention. Limited battery life, lack of cellular reception, insufficient available storage space, lack of airtime and loss of devices are factors that hinder efficient system use. Previous experience with other technological systems was also an important factor affecting the feasibility of technological applications.¹⁷ This underlies the importance of proper training before the implementation of any technological system. In this study, the HCWs were provided training on UTD use. However, technological acceptance and use took some time, since it was a new intervention with a steep learning curve. Mastery of the platform and adequate knowledge of how to use technological devices to access the platform were needed.¹⁷ This is especially relevant for the rural and remote areas and among older HCWs who were mostly used to more traditional forms of media as their sources of information.

In line with the TAM-RLS, the language used in a technological intervention affected ease of use.¹⁸ Research shows that the unavailability of a preferred language in a given technological platform may make the content more difficult to access.¹⁷ Given that UTD's contents were only available in English, it may be difficult for health professionals whose first language is not English to fully master the content. While most Filipinos are functionally literate in English and it is likely that health professionals understand what is being stated in UTD, they might have some difficulty communicating the information to their patients who are not health experts or might be less literate in English. The work of De Castro *et al* explored the provision of care as a two-way process. It discussed the roles taken on by caretakers and those cared for. Providers need to have access to understandable information that they can use to deliver care to patients.¹⁸ Google Translate has features that allow direct on-screen translation into Filipino. This was a great help in alleviating the language problem. Again, this required some familiarity with handheld technology.

Acceptability of UTD

This study demonstrated that ease of use, compatibility with the existing workflow and perceived usefulness for decision-making are important elements contributing to overall acceptability. Having readily available and easily understandable material is very important aspect of a CDS system and determines the effectiveness of the CDS system.¹⁹ These factors are especially relevant in areas where HCWs are less acquainted with using digital tools to assist in carrying out their duties. A user-friendly and intuitive interface are must-have for a CDS system. In a research report evaluating five bedside information products, providers showed a significant preference for UTD due to certain design issues such as ease of interaction with the system, screen layout and the speed of the database.²⁰

Having the proper telecommunications infrastructure is also pivotal to the acceptability of a CDS system. According to the TAM, 'enabling remote connection' is an important factor in the perceived usefulness of a technological system.¹³

Results of this study demonstrated that the cognitive tasks and reasoning processes of the HCWs in the rural and remote sites were very much supported by UTD. The application helped them improve their roles as PCPs. A randomised trial evaluated four search tools, including UTD, in terms of speed, accuracy and user confidence. Users had the most confidence in the results provided by UTD because of its longstanding reputation as a provider of health information.²¹ This existing evidence and the narratives from this research show the preference for UTD as an evidence-based medical resource.

In RLSs, having go-to information for diverse medical knowledge allowed maximisation of the limited resources available.²² This was especially important during COVID-19 pandemic.²³

Use and impact of UTD

CHWs, as intermediaries of the health system in rural and remote settings given the lack of professional medical doctors in local communities, are generally regarded by the community with a high level of trust.⁸ Doctors mostly work in urban areas which means that rural residents often have to travel hours to see a doctor. This permits non-physician HCWs in rural and remote areas with a good opportunity to provide initial healthcare advice for patients. Nurses, midwives and CHWs also do home visits to promote community health.²³ This study demonstrated that UTD was found beneficial not just by physicians, but by nurses, midwives and CHWs as well.

A health facility's ability to provide patients with quality, timely and accurate care leads to improved trust of patients in the service providers. Patient trust affects the willingness of patients to seek healthcare, adherence to treatment instructions and access to continuity of care.²⁴ UTD helps in this regard as HCWs use this to provide evidence-based advice.

UTD may also be a useful electronic resource in continuing education (CE). Evidence shows that UTD was associated with improved performance during in-training examinations and assessments for maintaining medical certification.^{25 26} However, what makes UTD a CPD pathway worth recognising is its capability to quickly provide the latest evidence-based information on clinical knowledge. The ability to offer relevant and evidence-based content is one of the main principles that make a CPD scheme effective.²⁷

Earning a minimum of 45 CPD credits is one requirement for license renewal in the Philippines.²⁷ CPD is also especially beneficial for the HCWs in rural and remote sites since access to medical training may be limited in these areas. The problem is that the Philippines is not on the list of countries that recognise UTD as an accredited CE resource.²⁸ Subscribers of UTD can earn continuing

medical education, CE or CPD credits through the application.²⁹ The credits feature is available on the homepage and settings page of the application or website. It remains worth exploring as it is one of the software's assets. Recognition of UTD as a means of access to CPD will allow users of the application to translate their earned CPD units into licensure renewal and updated primary care practice. Recognition of CPD units from UTD may also potentially encourage more HCWs to use the application as an evidence-based medical resource in providing primary care.

Limitations

This research explored the experience of PCPs with UTD in urban, rural and remote settings. Due to the COVID-19 pandemic, all FGDs and KIIs were conducted virtually to avoid the risk of viral transmission. The online method of data gathering may have affected the quality of the responses collected. A few participants had unstable internet connectivity during the call. Some participants got disconnected in the middle of the discussion, although the facilitator made sure to include them back in the discussion once they rejoined the call.

Another limitation of the study is that the FGDs and KIIs were conducted 1 year after the free UTD subscription ended. The UTD subscription was provided to the PCPs from June 2019 to March 2020. The 1-year gap may have resulted in imprecise recall of experience with UTD usage. It is also worthwhile to note that all sites were provided institutional access to UTD for free. The lack of expenses involved may have contributed to a more favourable experience with UTD.

There were also variations in PCP distribution across sites for each of the FGDs. The varying number of PCPs representing each site for the FGDs may have affected the dynamics of the FGDs. Lastly, the small number of participants precludes general conclusions to be drawn from this study.

Overall interpretation

This study shows that UTD has the potential to improve healthcare services. It can provide comprehensive health information for HCWs, it can be a resource for CPD, it can improve patient-provider relations, and it can empower HCWs by helping them in clinical decision-making. UTD can work as an efficient and effective CDS given its many functions. However, its integration into the workplace relies on many different external factors. Institutional support is also needed to motivate HCWs to seek CE and professional development to improve their capacity as PCPs.

The results of this study may be useful for other settings which have similar health systems. However, it is important to consider that feasibility, acceptability and impact are affected by cultural, social and economic factors; thus, study results must be cautiously studied for their external validity.

CONCLUSION

This study demonstrated that the provision of UTD access was generally regarded favourably by all PCPs, including both physicians and non-physicians. The feasibility, acceptability and impact of UTD manifested in the PCPs' integration of UTD into their workflow, allowing them to provide evidence-based care for patients with increased confidence. UTD access appeared to be most useful in sites that experience staffing gaps, namely the rural and remote sites.

Factors affecting the feasibility of using UTD include technological and environmental factors (ie, internet access, electricity, compatibility of mobile devices and the lack of translation to the local language), as well as the organisational structure of the primary care facility which determines the roles of the PCPs. UTD was considered an acceptable and useful information source for all PCPs, including physicians, nurses, midwives and CHWs who generally do not receive formal training. This provides a tremendous boost to the primary care system that is heavily dependent on these community volunteers. Despite the difference in roles and responsibilities, UTD was regarded to have a positive impact by all PCPs through its use as a point-of-contact tool and a tool for capacity-building. A larger scale UTD research study is currently being planned to evaluate the impact and utilisation of UTD in the Philippines.

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