TABS VS BOOKS: A STUDY ON ACCEPTANCE OF NEW TECHNOLOGY AMONG STUDENT NURSES IN SRI LANKA

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ABSTRACT

One of the most important skills which healthcare professionals in Sri Lanka lack is the use of Information Communication Technology. Hence, grasping current technology has been quite challenging. One way of overcoming this issue would be to familiarise oneself with basic devices such as smartphones, tablets and computers. However, as the country is trying to keep up with the pace of the rest of the world, it is necessary to assess Sri Lankan healthcare professionals' acceptance of new technology prior to implementing it. A descriptive cross-sectional, quantitative study was carried out using convenience sampling technique. First-year Bachelor of Nursing students, who were working in hospitals at the time, were selected as the sample. Computer-Assisted Personal Interviewing technique was used to collect data from 135 working nurses. Data was analysed using Microsoft Excel and Statistical Package for the Social Sciences (SPSS) version 22. Of the participants, the highest percentage was under 30 years old (73.3%, n=99) and only 9% (n=8) were male nurses. Besides, 85.1% had the experience of using a smartphone for more than 2 years. There was no significant difference between age and years of smartphone use, according to the Pearson Chi-square test (p=0.147). Most of the participants had used a tablet for less than 2 years (average 68.1%). There was a significant difference between age and the preferred method for future (tablets/books) (p=0.045). However, 94.9% believed that books alone would not help them grow professionally. Finally, 88.8% of them confirmed that they would be satisfied with using a tablet instead of books. In conclusion, a majority of the nurses were satisfied with the use of tablets rather than books and believed that this would help them further in their professional growth.

Keywords: *Tablets, Information Communication Technology, Satisfaction, Acceptance, New Technology, Education.*

INTRODUCTION

Background

Nursing students require a wide variety of health information for their educational and clinical needs to be met. Many healthcare professionals, due to time constraints, prefer to obtain reliable but easy-to-use and convenient information (Dee & Blazek, 1993; Lathey & Hodge, 2001). Printed materials such as journals and nursing textbooks, and information from colleagues or professional superiors are a few of the most preferred sources for nursing information (Cogdill, 2003; Rasch & Cogdill, 1999). However, from the mid-1990s, the usage of electronic equipment for information retrieval was found to be increasing in popularity around the world (Verhey, 1999). The literature also suggests that even though the usage of electronic devices among nurses is increasing, they have not been optimally used. This was found to be mainly due to lack of time to search for information (Curtis, Weller, & Hurd, 1997), lack of access to a device (Grajek et al., 1997) or lack of Information Communication Technology (ICT) skills, making them reluctant to use the devices (Bachman & Panzarine, 1998). ICT skills are becoming an integral part of quality healthcare delivery by nurses and it is important that student nurses incorporate ICT into their education, in order to develop the skillset and gain confidence (McCaughan, Thompson, Cullum, Sheldon, & Thompson, 2002). Furthermore, for working nurses who are enrolled in higher education, e-learning or hybrid learning would be the best method of learning due to factors such as heavy workload, geographical distance, and cost (Nicoll, MacRury, van Woerden, & Smyth, 2018).

Sri Lanka is a developing country and compared to international standards, the healthcare system is still developing. Even though the world is moving towards e-health, Sri Lanka is still at a stage where its healthcare workers are not efficiently using electronic devices (Rannan-Eliya & Sikurajapathy, 2008) or by extension, ICT. In order to overcome this issue, it is important to implement a programme where the student nurses use electronic devices for their studies. This would in turn enhance their ICT skills (Button, Harrington & Belan, 2014; Ilomaki & Rantanen, 2007) and boost their confidence in using information technology for their own benefit and that of their patients. However, before implementing the programme, it would be important to assess the nursing students' attitudes towards the use of new technology and the level of satisfaction among the nurses who are currently using new technology. This would ensure a successful implementation of the programme (Nicoll, MacRury, van Woerden, & Smyth, 2018).

LITERATURE REVIEW

Kruse and Beane (2018), in their systematic review, noted that Health Information Technology (HIT), which is used to describe a variety of technologies used to store, share and analyse health information, has played a role in the healthcare industry since the 1960s. After reviewing 37 studies, Kruse and Beane (2018) came to the conclusion that there are positive effects of HIT, as identified in most of the reviewed studies which discussed effectiveness of the outcomes. They further stated that the practitioners who have knowledge and skills in HIT are sustainable in the future. In another systematic review, done by Kruse, Stein, Thomas, and Kaur (2018) on Electronic Health Records (EHRs), the authors have noted that HIT is positively changing the healthcare industry. This study was done to identify the barriers of implementing EHR and resistance to change was identified as one of the main barriers (Kruse et al., 2018). It is evident from these studies that ICT is one of the skills that nurses should possess in order to adapt to the ever-changing world.

Gunawardana (2007) noted that the modern world is transforming from an industrial society into an information society. The speed of this advancement, mainly in developed countries,

is demanding urgent action be taken by the developing countries. He further noted that it is necessary that people make themselves familiar with computers and that using them in schools might help; however, putting this into practice would not be as easy as it seems (Gunawardana, 2007). Similarly, in a study done in the United Kingdom, Somekh (2008) mentioned that teachers have tried to adopt ICT into teaching for a few decades, and further noted that there are many barriers to ICT adoption. These mainly include teachers' and students' knowledge and beliefs (Somekh, 2008). Gunawardana (2007) further mentioned that ICT is not properly integrated into the education system in Sri Lanka and because of that, the knowledge gained during schooling is not adequate. Furthermore, it was noted that Sri Lanka is far behind developed countries and its government is still in the infancy stage when ICT is considered (Gunawardana, 2007). Recommendations to improve ICT use include increasing internet usage in the country and increasing computer usage by at least five fold (Gunawardana, 2007).

Button, Harrington, and Belan (2014) conducted a literature review on e-learning and ICT in nursing education, identifying that e-learning is one of the most significant changes in nursing education. They also noted that the successful implementation of e-learning depends on ICT literacy among both educators and students (Button et al., 2014). Their study concludes by stating that the ICT and nursing informatics knowledge that the students gain would equip the nursing students with life-long learning skills (Button et al., 2014). In addition to that, Ilomäki and Rantanen (2007), in their longitudinal study, have tested the relationship between usage of a laptop and the development of high-level computer skills and competence in ICT. They gave a laptop to 18 lower-secondary school students to be used both at school and at home for 3 years (Ilomäki & Rantanen, 2007). Then they assessed the students' ICT competence and found that the students who did ICT-related tasks outside the school had achieved competence (Ilomäki & Rantanen, 2007). Tablets are more or less similar to other computers (Mock, 2004). Tablets can even be considered one of the best tools to be used in the education system due to their advantages, including ease of use, touch screen, functionality, interaction, and other factors.

With all the evidence, it could be concluded that incorporating ICT and new technology into education would gradually enhance students' skills. However, the success of such implementation would depend on the users' attitudes and willingness to use the technology. Gungoren, Bektas, Ozturk, and Horzum (2014) noted that it is necessary that the new technology be accepted by the users for a technology-incorporated programme to be successful. There are few models that discuss the acceptance of technology, such as the Technology Acceptance Model (TAM). TAM was developed by Davis (1993), who suggested that for a project which includes new technology to be successful, it is really important that the involved parties first accept the technology. Davis (1993) further explained that acceptance is affected by attitudes and that the attitudes are dependent mainly on perceived usefulness of the new technology. Hence it could be argued that satisfaction with and acceptance of new technology needs to be assessed before implementing a programme which incorporates them.

Objectives

The objectives in this study were to:

(1) Assess the satisfaction of nurses enrolled in a Bachelor's Degree in Nursing (BN) with the use of tablets for the course instead of books.
(2) Assess the level of acceptance among the nurses towards incorporating new technology into their learning methods.

RESEARCH METHOD

Research Design

A descriptive cross-sectional quantitative study design was used, in order to address the objectives of this study.

Population

First-year nursing students following the Bachelor of Nursing (BN) course at International Institute of Health Sciences (IIHS), Sri Lanka, were chosen as the population for this study. These BN nurses were considered to be the appropriate population for the study as they are learning in a hybrid learning environment. They are also required to use a tablet for their studies, starting from their first semester. The second semester was considered to be the best time period to assess their acceptance of this new technology as they had been using the technology for some time but still can be considered new to that technology. The total number of BN first-year students was 200.

Inclusion and Exclusion Criteria

(1) All the nursing students following a BN programme who were in the second semester of their first year were included.
(2) Only the nursing students currently working as nurses were included.
(3) Only the BN students who gave their consent were included.

Study Sample

The sample size was calculated using Raosoft. The required sample size for the total population, for 95% confidence level, was 132. However, 135 nurses were approached using a convenience sampling technique to select the required sample for the study.

Data Collection

Computer-Assisted Personal Interviewing (CAPI) was done using tablets. The survey included 11 questions on demography and on the acceptance of tablets instead of books.

Data Analysis

Data was initially arranged and analysed using Microsoft Excel. Descriptive charts were created using percentages after initial data analysis. Further analysis and cross tabulation were done using IBM SPSS version 22. Chi-square test was performed to identify the associations.

FINDINGS AND DISCUSSION

Findings

The total number of responses was 135, out of which male participant percentage was only 7% (n=9) (Figure 1). In terms of age, the highest percentage of the participants (73%, n=99) was below 30 years of age, whereas only a few (6%, n=8) were above 40 years of age (Figure 2).

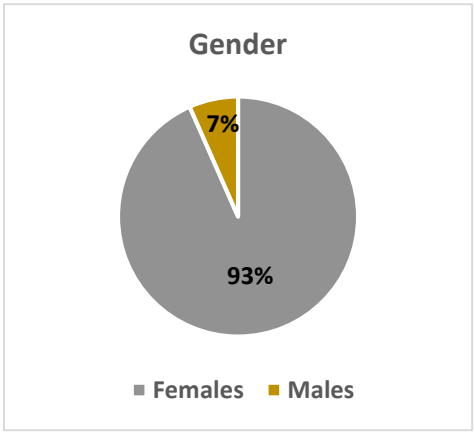

Figure 1: Gender Distribution

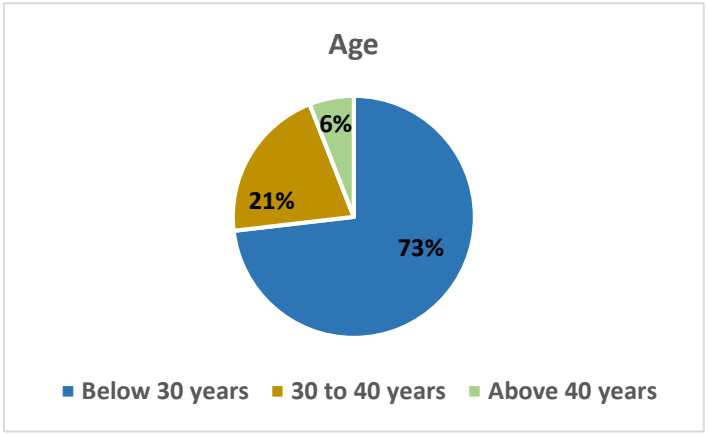

Figure 2: Age Distribution

A majority of the participants (85.1%, n=115) have used a smartphone for over 2 years; however, there is no statistically significant difference (p=0.147) between the years of usage of smartphones and age (Figure 3, Table 1, Table 2). The usage of tablets, however, was very limited among the participants. A majority (68.1%) of the participants had used a tablet for less than 2 years, out of which 72.2% had never used a tablet before the start of the BN degree programme (Figure 4).

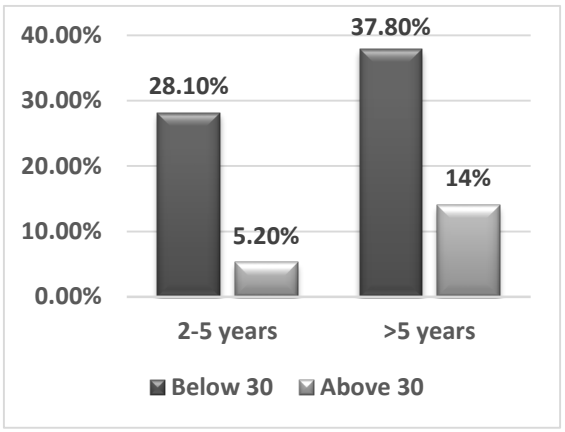

Figure 3: Usage of Smartphones by Years

Table 1: Cross tabulation of Age

		*Years		Total
		2-5 years	>5 years	
Age	Below 30	38	51	89
	Above 30	7	19	26
Total		45	70	115

* Years of smartphone usage

Table 2: Chi-Square Test – Smartphone usage by age

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.102[a]	1	.147		
Continuity Correction[b]	1.492	1	.222		
Likelihood Ratio	2.181	1	.140		
Fisher's Exact Test				.175	.110
N of Valid Cases	115				

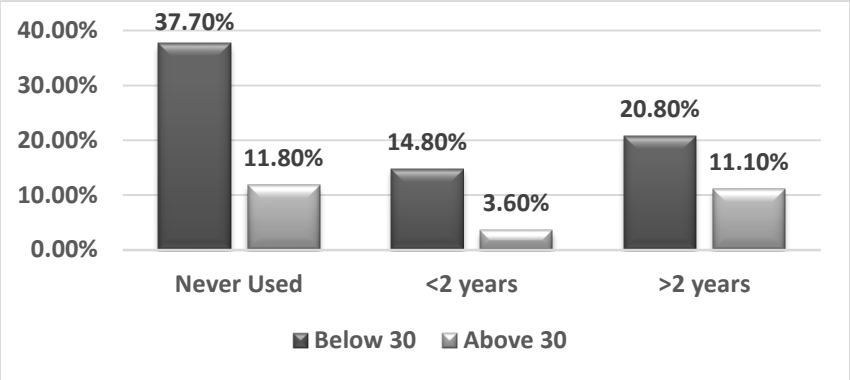

Figure 4: Usage of Tablets by Years

With regard to the preferred method for future studies, a majority stated that they would prefer using tablets over books. There is a statistically significant difference (p=0.045) between age and preference, where the participants below 30 years of age mostly prefer to use a tablet for their studies compared to participants over 30 years (Figure 5, Table 3, Table 4).

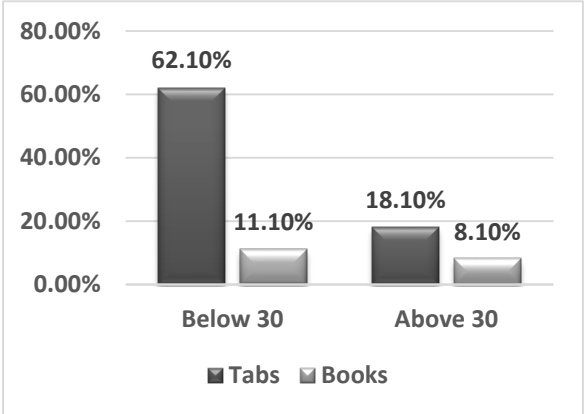

Figure 5: Preferred Method

Table 3: Cross tabulation of Age

		* Method		Total
		Books	Tabs	
Age	Below 30	15	84	99
	Above 30	11	25	36
Total		26	109	135

* Preferred method for future

Table 4: Chi-Square Test – Preferred method for future studies by Age

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.028[a]	1	.045		
Continuity Correction[b]	3.099	1	.078		
Likelihood Ratio	3.758	1	.053		
Fisher's Exact Test				.052	.042
N of Valid Cases	135				

Nearly all participants stated that using a tablet would contribute towards their professional growth. It was also evident that the majority (89.3%, n=120) were satisfied with the usage of tablets and none of the participants reported that they were dissatisfied (Figure 6).

Overall findings show that the majority of the participants, who were first-year Bachelor of Nursing (88.7%, n=119) students, would choose to use a tablet for their studies over learning guides and textbooks (Figure 7).

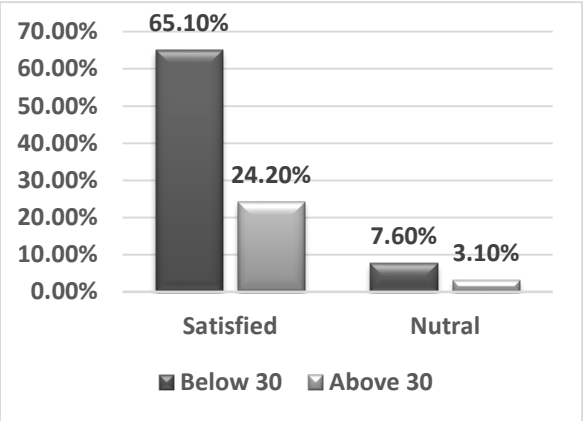

Figure 6: Tablets over Books for Professional Growth

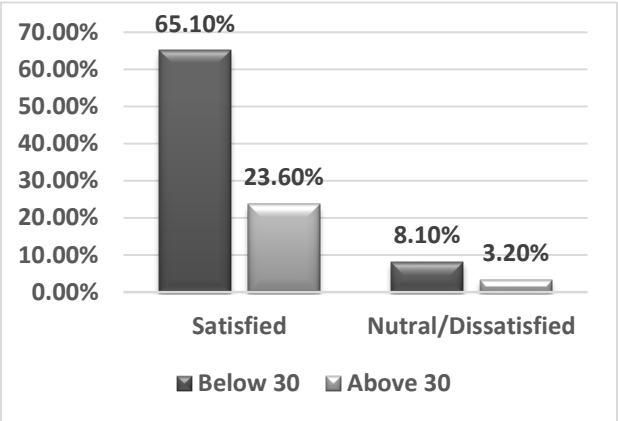

Figure 7: Satisfaction of Using a Tablet instead of Books

Discussion

Gender plays a major role in acceptance of new technology, where males are grasping new technology more readily than females (Goswami & Dutta, 2016). The difference in distribution of the two genders in this study was significant, where the percentage of female population was 93%. However, this reflects the country's nursing statistics, as male nurses account for only 5% of the nurses in Sri Lanka (Government Medical Officers Association [GMOA], 2010). When considering the ages of nurses, the majority in the hospitals would be about to retire. However, the majority who would do their further education would be the younger nurses. This could be the reason why the distribution of age of the nurses was as noted in Figure 2.

Mobile phone usage in Sri Lanka has been rapidly increasing over the past decade and smartphones are found to be the electronic device used by more than half of the internet users whereas usage of tablets is around 2% (Department of Census and Statistics Sri Lanka, 2017). Similarly, a majority of the participants in the study have used a smartphone for more than 2 years whereas about half of the total participants have never used a tablet before.

According to government statistics, computer/IT literacy is high among people below 30 years of age (Department of Census and Statistics Sri Lanka, 2017). The percentages reduce further when they are not competent in English to about half of what it would be if they were English literate. This is because the latter would be able to surf English-only websites (Gunawardana, 2007). IT literacy would determine the user's ability to handle new technology, such as e-learning/e-books and this would determine their preferences. That could be why more nursing students below 30 years of age prefer to use e-books compared to nurses above 30 years of age ($p=0.045$).

In all the developed countries, technology is integrated into healthcare. Similarly, developing countries are trying to adopt the latest technology such as HIT and EHRs into their healthcare systems (Kruse, Stein, Thomas, & Kaur, 2018). This would require nurses to use at least some of the new technologies. Similarly, it could be identified from the results that even though some of the nurses are not willing to engage in e-learning, they think that doing so would help them grow professionally.

Finally, in order to implement e-learning, it is necessary that the nursing students accept the tablet and feel satisfied in using it. Similarly, it has been suggested by Gungoren, Bektas, Ozturk, and Horzum (2014) that acceptance of tablets in students' education is very important for the sustainability of e-learning programmes. Furthermore, this would enhance the acceptability of new technology in their practice. The responses of participants in this study showed that a majority are satisfied with using tablets over books for their studies. This could mean that they are aware of the future benefits of using a smart device and e-learning. The small percentage who responded neutrally towards using tablets could be because some believe that it is not necessary for their development or because of technical failures that they may have faced while using the tablet.

Limitations

This study, however, has its limitations as it was conducted only among nursing students who are taking the BN degree at IIHS. There are three more degree awarding institutes/universities in Sri Lanka and generalising the results of this study into them would, hence, be difficult. Furthermore, there could be other factors affecting their responses, such as the students' assuming the freely given tablet might be collected back, despite being informed to the contrary. Furthermore, all the nursing students approached for this study provided consent and submitted their responses, which might have been because they assumed non-participation could create an issue for them.

CONCLUSION

Most of the participants were females under 30 years old. The majority had been using a smartphone for more than 2 years and there was no significant difference between age and years of using smartphones ($p=>0.05$). Also, a majority had used a tablet for less than 2 years. There was a significant difference ($p<0.05$) between age and the preferred method for the future (tablets/books). A majority believed that books alone would not help them grow professionally. Overall, the participants were satisfied with using a tablet instead of books. It could be recommended that awareness about technology be improved among nursing students as the use of technology could save time, energy and resources. There should also be further research done on the aspects of current technology use in hospitals, level of ICT knowledge among international nurses, and facilitators and barriers in implementing new technology in Sri Lankan settings. This would provide a baseline for Sri Lankan nurses, which would help inform the implementation of new technology in hospitals.

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