
eHEALTH READINESS OF HEALTHCARE INSTITUTIONS AND USERS IN BOTSWANA

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Abstract

eHealth systems include applications of information and communication technologies to improve healthcare services delivery, support, and education. Many countries around the world, including Botswana, are in the process or have already adopted the use of such technology in their healthcare sectors. Often this is done without first gauging the readiness of the setting: healthcare workers meant to use the technology, or the facilities in which such technology will be used. eHealth Readiness is the 'preparedness of healthcare workers, communities, or institutions for the anticipated change brought about by programmes related to information and communications technology'. This study measured eHealth readiness of healthcare institutions in Botswana, and identified personal attributes of users that may influence their readiness to apply eHealth. A self-administered questionnaire with closed-ended questions was used to collect data from 87 healthcare workers at two hospitals in Botswana. The questionnaire contained 19 questions covering 3 domains (aptitudinal readiness, attitudinal readiness, and infrastructural readiness). The responses were rated on a 5-point Likert-type scale ranging from strongly disagree to strongly agree. The questionnaires were then coded and data analysed using Statistical Package for Social Sciences (SPSS) version 21.0. Results highlighted that participating institutions showed a different degree of eHealth infrastructural readiness. Participants in the study showed a high level of eHealth attitudinal readiness but a low level of eHealth awareness.

Keywords: eHealth readiness; health infrastructure; public health informatics; eHealth implementation; Botswana.

Introduction

The application of information and communication technologies (ICT) in the healthcare sector, i.e., eHealth, is increasingly being adopted by many governments across the world. eHealth is considered an innovative way to make health services more effective and efficient.¹ The government of Botswana has seen the need to embrace the use of eHealth. Of concern is that implementation of eHealth is often cited as being costly.² Any government intending to invest in eHealth needs to ensure that its implementation is successful; unsuccessful implementation can result in great losses in terms of time, effort, and money.³

Successful implementation of eHealth initiatives is difficult and high failure rates are reported.⁴ Most failures may have nothing to do with the technology, but instead with factors such as a lack of readiness. Adoption of eHealth initiatives often proceeds without first gauging eHealth readiness of the setting and users. eHealth readiness has been defined as the preparedness of healthcare institutions, communities, or individuals for the anticipated change brought about by programmes related to use of ICT.⁵ An eHealth readiness assessment carried out prior to the implementation of any eHealth initiative enhances success by allowing implementers to understand where challenges exist and, where necessary, mitigate these challenges.

A number of tools have been applied to measuring e-readiness of individuals, communities, and organisations. Légaré *et al.* identified and summarised six telehealth readiness tools, only one of which was considered sufficiently generic to use with different types of telehealth project and user, but all were from the developed world.⁶ Khoja *et al.* designed and validated readiness tools specifically for the developing world, and created two questionnaires; one for managers, and a second for healthcare providers. Questions were grouped into four categories, and for healthcare managers addressed core-readiness, societal readiness, policy readiness, and technological readiness, whilst for healthcare providers they addressed core-readiness,

societal readiness, policy readiness, and learning readiness.⁵ A recent approach to assessing eHealth readiness is to look more closely at the readiness of individuals. The Australian Government has recently used a tool that assesses not only infrastructural readiness (the setting, including technology and connectivity), but also aptitudinal readiness (depth of skills and capability to use eHealth solutions), and attitudinal readiness (willingness to use current and future e-health solutions) of users.⁷ This three dimensional approach is seen as providing a more robust understanding of a state of readiness and the likely barriers and enablers.

This study measured eHealth readiness of healthcare institutions in Botswana, and identified personal attributes that may influence readiness of potential users.

Methods

An eHealth readiness assessment tool was developed using the principles of Khoja *et al.*, and the approach of the Australian Government.^{5,7} The self-administered tool was developed in both Setswana and English, and contained 19 questions with a Likert-type scale for responses ranging from strongly disagree to strongly agree. Questions covered 3 domains: infrastructural readiness, aptitudinal readiness, and attitudinal readiness. Clarity of the questions was assessed by pre-testing the tool on five employees working at Facility A (3 nurses, 1 doctor and 1 dental therapist).

The revised tool (Appendix A) was used to collect data from a convenience sample of participants in two hospitals in Botswana (Facility A and Facility B). All questions were mandatory. All employees of the two hospitals were given a memo inviting them to participate in the study. The questionnaire was then distributed only to those healthcare workers on duty during the day of the survey. The target population for the study comprised of nurses, doctors, pharmacists, radiologists, laboratory technicians, and dental therapists, as well as non-clinical staff such as archivists, hospital managers, and administration staff. Responses were coded and data analysed using Statistical Package for Social Sciences (SPSS) version 21.0.

Results and Discussion

A total of 87 healthcare workers participated in the study (50 Facility A; 37 Facility B). Only 50% or less

of the participants agreed that they understood what eHealth was (Figure 1), highlighting a need for training and sensitizing of healthcare workers at these facilities about eHealth.

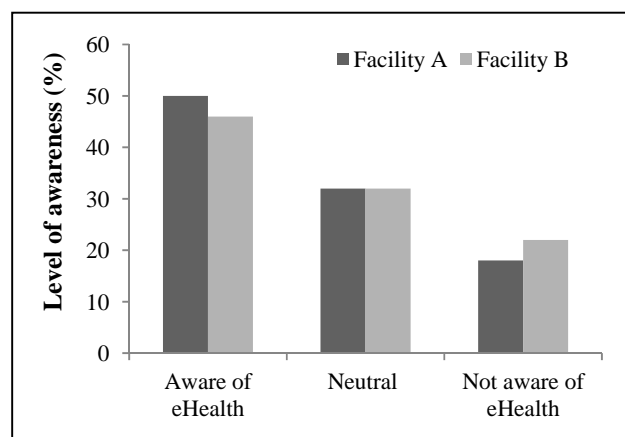


Figure 1. eHealth awareness of healthcare workers.

Xie Bo has clearly demonstrated that training of potential users before eHealth technologies are implemented can have a positive impact on their perception of eHealth.⁸ Of concern is that this low level of eHealth awareness exists despite a government that has fully embraced eHealth.⁹ An explanation is that there is still a great shortage of sufficiently qualified and knowledgeable individuals in sub-Saharan Africa to train other healthcare workers.¹⁰ It will take considerable time to adequately and appropriately ‘train’ healthcare workers in a country.¹¹ Given the fundamental role of eHealth users, the government should ensure that all users (healthcare workers and the public) are trained about eHealth before embarking on large scale implementation of eHealth initiatives.

Ironically, a large majority of participants agreed that they were knowledgeable in the use of computers and the Internet (Figure 2).

Further, only a small percentage of participants indicated they would not be comfortable with using eHealth (Figure 3).

Collectively, these findings suggest ICT awareness (knowledge in the use of computers and Internet) creates comfort among users of eHealth. Qureshi *et al.* noted that poor ICT skills among health workers are a cause of reluctance to embrace use of eHealth initiatives.¹²

Healthcare workers at both facilities displayed a

high attitudinal readiness by appreciating the necessity of eHealth implementation and also believing that it could assist them in their work (Figure 4).

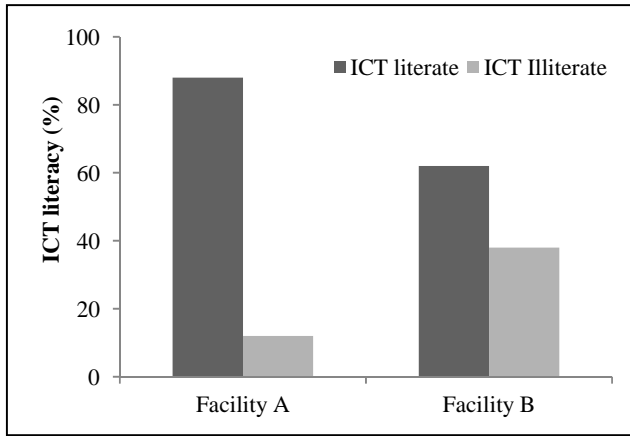


Figure 2. Level of ICT literacy among healthcare workers.

swana were built at different times, and their ICT infrastructure cannot therefore be expected to be the same.

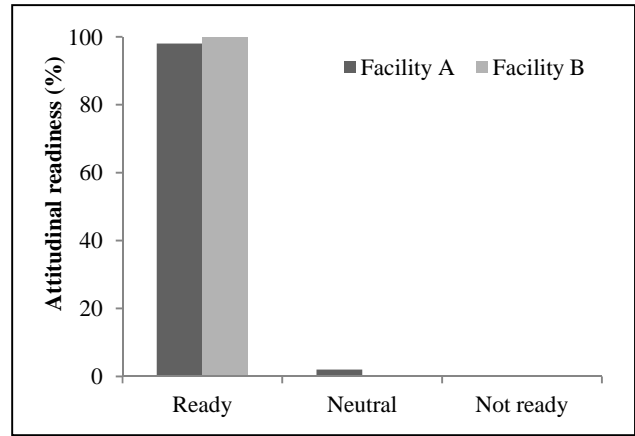


Figure 4. eHealth attitudinal readiness of healthcare workers.

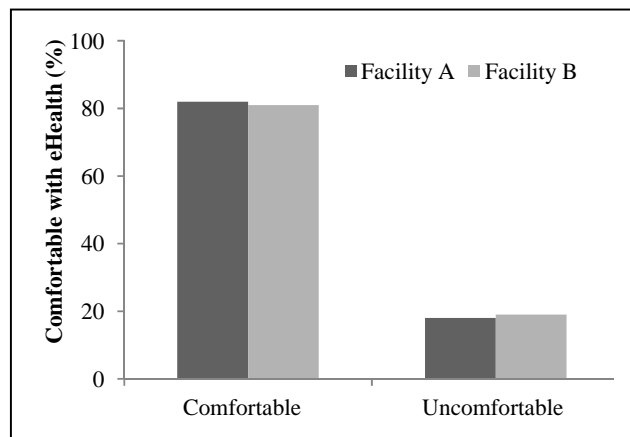


Figure 3. Comfort of eHealth use among health workers

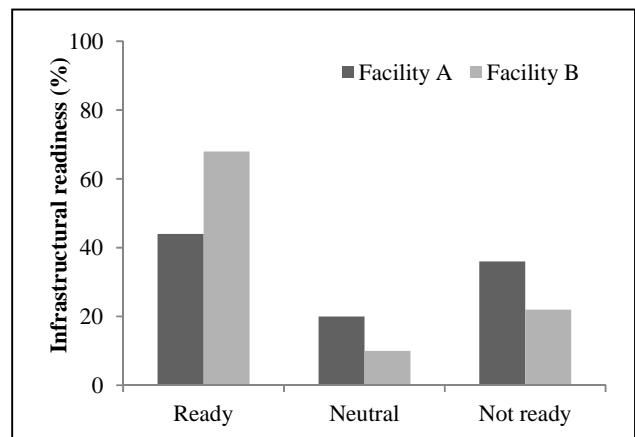


Figure 5. Perception of eHealth infrastructural readiness among healthcare workers

This positive finding is important as attitudinal readiness is a critical component for successful implementation of any new initiative in a work place (employees will resist a new initiative unless they believe it is necessary and not a burden).

Most participants in Facility B agreed that their institution's infrastructure was ready for adoption of eHealth. In contrast less than 50% of participants from Facility A agreed that their infrastructure was ready (Figure 5).

An explanation may lie in that hospitals in Bot-

This study has limitations. Responses to all subsequent questions were not differentiated based on level of knowledge of eHealth expressed by participants, which may bias results. For example, someone unknowledgeable about eHealth may subsequently judge infrastructural readiness of a facility to be high, but how reliable is their insight?

Future e-readiness assessments should make this differentiation. In addition, the tool requires validation prior to further use. Finally, the results are from only 2 facilities, and therefore are unlikely to be representative of readiness across Botswana.

Conclusion

Organisational and individual readiness have been identified as critical precursors to the successful adoption of an innovation.¹³ This preliminary study has highlighted the need for decision-makers in Botswana to pay closer attention to eHealth capacity building, as well as infrastructural development, in order to raise eHealth readiness. Performance of a comprehensive country-wide eHealth readiness assessment (using a validated tool) would better inform the government, and improve the success rate of eHealth implementations in Botswana.

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Conflict of Interest: The author declares no conflict of interest.

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APPENDIX A

eHealth readiness of healthcare institutions in Botswana

(QUESTIONNAIRE)

FACILITY ID: _____

UNIT/WARD: _____

DEMOGRAPHIC DATA

AGE (tick): 18-24/25-34/35-44/ 44-55/over 55

SEX: _____

NATIONALITY: _____

OCCUPATION: _____

HIGHEST

EDUCATION

QUALIFICATION: _____

LENGTH OF SERVICE: _____

Instructions: Please complete the following questions to reflect your opinions as accurately as possible. Your information will be kept strictly confidential. Do not write your name anywhere on this questionnaire. For each question given below, circle the number that best describes your opinion on the issue. Use the key given below:

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

#	Question	1	2	3	4	5
1.	I understand what eHealth is					
2.	I understand what electronic medical records are					
3.	I am knowledgeable in the use of computers and internet					
4.	I would be very comfortable in operating an IT based health care system if it was to be introduced at work					
5.	I would need additional training to operate an IT based health care system if it was to be introduced at work					
6.	New personnel would need to be hired to operate an IT based health care system if it was to be introduced at work					
7.	The new personnel hired to operate the IT based health care system must be registered with the Botswana Health Professions Council					
8.	IT based health care systems are necessary					
9.	IT based health care systems can assist me in my work					
10.	My work environment (infrastructure, internet connectivity e.t.c)would be able to support the use of an IT based health care system					

11. Please explain the response you gave in question 7 above _____

12. Please explain the response you gave in question 9 above

13. Please explain the response you gave in question 10 above.

14. Please name any IT based health care systems that you are currently using at work. Explain what you are using such a system for.

15. Are you comfortable with operating the IT based health care systems that you mentioned in question 14 above? **Please tick ✓ one box that corresponds to your answer**

YES

NO

16. The IT based health care systems mentioned in question 14 meet the demands of my work. **Please tick ✓ one box that corresponds to your answer**

YES

NO

17. If the answer for question 16 is no, please explain the functionalities/improvements that you feel need to be added to the IT based health care systems so that they could meet the demands of your work.

18. How often do you use the internet? **Please tick ✓ one response below**

Daily / Weekly / Monthly / Occasionally / Never

19. If you do, what do you usually do on the internet? (*e.g., email, use reference materials such as encyclopaedias and dictionaries, read news, social networking, games, entertainment etc.*)
