

Medical Students' Knowledge and Perceptions of e-Health: Results of a Study in Sri Lanka

Sisira Edirippulige^a, Rohana B. Marasinghe^b, Anthony C. Smith^a, Yoshikazu Fujisawa^c,
Walisundara B. Herath^b, M. T. M. Jiffry^b, Richard Wootton^a

^a Centre for Online Health, University of Queensland, Australia

^b Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka

^c Niigata University of Health and Welfare, Japan

Abstract

The present study investigates the knowledge, perceptions and attitudes of medical students in Sri Lanka in regard to e-health. We also examined the barriers which impede them to develop knowledge and skills in e-health within their medical curriculum. A questionnaire focusing on the knowledge, attitudes and expectations of medical students towards e-health was distributed to all final year students (n=136) at the Faculty of Medical Sciences, Sri Jayewardenepura University, Sri Lanka. Response rate was 74%. 43% of respondents stated that they were familiar with the term e-health. 51% rated their knowledge of e-health applications as minimal. 88% admitted that they had no e-health education or training of any kind. Over 80% of all respondents thought that e-health had an important role to play in the current and future health sector, particularly in developing countries. Our survey revealed that respondents had very poor access to computers and Internet use was rare. 77% of respondents admitted that they were not provided with systematic knowledge and skills in e-health through their medical curriculum and identified the absence of formal education in e-health as a serious shortcoming.

Keywords:

medical education, e-health, curriculum development, developing countries

Introduction

The healthcare industry in general is under growing pressure to provide services more efficiently and economically [1]. As far as developing countries are concerned, problems and issues associated with the health services are even more daunting [2]. Extreme poverty has prevented governments in developing countries from funding health adequately resulting poor state of health in the populations. Poor health infrastructure, inadequate facilities and the shortage of healthcare professionals are characteristic features of the health sector in developing countries. Rural and remote communities – where the majority of the population live in developing countries - are particularly deprived of health services. Addressing health issues in

developing countries has become a global concern [3]. However, there is no quick remedy to health problems in developing countries as the improvement of health infrastructure and the increase of the number of health professionals require long-term investments and policy implementations [4].

In this context, e-health has been identified as one alternative to provide improved services and specialist care in developing countries [5]. The potential of e-health applications, i.e. the delivery of health services across a distance by using information and communication technologies (ICT) is being recognised for its potential, especially for the delivery of health services to rural and remote areas [6]. International organizations such as the United Nations (UN) and the World Health Organization (WHO) have acknowledged e-health as a potential alternative to address acute health needs in developing countries [7-8].

Among many other factors, the acceptance of e-health by health professionals is extremely important if this new modality of healthcare delivery is to become an integral part of mainstream healthcare. Knowledge, acceptance and enthusiasm to utilise e-health as an alternative way of service delivery by healthcare professionals, particularly by doctors would help facilitate the integration of e-health. Needless to say, developing countries are one of the most likely beneficiaries of e-health. Thus, knowledge and skills in e-health and keenness to use this tool by local healthcare professionals would undoubtedly help address at least some of the existing problems.

There is a growing body of literature showing that e-health has a role to play in contemporary healthcare [9-10]. Also literature is evident that e-health is useful for developing countries [11]. However, there is not many studies done to investigate the level of knowledge among health professionals [12]. A few studies show the level of IT knowledge in medical students [13].

Sri Lanka is a developing country according to number of indicators. Like other developing countries, health sector in Sri Lanka has been challenged by various problems. Total expenditure on health as a percentage of GDP in 2002 was 3.7% which is significantly lower than that is in

industrial countries. Overall access to health facilities for people in Sri Lanka is low. For example the number of hospital beds per 1000 population constitutes 2.9. The number physicians per 10,000 population is 4.11 [14].

Rural population in Sri Lanka constitutes 77% of the total population [15]. The most complete hospital facilities and highest concentration of physicians are in the urban areas, while many rural and remote areas suffer severe scarcity of health services. Thus the territorial disparity in health services is a characteristic feature in the island (Table 1). Emergency transport of patients especially in the countryside is still at a rudimentary level.

Table 1 - Number of medical specialists in urban and rural hospitals in Sri Lanka¹

Speciality	Urban	Rural	Total
Cardiologists	18	0	18
Neurologists	9	0	9
Psychiatrists	15	0	15
Pathologists	23	9	32
Dermatologists	10	1	11
Radiologists	29	6	35
Microbiologists	16	0	16
Occupational therapists	46	1	47

¹ Source: Sri Lanka Government Health Web Portal, 2005, (<http://www.health.gov.lk/>)

Aims

The objective of this present study was to evaluate the knowledge, attitudes and perceptions of medical students towards e-health since their preparedness is a key to the success in implementing e-health in developing countries.

Methods

We designed and distributed a survey to assess the knowledge and attitudes of medical students towards the broad subject of e-health. The survey was distributed to all final year medical students (136) studying at the Faculty of Medicine, Sri Jaywardenepura University (SJU), Sri Lanka. Questions were divided into the following sections: demographic details, knowledge in e-health, relevance to future practice, the use of computers and the Internet and access to e-health education.

Results

Demographics

A total of 100 (74%) students completed the survey. 54% of respondents were female. The majority of respondents (about 91%) were between the age of 26-30 years and the remainder were between 23-26 years of age.

Knowledge of e-health

Nearly half of all respondents (43%) admitted that they were familiar with the term e-health. However, 51% of respondents described their knowledge and skills related to e-health as minimal while 22% were unsure. 86% of respondents had had no exposure to e-health education and/or training. 71% of respondents said they had never read any literature on e-health.

Relevance of e-health

Questions were asked to examine the perceptions of the students about e-health. About 86% of all respondents admitted that e-health will have an important role to play in the current and future health sector. Only 2% disagreed with that statement while 11% were not sure. Again 86% of respondents agreed with the fact that e-health will be useful in their future practice. Only a very small number admitted that e-health will have no use in their future practice. 78% of respondents admitted that e-health applications will improve their services. Majority of respondents (77%) believed that e-health would have particular relevance to developing countries and 85% agreed that e-health should be encouraged.

Use of computers and the internet

Several questions were asked to establish the knowledge and skills of the participants in computing and the level of the Internet use. The results of the survey showed that the availability of computers and the Internet for students was low. They admitted that the access to computers and the Internet was limited both at home and at the university. Only a very small number (3%) of students had frequent access to computers and the Internet. The majority of students (65%) used the Internet very rarely. Nonetheless a large number of students admitted that they were comfortable using computers and the Internet. Also 67% admitted that they had formal computer education and training. The majority of students expressed the desire to have better and more frequent access to computers and the Internet.

Access to e-health education

41% of respondents admitted that they had received no satisfactory knowledge of e-health through their medical program while 36% were not sure. While 79% of respondents suggested that e-health should be included in the medical curriculum and 56% thought that e-health must be offered as an elective. About 85% of survey participants suggested that e-health course must include a practical component to provide hands-on skills. More than half of respondents (64%) expressed their willingness to study e-health at post-graduate level.

Participants of the survey also identified the lack of appropriate educational programs, financial constraints, lack of

Table 2 - Information and Communication technology distribution

Countries	Main telephone lines per 100 persons	Residential main lines per 100 households	Monthly subscription as % of income per capita	Personal computers per 100 persons	Internet users per 10,000 persons	Internet hosts per 10,000 persons
Low income	2.9	11.4	14.1	0.6	62.2	1.0
Lower middle income	13.6	35.8	2.9	2.4	264.9	4.3
Upper middle income	22.7	59.8	2.0	8.2	992.6	78.7
High income	59.7	108.8	0.7	37.3	3992.9	1484.2
World	17.1	54.9	5.7	7.7	820.8	232.6
Africa	2.6	9.9	12.7	1.0	84.9	3.4
Americas	35.1	80.6	3.1	26.6	2164.3	1332.9
Asia	10.7	41.8	5.5	2.2	433.9	28.7
Europe	40.5	80.0	1.1	17.9	1804.5	191.5
Oceania	40.0	98.3	3.7	39.9	2771.6	885.2

Source: International Telecommunication Union, World Telecom Indicators 2002

sufficient access to technology and traditional methods of medical education as major barrier to develop systematic knowledge and skills in e-health.

Discussion

There are no quick solutions to the complex problems in the health sector in developing countries. Among others, e-health has been identified as one possible solution to address some of these problems. Under right circumstances new technologies can improve the quality of care and efficiency of services. Governments as well as private sector around the world have become aware of the potential of new technology. But the enthusiasm of policy makers and investments in infrastructure only cannot enable e-health to enhance health services. The expansion of knowledge and skills in e-health at grass-roots level (among health professionals) and their acceptance of these techniques are imperative factors for e-health to become sustainable.

Our survey revealed that although the majority of students were familiar with the term e-health their knowledge and skill to practice this modality was extremely limited. Indeed, the limited access to computers and the Internet is a serious barrier in developing countries. Unlike in industrialised countries, computers are still a luxury in the developing world. Presumably this barrier has limited the advantages they may gain from new technologies. This limitation also represents a significant factor preventing them from acquiring necessary knowledge and skills in e-health. The so called 'digital divide' is still a formidable barrier to be overcome [16].

Despite the fact that students have limited access to computers and the Internet, the majority of them are computer literate. In fact, there is a growing interest in computers and the Internet in the developing world [12]. The students

found that one of the main barriers for them to develop appropriate knowledge and skills in e-health was the absence of formalised e-health educational components in the medical curriculum. There is a need to provide knowledge about the fundamentals of e-health, basic concepts and various applications with particular emphasis on low-cost e-health modalities. Such education must also include a practical component to provide medical students with necessary hands-on skills. This preparation would enable students to choose relevant applications in their own practice suitable for their own circumstances.

Conclusions

Health systems in developing countries can be a potential beneficiary of e-health applications. Not only local governments, but also the international organisations such as the UN and the WHO have identified the potential of ICT to address the health needs of developing countries. Efforts have been made to promote e-health in developing countries by investing funds, initiating projects and introducing technology and improving infrastructure.

However, in this effort, e-health education has been the least attended area. The knowledge, acceptance and enthusiasm of local health professionals, particularly doctors are vital if e-health is to be a significant component of mainstream healthcare. Cultivation of a positive attitude towards e-health requires systematic education. Students must be provided with a formalised e-health education within their medical and health curriculum to establish knowledge in basic concepts, terminology, various e-health applications, successes and failures in current practice. Such education must also include a practical component to provide hands-on skills.

Undoubtedly the impact of digital divide is still a serious problem for developing countries. Concerted efforts must

be made to enhance the access to technology in these countries. The potential of low-cost e-health applications in developing countries is still untapped. In order to use low-cost e-health modalities to their full capacity one must have an appropriate knowledge in e-health and understanding of local needs. Formalised e-health education embedded into medical and health curriculum is needed to enhance the knowledge and skills of local health professionals.

Acknowledgments

We thank the University of Queensland (New Staff Start-Up Research Fund) for funding this research. We also thank the medical students of Sri Jayewardenepura University for their participation in the study.

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Address for correspondence

Dr Sisira Edirippulige
Centre for Online Health
University of Queensland
Level 3 Foundation Building
Royal Children's Hospital
Herston Road HERSTON Q 4029
(Fax: +61 7 3346 4705)
Email: s.edirippulige@uq.edu.au