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ORIGINAL ARTICLE

Evaluation of Knowledge And Perception Of Malaysian Health Professionals About Telemedicine

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ABSTRACT

Background: Incorporation of Information Technology (IT) advancements in healthcare has been growing in the recent past. There is convincing evidence that developing countries can also benefit from telemedicine and other IT applications in healthcare. The Malaysian government, in mid-1996, launched the multimedia supercorridor (MSC) project. As a new medical technology in the country, it takes a huge effort to make professionals understand this new concept.

Objectives: To evaluate the readiness of healthcare professionals in the country in accepting and providing telemedicine services and to access levels of perception and opinion towards telemedicine, and to access knowledge factors in relation to telemedicine.

Materials and Methods: A cross sectional survey was carried out among various healthcare professionals using a proper sampling frame obtained from a list of health care providers in all state Department of Health in the country. The study questionnaire consists of 3 main parts; background and demographiy, perceptions and acceptance and knowledge level. The questionnaires were mailed to the respondents and the completed questionnaires were analyzed as per the study objectives.

Results: The total response rate in this study was 32.48% (369/1136). On average, the respondents were young and with 10 years of experience.The majority of the respondents mentioned that computers are important for them for internet use (84%) and using software packages (83%). Only 31% wish to accept the reduction of face-to-face communication with patients and other health professionals. Majority of respondents have used CD ROMs (82%), e-mail (84%) and modem (76%), while more than three quarters of the respondents have no experience with using smart cards, computer assisted learning (CAL), teleradiology, telesurgery, telenursing and telepharmacy, respectively.

Conclusion: The majority of respondents mentioned that their computers are important for them for internet use and using software packages. Nearly half of the respondents felt that computers are important for their profession. Mostrespondents have used CD ROMs and e-mail facilities. In general, the respondents have a low inclination towards working in rural areas for a telemedicine project.

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Introduction

Incorporation of Information Technology (IT) advancements in healthcare has gained wide acceptance in the last two decades. Developed countries have successfully incorporated IT advancements in their

healthcare system thus improving healthcare [1],[3]. However, only a limited application of IT advancements is seen in developing countries in their healthcare system. Recently, an international tele-epilepsy collaboration using videoconferencing in assisting an epilepsy surgery program was carried in Pakistan. The study found that the international tele-epilepsy collaboration was feasible and valuable to all participants [4] suggesting the application of telemedicine in developing countries. Similarly, a pilot study from Nepal has shown that a low-cost telemedicine link is technically feasible and could be of significant benefit in diagnosis, management and education in developing countries [5]. Telemedicine is expected to offer significant benefits to countries like India where the majority of the population lives in remote areas with no access to even the most basic healthcare[6]. Telemedicine is conceived of as an integrated system of healthcare delivery that employs telecommunications and computer technology as a substitute for face-to-face contact between provider and client [7].

The Malaysian government studied, reflected and borrowed elements of telemedicine practices from other parts of the world and incorporated them into its own practice. In mid-1996, the Malaysian Government launched the multimedia supercorridor (MSC) project [8]. During the International Conference of Information Technology (ICIT) and Networks 1999, the Health Ministry stressed on four Telemedicine projects working together to promote a fully developed health care system.. These projects are teleconsulting, continuing medical education, mass customized / personalised health information and education project, and lifetime health plan [9]. As a new medical technology in the country, it takes a lot more work to change the paradigm and its requires careful assessment of the real value of time and understanding of the professionals. It is hoped that this preliminary study will provide useful information concerning the readiness and potential users of telemedicine.

Objectives

The present study was conducted with the objectives of evaluating the readiness of healthcare professionals in the country in accepting and providing telemedicine services, to access levels of perception and opinion towards telemedicine, and to access knowledge factors in relation to telemedicine.

Materials and Methods

Study Design And Sampling

A cross sectional survey was carried out among medical doctors in general hospitals and private hospitals, and pharmacists in general hospitals, private hospitals and community pharmacies. Nurses or medical doctors in clinic settings were excluded since telemedicine is yet to become a common practice in these settings.

Sampling Technique

A proper sampling frame was obtained from a list of health care providers in all state Department of Health in the country. A total of 17 main hospitals and 62 district hospitals nationwide have been included in the study involving 673 medical doctors (425 in main hospitals and 248 in district hospitals) and 113 registered pharmacists (51 in main hospitals and 62 in district hospitals).

Study Tool

The questionnaire consists of 3 main parts; background and demography, perceptions and acceptance and knowledge levels.

Method Of Data Collection And Data Analysis

Questionnaires were mailed to the respondents and the completed questionnaires were analyzed as per the study objectives. As the aim of the study is to explore the three aspects mentioned, only descriptive statistics were used in the analysis.

Results

The response rate among professionals in hospitals is 37.40% (294/786). And out of 350 questionnaires that had been sent to

community pharmacies, 75 were received producing a lower response rate of 21.43%. As an overall result, the total response rate in this study was 32.48% (369/1136).

Demographic Details Of The Responders

Most of the respondents were males, Malays, medical doctors and doctors from government hospitals. On an average, the respondents were young and had 10 years of experience. The demographic details of the respondents are listed in [Table/Fig 1]

(Table/Fig 1) Respondent's demographic information

Item	No.	Percentage	Median
1. Age (years)			36.0
2. Gender			
Male	215	(58.3%)	
Female	154	(41.7%)	
3. Race			
Malay	154	(41.7%)	
Chinese	135	(36.6%)	
Indian	63	(17.1%)	
Others	17	(4.6%)	
4. Profession			
Medical doctor	237	(64.2%)	
Pharmacist	132	(35.8%)	
5. Practice Setting			
Government hospital	277	(75.1%)	
Private hospital	17	(4.6%)	
Community pharmacy	75	(20.3%)	
6. Years in service			10.0

Perception And Acceptance Of The Respondents Towards Telemedicine

The perception and acceptance of the respondents on the use of computers and telemedicine concept are mentioned in [Table/Fig 2]. A majority of the respondents mentioned that computers are important for them for internet use (84%) and using software packages (83%). Around 57% felt that computers are important for the profession and around 46% felt that computers are important in many areas of medicine and health care and in all aspects of health care. Slightly more than half said that few data storage and access system in their practice setting are computerized. When asked about their willingness to work in rural areas for telemedicine projects, around 39% of them said 'Yes only if given incentive' while another 34% said 'No, not even with incentive'. A very high number of respondents (n=343, 93%) did not feel reluctant to use computers and IT machines. Only 31% wished to accept the reduction of face-to-face communication with patients and other health professionals. Approximately 80% of them do like the idea of remote communication through telemedicine. When asked about their willingness to educate patients on telemedicine and its uses, approximately 84% said 'yes'. Another promising opinion is regarding teaching IT. Around 98% think healthcare professionals' schools and organizations should enhance education programs on computers, IT and telemedicine.

(Table/Fig 2) Respondent's perception and acceptance

Question	Percentage, % (No. of respondents)	
	Yes	No
1. What is the importance of computers for you?		
• Entertainment (games, music, etc)	48.8 (180)	51.2 (189)
• Internet	84.0 (310)	16.0 (59)
• Software packages (graphics, spreadsheets and word processing)	83.0 (307)	16.8 (62)
• Other	16.8 (62)	83.2 (307)
2. What is the importance of computers in your career?		
• Just common knowledge	4.6 (17)	
• May be useful	8.9 (33)	
• Important for the profession	56.6 (209)	
• Fundamental for a physician, pharmacist and nurse	26.0 (96)	
• Others	3.8 (14)	
3. What is the importance of computers in medicine and health care?		
• Almost none	0.3 (1)	
• In restricted areas	6.6 (24)	
• In many areas	46.2 (169)	
• In all aspects of health care	46.4 (170)	
• Others	0.5 (2)	
4. Are data storage and access systems at your practice setting computerized?		
• None	23.6 (86)	
• Few	53.8 (196)	
• Mostly computerized	19.0 (69)	
• Others	3.6 (13)	
5. Are you willing to work in rural areas for a telemedicine project?		
• Yes only if given incentive	38.8 (138)	
• Yes even with no incentive	14.6 (52)	
• No even with incentive	34.0 (121)	
• Others	12.6 (45)	
Question	PERCENTAGE, % (No of respondents)	
	YES	NO
6.		
a) Do you feel reluctant to use computers and IT machines?	6.0 (22)	93.0 (343)
b) Do you wish to accept the reduction of face-to-face communication with patients and other health professionals?	30.6 (113)	67.5 (249)
c) Do you like the idea of remote communication through telemedicine?	79.4 (293)	18.2 (67)
d) Are you willing to educate patients on telemedicine and its uses?	83.5 (308)	14.6 (54)
e) Do you think healthcare professionals schools and organizations should enhance education programs on computers, IT and telemedicine?	97.8 (361)	1.4 (5)

Knowledge Level And Experience Of Respondents On Technology Components Related To Telemedicine

The knowledge levels of respondents are shown in [Table/Fig 3]. A majority of respondents have used CD ROMs (82%), e-mail (84%) and modem (76%), while more

than three quarters of the respondents have no experience using smart cards, computer assisted learning (CAL), teleradiology, telesurgery, telenursing and telepharmacy, respectively. On the other hand, generally they know about all the components except CAL (82%), telenursing (66%), telesurgery (57%), teleradiology (55%), telepharmacy (55%) and smart cards (46%).

(Table/Fig 3) Knowledge level and experience of respondents on technology components related to telemedicine

Technology components	Percentage, % (No of respondents)			
	Know about it		Have used/ experience it	
	Yes	No	Yes	No
CD ROMs	90.8 (335)	8.1 (30)	81.8 (302)	15.4 (57)
E-mail	93.8 (346)	5.4 (20)	83.7 (309)	13.3 (49)
Modem	85.4 (315)	13.3 (49)	76.2 (281)	20.6 (76)
Video camera	75.9 (280)	22.2 (82)	35.0 (129)	59.3 (219)
Scanner	82.7 (305)	14.9 (55)	53.4 (197)	41.2 (152)
Smart cards	52.0 (192)	45.5 (168)	7.9 (29)	84.6 (312)
Computer assisted learning (CAL)	11.7 (43)	82.1 (303)	5.4 (20)	85.1 (314)
Library Computer Catalogue (LCC)	58.5 (216)	38.2 (141)	38.2 (141)	56.6 (209)
Teleradiology	42.0 (155)	55.0 (203)	6.2 (23)	85.7 (316)
Telesurgery	40.7 (150)	56.9 (210)	4.9 (18)	86.7 (320)
Telenursing	30.6 (113)	66.1 (244)	1.9 (7)	89.4 (330)
Telepharmacy	41.7 (154)	55.3 (204)	5.1 (19)	87.0 (321)

Discussion

This exploratory study conducted has shown us the level of knowledge and perception of telemedicine among healthcare professionals and has provide us with a general idea about the readiness of healthcare professionals in participating in telemedicine services in Malaysia. Telemedicine can be a useful method in expanding healthcare in rural areas which have limited healthcare facilities. It is predicted that Telemedicine may in fact have a more profound impact on developing countries than on developed ones [10]. However, to make it more useful healthcare professionals should have a positive attitude towards this new technology and should be willing to be computer friendly. Our study found that healthcare professionals to have a positive opinion on the telemedicine concept. However,the majority of them do not wish to accept the reduction of face-to-face communication with patients and other health professionals. It might be because often direct communication with patients is considered vital in physician-patient communication.

The success of the implementation of telemedicine services depends very much upon the acceptance of the users, the health professionals. A study from the United States (US) evaluated the effect of changes in the health-care sector. The survey results indicated that nearly one third of the professionals believed that technology in health-care was having a large effect on their work –[11]. Another study from the rural communities of US reported that the introduction of telemedicine into rural communities is associated with increases in the local communities' perception of local health care quality and hence is it possible that telemedicine may result in a decrease in the desire and need for local patients to travel outside of their community for health care services [12]. However, one study from the United Kingdom reported that the mental health staff did not have adequate knowledge of, or access to videoconferencing [13]. Authors from Canada evaluated the mental health services for children and youth and recommended promotion activities as being important for the successful implementation of telemental health services for children and young people [14]. In our study, there was a positive opinion among healthcare professionals regarding the telemedicine concept and the use of computers. However, constant awareness programs may further be essential to improve the applications of telemedicine services in the healthcare settings of Malaysia.

The medianage of the respondents in our study is 36 years, which is considered young and with median years of service of 10 years. This group of respondents has provided non-convincing findings for their willingness to work in rural areas for a telemedicine project. In general, this age group of professionals is more well versed with the latest IT facilities including computers, telecommunications etc. It may be because very often healthcare professionals feel that the clinical examination of the patients is necessary prior to performing any procedure on the patients. Moreover, there are also a lot of ethical and legal issues related with applications of telemedicine in resource limited settings. Authors from India question

'who will be held responsible if telemedicine-assisted surgery fails due to failure in connectivity? Is it the surgeon, the satellite provider or the software/hardware engineer?' Thus, in order to implement telemedicine projects in developing countries, one should have clear cut legal and ethical bindings.Information systems like the internet, telephone facilities etc should be reliable for a better implementation of telemedicine in developing countries.

In spite of the various limitations, the telemedicine concept can be useful for Malaysia and successful implementation depends upon improving the awareness among healthcare professionals regarding the applications of telemedicine in their practice. Nearly all the respondents in our study felt that the schools and organizations related to healthcare should enhance education programs on computers, IT and telemedicine. This approach can definitely help in creating awareness among future healthcare professionals.

Conclusion

This study has provided some information on the level of understanding and knowledge of telemedicine among healthcare providers . A majority of the respondents mentioned that their computers were important to them for internet use and for using software packages. Nearly half of the respondents felt that computers are important for their profession.A majority of respondents have used CD ROMs and e-mail facilities. In general, the respondents have a low inclination towards working in rural areas for a telemedicine project. From the result, the study hopes to suggest ways to access the potential benefits of computer technology in terms of improving access to information, enhancing communication, increasing efficiency of healthcare delivery and higher quality of medical care.

References

[1] Parker OD, Demiris G, Wittenberg-Lyles E, Porock D. The use of videophones for patient and family participation in hospice interdisciplinary team meetings: a promising approach. Eur J Cancer Care (Engl). 2009 Oct 14. [Epub ahead of print]
[2] Aziz SR, Ziccardi VB. Telemedicine using smartphones for oral and maxillofacial surgery consultation, communication, and treatment planning. J Oral Maxillofac Surg. 2009; 67 (11):2505-9.
[3] Scholl J, Lambrinos L, Lindgren A. Rural telemedicine networks using store-and-forward Voice-over-IP. Stud Health Technol Inform. 2009; 150:448-52.
[4] Ahmed SN, Mann C, Siddiqui F, Sheerani M, Syed NA, Snyder T, Enam SA, Boling W. Experiences from an international tele-epilepsy collaboration. Can J Neurol Sci. 2009; 36(5):582-6.
[5] Graham LE, Zimmerman M, Vassallo DJ, Patterson V, Swinfen P, Swinfen R, Wootton R. Telemedicine--the way ahead for medicine in the developing world.. Trop Doct. 2003; 33(1):36-8.
[6] Sharma LK, Rajput M. Telemedicine: socio-ethical considerations in the Indian milieu. Med Leg J. 2009; 77(Pt 2):61-5
[7] Bashhur RL. On the Definition and Evaluation of Telemedicine. Telemedicine Journal. 1995; 1(1): 19-30.
[8] Mohan J, Yaacob RRR. The Malaysian Telehealth Flagship Application: a national approach to health data protection and utilisation and consumer rights. International Journal of Medical Informatics 2004; 73: 217-27.
[9] Proceedings of International Conference on Information Technology (ICIT) 1999, Sept 8 – 10, 1999, Kuala Lumpur, Malaysia.
[10] Edworthy SM. Telemedicine in developing countries. BMJ. 2001; 323(7312):524-5
[11] Hicks LL, Boles KE, Hudson ST, Koenig S, Madsen R, Kling B, Tracy J, Mitchell J, Webb W. An evaluation of satisfaction with telemedicine among health-care professionals. J Telemed Telecare. 2000; 6(4):209-15
[12] Nesbitt TS, Marcin JP, Daschbach MM, Cole SL. Perceptions of local health care quality in 7 rural communities with telemedicine. J Rural Health. 2005 Winter;21(1):79-85
[13] Austen S, McGrath M. Attitudes to the use of vido conferencing in general and specialist psychiatric services. J Telemed Telecare. 2006;12(3):146-50
[14] Cloutier P, Cappelli M, Glennie JE, Keresztes C. Mental health services for children and youth: a survey of physicians' knowledge, attitudes and use of telehealth services. J Telemed Telecare. 2008;14(2):98-101