

The Effect on Patient and Health Provider Satisfaction regarding Health Care Delivery using the Teleconsultation Program of the Ateneo de Zamboanga University-School of Medicine (ADZU-SOM) in Rural Western Mindanao

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ABSTRACT

Objectives. This study aimed to determine the effect of a Teleconsultation Program on health care provider and patient satisfaction regarding health care delivery. It is a descriptive cohort that described the satisfaction of health care providers and patients with the combined web (moodle) and Short Message Service (SMS)-based system of teleconsultation of the ADZU-SOM.

Methods. This is a prospective cohort that included Municipal Health Officers from Region IX and Sulu and their patients. Questionnaires on satisfaction with the Teleconsultation program was given and filled up. Utilization of the mode of teleconsultation was monitored.

Results. The study included 8 municipal health officers and 39 patients who completed questionnaires on satisfaction with the Teleconsultation program. Only 35% of physician-respondents and 36.4% of patient-respondents returned the questionnaires. The most common method of referring is through mobile phone SMS. High satisfaction rating was noted by both health providers and patients but concerns were raised regarding the costs of the system. The respondents felt that privacy issues were kept confidential with the system.

Conclusion. In conclusion, given the preference for mobile phones among Filipino rural physicians in municipal health units, telemedicine applications should be developed specifically for use in that platform.

Key Words: telehealth, telemedicine, rural medicine, information technology, teleconsultation, cell phones, mobile phones, patient satisfaction, health provider satisfaction

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Introduction

In 1994, the Ateneo de Zamboanga University - School of Medicine was established to produce doctors attuned to solving the health problems of region IX. It has revolutionized traditional medical training into a community-based medical program that exposed its students to the realities of community-based practice early in their training. From the time the first batch completed its training in 1998 to 2007, 110 graduates have obtained their physician's licenses with only 5 graduates moving abroad. The rest practiced in the region, with some undergoing specialty training and eventually settling in nearby communities. The majority were assigned to remote communities acting as the sole health officer in the area. However, due to the poor health and social infrastructure in these remote areas compounded with inadequate medical supplies, rough and treacherous roads, lack of specialists, lack of landline telephone facilities, limitations of mobile phone Short Message Service (SMS) technologies and expensive mobile phone charges, it is very difficult to retain these doctors in these municipalities. In an inter-sectoral meeting among four municipalities in Zamboanga del Norte and Zamboanga Sibugay provinces in August of 2006, it was discovered that most of the doctors in these areas felt professionally isolated and outdated due to the lack of continuing medical education, peer conferences, and specialty contacts. For example, in the municipality of Sergio Osmena in Zamboanga del Norte, the municipal health center receives between 200 to 350 patients per month with about 10 - 20% of the cases needing specialist referrals. Other municipalities in the region likewise reflect similar statistics. In Payao, the municipal health center receives from 300 to 400 patients per month while in Malangas, about 250 - 300 are seen each month. In both these centers, about 10% - 25% need specialist referrals. Moreover, even in Zamboanga City itself, barangay health units located in the outskirts approximately 42 kms from the tertiary centers are still staffed by only one general practitioner, who serves as a triage officer. Patients still need to travel to the nearest tertiary center if deemed necessary.

The arrival of information technology has ushered in a new way of maintaining contact between and among

different isolated regions with different medical sectors. These range from nurse monitoring of diabetes patients¹ to surgical guidance through video conferencing during an actual surgery.² Telemedicine is an emerging field of medicine that involves the use of medical information exchanged from one site to another through electronic communications to improve patients' health status.³ The term "telehealth", on the other hand, is often used to encompass a broader definition of remote health care that does not always involve clinical services.³ This is done by using existing computer-based technology either as a web-based program such as a Virtual Grand rounds session, a real-time consultation between a local doctor and his patient on one end with a specialist in the city on the other end, or by providing store-and-forward updates from journal articles or practice guidelines from different specialty societies.^{1,4,5} With proper use of this technology, the health care providers located in remote communities⁶ can thus maintain contact with much needed specialty consultants, have access to continuing medical education, and thus provide a higher and complete level of health care to their municipalities.

The Ateneo de Zamboanga University-School of Medicine (ADZU-SOM) established a Telehealth Office as a result of a pilot project between the University of Calgary Health Telematics Unit in early 2006 that brought a realization and much enthusiasm of the potential of applying telemedicine principles in this region. One of the programs that was developed is the Teleconsultation Program consisting of the use of the University's E-class System, a moodle-based educational system developed by the Ateneo Computer Center. The program is supported by sponsorships from private individuals for the laptop computers needed by the health providers in the communities. The Philippine Long Distance Telephone Company (PLDT)/SMART Communications likewise provided the school with a two-year free wireless broadband connection with WeRoam® that was later renewed and supported by the university. The Teleconsultation program was launched in April 2007 and data for its utilization analysis started in May 2007 (Phase 1). By April 2008, after a 10-month period of running the program solely using a web-based forum, it was apparent that utilization was highest only in the earlier months. Because the average time for a query to be addressed is 3 days, physicians expressed that they preferred real-time telemedicine consultations therefore the program strategy was revised to include an SMS-based system as well as a phone patch system that was being developed by the National Telehealth Center (NThC). However, due to technical difficulties in setting up the phone patch system, this strategy was not included in the revised Teleconsultation program.

While the idea of connectivity is promising, the question of actual usage and applicability of the project has been

questioned based on these initial results. Many researches have been done to develop telemedicine satisfaction and usefulness⁷⁻¹¹ evaluation tools; however, in some systematic reviews of these studies, it was noted that methodological deficiencies in terms of inadequate sample sizes, context of satisfaction ratings, and inappropriate sample designs hamper accurate and precise evaluation of satisfaction.^{8,10} In general, these telemedicine program evaluations show acceptability by patients with noted advantages in accessibility of specialist consultations, less travel time required, and reduced waiting times.^{7,8,12} On the other hand, some telemedicine users noted technical difficulties, inadequate person-to-person contact, and privacy issues which caused dissatisfaction with the system.^{7,8} This study therefore aims to determine the patient and provider satisfaction of the Teleconsultation program of the Ateneo de Zamboanga University - School of Medicine's Telehealth Office.

Methods

This is a descriptive cohort study of the utilization and satisfaction of patient and health care provider regarding the Teleconsultation program of the ADZU-SOM Telehealth Office. The program required the referring rural physician to log-in to the E-class forum on Teleconsultation. He or she then types in his or her query and may also upload pictures of the patient. The research assistant of the Telehealth Office logs in daily and alerts the specialist if there is a referral so that the specialist can reply. The specialist then logs-in to the Teleconsultation program and replies to the query. The municipal health officers were also given a directory of specialists who consented to participate in the Teleconsultation program. This signified their commitment to be on-call through SMS or cellphone calls as needed by the MHOs. Twenty-three municipal health officers from Zamboanga del Norte, Zamboanga del Sur, Zamboanga Sibugay and the Sulu Archipelago were invited to join the study. They were given a protocol abstract, a primer on the use of the Telehealth program, laptop computers with mobile internet connection, and data collection forms. Research assistants followed up collection of data monthly through e-mail or through telephone. The forms were collected and kept by the research assistants and summarized by the primary investigator. Patient satisfaction was obtained through questionnaires provided in the study for patients who needed specialty referrals wherein their MHOs obtained advice through the Telehealth program. Frequencies for the number of referrals requiring specialist consults, the number of consults made, their methods of consultation, and satisfaction regarding the Telehealth program is presented.

Ethical Considerations

The subjects in this study were recruited by purposive sampling and included municipal health officers assigned in different remote communities in Western Mindanao and the Sulu Archipelago. The patients who sought consultation and needed further consult with a specialist were likewise recruited on a convenience sampling method. They were informed by the MHOs that if they were to join the study, they will be offered an alternative method of seeking specialist consult obviating the possible need to travel to a tertiary center for consultation. The patients, if capable and above 18 years of age, were asked to sign a consent form for inclusion in the study. If the patient is a minor, his legal-aged nearest of kin was asked to sign the consent form. All consent forms indicated that the identity of the patient as well as the case details were revealed to the specialist but were not available for other purposes. Each MHO targeted by this study was also asked to sign a consent form by the investigator.

The responsibility for deciding to transfer to a higher center for more extensive care was shared among the patient, his relatives, the MHOs, and the specialist referred to. No financial assistance was given by the investigators to the patient nor solicited by the specialists or investigators from the patient for the travel expenses or for diagnostic procedures or medications. If the patient is financially challenged, they were given the option to be treated in the Zamboanga City Medical Center under the Department of Health. Upon consent for participation in the study, the specialists agreed to abide by the mechanics of the Teleconsultation program and were considered on-call for emergencies and non-emergency consultations from the health providers in the communities involved in the study.

The primary investigator is considered the primary author of the study. All materials obtained as a grant by the Telehealth Office of the ADZU-SOM were returned upon completion of the study. This included the laptop computers, WeRoam units, and mobile phones. Troubleshooting and repairs for these specific laptop computers, the WeRoam units and the mobile phones were shouldered by the ADZU Computer Center facilitated by the investigators.

Data obtained from this study is the property of the ADZU-SOM Telehealth Office. Publication of the completed research is at the discretion of the primary investigator.

Results

A. Subjects

There were 23 Municipal Health Officers from Zamboanga del Norte, Zamboanga del Sur, Zamboanga Sibugay, Basilan Province, Jolo, and Tawi-Tawi who were invited to join the study. Nine out of the 23 invited MHOs attended the Telehealth program orientation in Zamboanga

City while the rest received the study protocol and data forms either by mail or by delivery to their areas of practice. Out of the 9 who attended the orientation, only 4 were able to submit monthly reports from October 2008 to December 2009. Out of the 14 MHOs who received the study protocol and data forms, 4 were able to submit monthly reports from October 2008 to December 2009. Two MHOs from Jolo withdrew from the study due to inability to access the internet from their areas of practice and 1 MHO from Zamboanga del Sur withdrew due to inability to send data because he left his area of practice because of a threat to his life.

The areas of practice of the 8 MHOs included Zamboanga del Norte (Titay), Zamboanga del Sur (Kumalarang, Lakewood), and Zamboanga Sibugay (Talusán, Olutanga, Siay, Mutia and Alicia).

B. Utilization of the Teleconsultation Program

Over the course of 15 months from October 2008 to December 2009, a total of 1,715 consultations from 8 municipalities were thought to need specialist opinion, with an average of 15 consultations per municipality per month. Some municipalities had a low average from 2 per month to as high as 17 per month, although only one municipality had less than 200 referrals over the 15 months. However, out of the 15 consultations that needed specialist referral in a month, only an average of 7 received opinion from a specialist (total referrals to a specialist of 763). The most common method of getting advice is through SMS by the MHO to the specialist (42.8%). The next most common method (14.3%) is by calling the specialist directly. There were no consultations done using the e-consultation arm of the Telehealth program. 13.3% of consultations that needed specialist referrals per month ended up traveling to a tertiary center.

C. Satisfaction with the Teleconsultation Program

In general, the MHOs are satisfied with the present system of consultation which included mainly mobile phone technology (100%). They find the information that they get from the specialists to be helpful and are confident about their decision-making in subsequent cases (100%). All MHOs thought that the system made it easier for them to obtain information about their difficult cases. The confidence in their equipment that included their mobile phones and laptop computers was high and they thought that they were easy to use and that their privacy was kept. However, 25% of the MHOs (2 out of 8) thought that the system is costly to maintain.

Only 107 questionnaires were sent out to the patients by the MHOs and among them, 39 (36.44%) submitted their patient satisfaction survey forms. All patients indicated that in general, they were satisfied with the specialty consultation methods used by their MHOs. They all

believed that their MHOs used the information they got from specialists to care for their illness and as such, they also tended to be more compliant to their doctor's advice as well. Only 50% of the patients thought that this form of consultation was convenient while the other half thought that it was not very convenient. Sixteen percent thought that the system was time consuming. Thirty-two percent of the patients thought that this system made it more difficult for them to consult a specialist doctor. When asked if the patients themselves believe that they can use the basic mobile phone and laptop equipment to consult a specialist, 66.7% believed that they can.

Discussion

The use of information technology to promote health especially in rural areas has been in existence for many years and has been proven to be effective in other countries, even in developing countries.^{2,13-15} The enthusiasm towards gadget novelty and their potential applications often precede its actual utilization in the real-life setting,⁸ thus sometimes causing unnecessary spending on expensive equipment which turn out to be practically unused later on. In the Philippines, telemedicine is relatively new with focus mainly on IT applications for medical education rather than for clinical use. For this study's authors, the onsite experience of a telemedicine control center where full-time specialists command medical care through large video screens and other digital medical equipment elicited much enthusiasm for its potential use in rural Western Mindanao. However, this enthusiasm was tempered by the realities of limitations noted from this research. In this study, it was observed that the preferred method of using information technology is through mobile phones, either through SMS or through direct calls. This can be explained by feedback given by other MHOs where they noted that one of the biggest factors adversely affecting the use of an on-line system of consultation was the actual process that included having to open their computers, log on to the internet and navigate through the web to reach the forum on inquiries, notwithstanding having to patiently deal with the variable bandwidth available in different areas of rural Western Mindanao that also changes with weather conditions. This initial process of sending a referral took too much time whereas by using the mobile phone, the MHO can immediately type and send his query without waiting for his computer to boot up and for the internet to be connected. Moreover, the response time, which in the initial phase of the program showed that it took an average of 3 days for a specialist to respond by internet, is faster by either phone call or by SMS. In one of the brainstorming activities between the ADZU-SOM Telehealth Office and the NThC of the University of the Philippines - Manila to improve the speed of referrals, the use of a phone patch service that can be provided by the NThC is a promising option to include in

future Teleconsultation programs. In this system, the referring physician calls the NThC nurse and requests for connection with a specialist. The nurse then patches the call to the specialist who will then be linked to the referring physician. This method of referring offers a rapid and synchronous method of referring the case to a specialist. With a wider pool of specialists, the referring physician can be patched to any one who is available at that particular moment. Moreover, the referring physician has the option to pass on the call directly to the patient for a patient-specialist consultation. The costs will be lower for the referring physician and the patient because the responsibility for the bills payment will be shouldered by the project office where the Telehealth Office of the ADZU-SOM will provide mobile phone load and the costs for the establishment of the phone patch system is shouldered by the NThC. However, technical difficulties arose in the establishment of the system therefore this system was not used in the present study but may be promising in the future.

Another factor that may have influenced the preference for using mobile phones is the availability of electricity. In some areas such as Simunul Island of Tawi-Tawi, electricity is available for only 6 hours a day thus limiting use of electronic equipment that requires much power. Technical problems that involved hardware was also noted to be a barrier as some would require repairs of which would take time to bring to Zamboanga City, to repair and then to send back.

The study also showed that even with the easy access of specialist consultation with mobile phones, the MHOs in this study referred their cases only half of the time. Possible explanations for this phenomenon include limited time to refer through mobile phone because there are too many patients to attend to in the clinic, poor mobile phone signals in the area, hesitation of the attending physician, and unavailability of specialists in the specific field of expertise. The unavailability of specialists is largely because there are still few specialists practicing in the region of whom most often are difficult to reach because of their own busy schedules. A solution to this problem is the establishment of a larger network of specialists, including specialists from other regions to be involved with the program. It would also be interesting to determine factors that hinder rapid response to a query by a specialist or factors that hinder involvement of a specialist to telemedicine programs. A store-and-forward approach can also be adopted to provide rural physicians with updated guidelines developed by specialty societies in the management of common illnesses in the country. These can then be downloaded at the most convenient time for the physician and stored for future use.

The portability, ease of use, and less technically-reliant characteristics of the mobile phone makes this the platform of choice among the physicians. With the newer smart

phones coming out that offer wider capabilities such as internet surfing, gaming and data storage, researchers involved with telemedicine in the Philippines should concentrate on using this in developing programs for clinical applications rather than pushing for computer-based programs.

The satisfaction of both health provider and patients regarding this system was high, with much confidence placed on the system to deliver adequate advice on difficult cases. All health providers felt that they are confident to manage a similar case in the future after consulting with a specialist. This confidence should be taken cautiously since the legal aspect of such a form of consultation is still vague in this country.¹⁶ Issues on responsibility on decision-making, monetary reimbursement for consultation services by the specialists, and malpractice still have to be settled. While an e-commerce act has been established in the country as early as the year 2000,¹⁶ it does not provide specific details for its application in telemedicine.

It is noteworthy that half of the patient responders thought that the system was not convenient to use. This may be because they needed to wait for the specialist's response and then depend on their attending physician to relay the message before the management for their condition is set. Another perspective noted in this study is that there were some health providers who thought that this system is costly. With newer laptops and mobile phones and subscription plans at lower costs, this particular problem may be addressed.¹⁷

Conclusion

This study aimed to determine the health provider and patient satisfaction with the Teleconsultation program of the Ateneo de Zamboanga University - School of Medicine. Results showed that only half of the average number of cases that need to be referred to a specialist gets referred through the Teleconsultation Program. The most often used method of referring is by SMS or calling the specialist using personal mobile phones. In general, health providers and patients in this region of the Philippines are satisfied with this kind of system of referring, although its use is limited mainly by costs. Since the use of mobile phones is much preferred due to its availability and quick access to the specialists, the development of programs that use the strength of mobile phones in telemedicine applications such as better video sending with an interface that combines video and chat functions as well as options for DICOM-compatible images or standards for using digital images from a phone camera is recommended.

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