ATTITUDES TOWARD INFORMATION TECHNOLOGY AMONG OPERATING THEATRE NURSES IN SRI LANKA

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Abstract

Incorporating the use of information and communication technologies (ICT) into everyday professional practice requires nurses to overcome resistance to change and to become willing users and creative operators of IT. Managing the change process effectively while implementing eHealth (e.g., Hospital Information Systems) within the operating theatre environment can facilitate the efficient delivery of quality patient care. **Aim:** To describe the uses of and attitudes toward current IT by operating theatre nurses at The National Hospital of Sri Lanka (NHSL). **Methods:** The research used a descriptive design and survey method. The study population was theatre nurses working in 16 theatres. A convenience sample of 112 nurses selected from the 16 theatres was used. Nurses with a service period over 20 years were excluded. Data were gathered with a self-administered questionnaire. **Results:** The response rate was 97 of 112 (87%). The study found that nurses were highly confident in using computers, touch screens, the Internet and email. Almost 80% of theatre nurses used computer technology for their work and personal matters. However only 60% of the nurses had personal email addresses. Furthermore, 79% of nurses believed that computers would reduce paper work. **Conclusion:** Most operating theatre nurses possess a positive attitude toward advances that use IT applications. This may be due to the growing presence and accessibility of IT in their work environment, which has added value in their day to day practice in the hospital. To facilitate ongoing growth in use of IT in Sri Lanka, continuing education opportunities for operating theatre and other nurses should be pursued.

Keywords: nurses; ehealth; information and communication technology; education; operating theatre nursing; Sri Lanka

Crossref

Introduction

Over the last decade, information technology (IT) has experienced an extraordinary rate of development. IT has brought significant change in the perceptions, attitudes and ways of thinking of its users,[1,2] made many aspects of life,[2,3] and necessitated organisations to adopt IT to remain competitive.[4] However, use of IT in healthcare settings has also had negative impacts on care delivery systems. For example, while IT overcomes the problem of distance between healthcare provider and patient, it also means that there is no hands on interaction between doctor/nurse and patient.[5] IT may extend quality of life and socioeconomic status as well.[6] Adoption of new IT systems requires skilled staff and positive attitudes to the new technology.[7] Wilbright et al[8] found that nurses lacked sufficient computer literacy, work -related computer skills and proficiency with basic Windows' functions.

Sri Lanka had no national IT-based healthcare system until 2011, although some healthcare institutions had previously adopted digital solutions of their own accord.[9] The Ministry of Health of Sri Lanka established the Health Information Unit of the Management Development and Planning Unit (MDPU) as the focal point for eHealth activities.[10] There are currently no large-scale eHealth projects implemented in Sri Lanka, but the MDPU is poised to implement some IT-based information system initiatives in healthcare settings within the next few years.[11] However, there has been no nursing research into IT in healthcare, and a gap in knowledge exists around, for example, the use and attitudes of operating theatre nurses in Sri Lanka toward computer technology. This study fills this knowledge gap, and also explores the interest of nurses in participating in IT based activities in nursing care settings for future benefits.

Methods

This study used a descriptive research design and a survey to assess the use of IT by operating theatre nurses, and describe their attitudes toward present and future use of IT. It was carried out with operating theatre nurses of the National Hospital of Sri Lanka (NHSL). This hospital is the largest hospital and final referral centre in the country and has about 3,500 beds. It is the only national level hospital, and supports most specialties; for example, there are 31 specialty clinics (surgical, medical, cardiothoracic, ear-nose and throat), but no paediatric clinics. It has 16 operating theatres, with 358 nurses working in the operating theatres. These nurses were graded according to their work experience: Grade 11-B (0-5 years of work experience), Grade 11-A (6-10 years' work experience), Grade 1(11–15 years of work experience), and Super Grade (15–20 years of work experience).

Those with between 0 and 20 years of experience could volunteer to participate in the study. Nurses with over 20 years of work experience were excluded as they were nearing retirement and were not expected to be working with the new IT-based systems). Nurses who were on medical / long-term leave during the data collection period were also excluded. Both Sinhalese and Tamil nurses were included. A convenience sample of 112 operating theatre nurses (seven nurses from each of the 16 theatres) were approached to participate without regard for duty or shift hours.

A self-administered questionnaire was designed based on the reviewed literature and prior research.[4] . The survey had 9 closed-ended questions and one open-ended question. One question had 7-parts, and used a five point Likert scale to ask about nurses' attitudes toward, access to, and use of IT Another question asked about the meaning of IT; the Oxford Dictionary definition was used as the reference definition – "the study or use of electronic equipment, especially computers, for storing, accessing, analysing and sending information".[12] Because both Sinhalese and Tamil nurses were fluent in English, the questionnaire was provided only in English.

The questionnaire was reviewed by two research supervisors at the International Institute of Health Sciences Sri Lanka for face and content validity, and pre-tested by 10 government sector nurses enrolled in the Open University of Malaysia Bachelor of Nursing degree programme.

Although the questionnaire was self-administered, the researcher was present in person during data collection allowing immediate response to any questions in accordance with a pre-prepared protocol that provided explanation for each question. The survey data were collected from 20 March to 15 April 2014. The researcher handed the questionnaire to each of 112 nurses (7 from each theatre), personally meeting them after duty hours to minimise disturbance to the nurse's work and patient care. The procedure was explained to them and their consent was sought and received.

This study was approved by the Institutional Review Board of the National Hospital of Sri Lanka Informed and written consent was obtained from all participants.

Descriptive statistics were used to summarise data and to compute the frequency, percentage, mean, mode and median values of different variables in the data using Microsoft Excel. Categorical variables were described using frequencies and proportions.

Results

The response rate was 87% (97 of 112) as 15 respondents did not complete all questions. Forty-nine nurses (51%) were grade 11-B, 40 (41%) were grade 11-A, 3 (3%) were grade 1 and 5 (5%) were in the super grade category.

Confidence in use of information technology
The confidence of theatre nurses in using a variety of IT hardware and software applications ranged from Very Confident to Not Confident. Some respondents selected Don't Know or No Experience, did not respond. (Table 1)

Attitude of nurses to IT use
In response to a need for training in the use of different IT applications tools and software, responses ranged from 34 nurses wanting more training in use of the Internet to 39 wanting more training in the use of email. (Figure 1)

Most of nurses either 'agreed' or 'strongly agreed' that it is essential for a nurse to learn about using IT applications. When responses were displayed by years of employment, there was little difference across groups. (Figure 2)

Most respondents also agreed that IT applications made their jobs easier, although more 'agreed' than 'strongly agreed'. (Table 2) Also, nurses with 10 or fewer years of work experience were more in agreement than nurses with 11 to 20 years.

The responses of nurses on learning about and using IT applications in the workplace were quite positive. The ques-

Table 1. Confidence of respondents in the use of ICT.

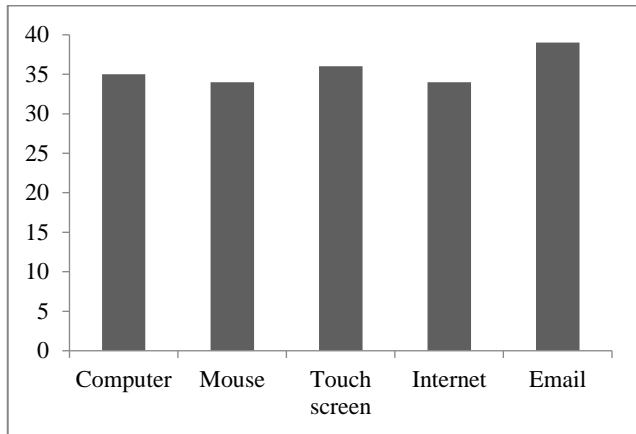| Confidence Items	Very confident	Confident	A little confident	Not confident	Don't know	Have no experience with IT	No response
Items	14	48	24	3	1	5	2
Computer	20	43	23	3	1	4	3
Mouse	20	41	21	5	1	6	3
Touch screen	17	46	20	7	1	3	3
Internet	17	41	17	11	1	7	3
Email	17	41	17	11	1	7	3

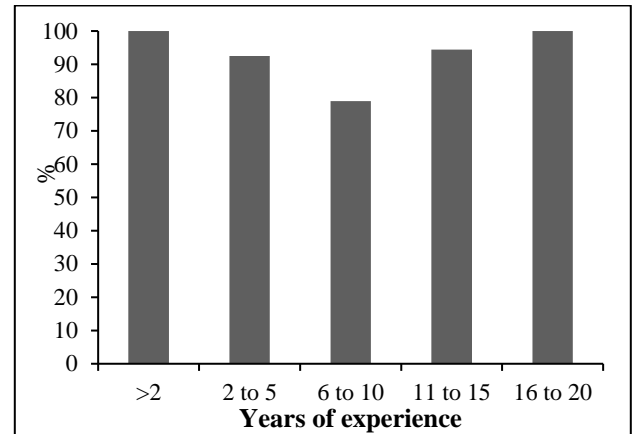**Figure 1.** Number of nurses wanting training in IT applications.

Figure 2. Percentage of respondents agreeing that learning about IT is essential.

Table 2. Opinions on the statement "The use of IT in my workplace has made my job easier".

Work Experience in years	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	No response
0-2	3	1	0	1	3	0
3-5	7	25	3	1	0	5
6-10	2	13	0	0	0	4
11-15	4	13	1	0	0	0
16-20	5	4	0	0	0	1

Table 3. Responses about the use and benefits of IT applications.

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No response
Avoid using computers whenever possible	7	23	4	37	14	12
Learning about computers is essential	46	43	1	1	0	6
Use of IT reduces error	19	48	8	8	2	12
Use of IT reduces duplication	10	55	6	9	1	16
Use of IT makes life easier	22	55	5	2	3	10
Use of IT improves information access	25	58	2	1	0	11
Computers will reduce paper- work	25	51	4	6	0	11

tion about using computers whenever possible was reverse coded. There were also generally positive responses to various actual or potential benefits of IT applications. (Table 3) Between 6 and 16 respondents chose not to answer the items.

Access to Information Technology
Seventy-six respondents indicated they used a computer for work related activities or personal use or both. (Table 4) Nurses with between 3 and 5 years of work experience gave the highest positive response to this question. Thirteen respondents between 2 and 15 years of experience did not use computers and three respondents said they had 'no idea'.

On the question of email use, 59 (61%) respondents had email access and personal email addresses. (Table 5) Those

nurses with 3 to 5 years of employment were most likely to have email addresses. About half of the nurses with less than 2 and between 6 and 15 years of employment had email. Almost all nurses with 16 to 20 years of experience had email.

Table 4. Use of computer for work or personal activities.

Work Experience (y)	Yes	No	No idea	No response
0-2	7	0	1	0
3-5	32	5	2	0
6-10	12	5	0	2
11-15	14	3	1	0
16-20	11	0	0	0

Table 5. Nurses who have personal e-mail accounts categorised according to work experience.

Work Experience	Yes
>2	20
3-5	26
6-10	7
11-15	1
16-20	5

The questionnaire included one item that asked for respondents' opinions on the statement "Information technology will improve multi-disciplinary communication." Only 20 nurses agreed with the statement and years of experience did not make a difference. The view that IT will benefit the care environment where the clinical working practice relies on a collaborative, multidisciplinary interaction was agreed by 5 nurses.

Discussion

The study evaluated the use of, access to, and attitudes of operating theatre nurses toward IT in the National Hospital of Sri Lanka. A survey examined the nurses' preparedness for the sort of IT-based work environments found in the developed world. Some countries, for example Australia with its rapidly developing digital healthcare services, have recognised this as a high priority.[4,13]

The results of the study demonstrated important factors for the use of information technology by operating theatre nurses in Sri Lanka. The survey was long, but the high response rate (87%) suggests this topic is one which is very important to nurses. The results of this study can be used as reference material for governmental policy makers or researchers to initiate future IT base activities.

The study found a confident attitude among most staff toward basic IT applications. Given that previous studies have shown increased computer experience relates to positive attitudes,[13,14] it may be that familiarity of operating theatre nurses with touch screen monitors and other technology facilitated this confident response. Experience and confidence in other tools and applications were not limited for the most part to more senior personnel. Low use, experience and confidence in IT were seen most in senior nurses and nurses with less than 2 years' experience. Greater use and confidence were seen among nurses with greater than 2 years' experience.

An interesting finding was that the nurses were reluctant to discuss multi-disciplinary communication that could be improved based on IT in the workplace. This contrasts with a study in Finland that noted nurses believe that computerised information improves multi-disciplinary communication.[15]

The Government of Sri Lanka continues with health system improvements, including the implementation of eHealth innovations, which cannot be achieved without the readiness of healthcare providers. Findings from this study could form the basis for developing the structure and composition of assessment tools to determine the readiness of nurses and other healthcare providers to participate in ehealth innovations in the workplace. Further research to understand the views of senior nurses regarding IT may also be needed. This group is responsible for the efficiency and effectiveness of care delivery, and for decisions about the operating theatre functions, and their attitudes toward and knowledge about ehealth will be critical for success. As the largest cohort of healthcare professionals, nurses represent an influential group. Raising their awareness, ability, and readiness to integrate ehealth innovations would be valuable.

Limitations
A convenience sample was used in the study reducing generalisability of the results and opening the possibility for sampling error because respondents may have been more interested in IT than those who chose not to participate. There may have been discussions about the questionnaire among participants, but this was not controlled for. The study was in only one institution which could limit its applicability to other institutions.

Recommendations
Professional, on-going training programmes are necessary to support nurses in understanding and using IT to its maximum effect. Schools of nursing could consider integrating content about informatics and digital applications into their curricula and providing continuing professional development programmes. The government is encouraged to continue advancing eHealth programmes and IT applications in Sri Lanka.

Conclusion

This study of attitudes toward access to and use of IT has shown that operating theatre nurses have a basic understanding and positive attitude toward IT in the workplace. Operating theatre nurses at the National Hospital of Sri Lanka are prepared to embrace IT advancements in their work environment. Consequently, the IT and larger eHealth upgrades that have been proposed by the government of Sri Lanka could be initiated in the National Hospital's operating theatre section before broader implementation.

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Conflict of interest. The authors declare no conflicts of interest.

References

1. Nunn S, Quinet KJER. Evaluating the effects of information technology on problem-oriented-policing: If it doesn't fit, must we quit? *Eval Rev* 2002;26:81-108. DOI: 10.1177/0193841X02026001004

2. Doupi P, Hämäläinen P, Ruotsalainen P, et al. eHealth strategy and implementation activities in Finland. Report in the framework of the eHealth ERA project. eHealth ERA, ed.(STAKES), NRaDCfWaH. 2007.

3. Bernstein ML, McCreless T, Cote MJ. Five constants of information technology adoption in healthcare. *Hosp Top* 2010;85(1):17-25. DOI: 10.3200/HTPS.85.1.17-26

4. Hegney D, Eley R, Buikstra E, et al. Australian nurses access and attitudes to information technology-a national survey. *Stud Health Technol Inform* 2006;122:688-692. PMID: 17102351.

5. Gibson K, O'Donnell S, Coulson H, et al. Mental health professionals' perspectives of telemental health with remote and rural First Nations communities. *J Telemed Telecare* 2011;17(5):263-267. DOI: 10.1258/jtt.2011.101011.

6. Lee C-C, Lin S-P, Yang S-L, Chang K-Y. Evaluating the influence of perceived organizational learning capability on user acceptance of information technology among operating room nurse staff. *Acta Anaesthesiol Taiwan* 2013;51(1):22-27. DOI: 10.1016/j.aat.2013.03.013

7. Lemke HU, Vannier MW. The operating room and the need for an IT infrastructure and standards. *Int J Comput Assist Radiol Surg* 2006;1(3):117-121. DOI 10.1007/s11548-006-0051-7.

8. Wilbright WA, Haun DE, Romano T, et al. Computer use in an urban university hospital: technology ahead of literacy. *Comput Inform Nurs* 2006;24(1):37-43. DOI: 10.1097/00024665-200601000-00010.

9. Weerakkody V, Dwivedi YK, Kurunananda AJITfD. Implementing e-government in Sri Lanka: Lessons from the UK. *Inf Technol Dev* 2009;15(3):171-192. DOI: 10.1002/itdj.20122

10. Sylva P, Abeysinghe B, James C, et al. A review of eHealth policies that underpin global health care digitization. *Sri Lanka J Bio-Med Inform* 2012;2(4):118-129. DOI: 0.4038/sljbmi.v2i4.2447

11. Marasinghe RB, Edirippulige S, Smith AC, et al. A snapshot of e-health activity in Sri Lanka. *J Telemed Telecare* 2007;13(3 Suppl):53-56. DOI: 10.1258/135763307783247266

12. Hornblower S, Spawforth A, Eidinow E. *The Oxford classical dictionary*: Oxford University Press, **2012**.

13. Mehdi K, Majdabadi HA, Mozhgan K, et al. Nurses' perception about the effect of hospital information system in Iran. *Int Inf Inst (Tokyo).* 2012;15(4):1823-1832.

14. Huryk LA. Factors influencing nurses' attitudes towards healthcare information technology. *J Nurs Manag* 2010;18(5):606-612. DOI: 10.1111/j.1365-2834.2010.01084.x

15. Koivunen M. Acceptance and use of information technology among nurses in psychiatric hospitals. 2009.