

Bring Your Own Device and Nurse Executives Decision Making: A Qualitative
Description

by

Karen Martinez
BScN, University of Manitoba, 2002

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of

MASTER OF SCIENCE

in the School of Health Information Science

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Supervisory Committee

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Abstract

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Bring Your Own Device (BYOD) phenomenon is important in the healthcare environment because this growing trend is totally changing the workplace landscape in healthcare organizations, such as British Columbia (BC). The organizations need to be proactive and aware of this trend to decide the best way to approach this phenomenon. Currently, there is little current research that exists in Canada in context to provide a distinct understanding of the complexities and difficulties unique to this phenomenon within the nursing practice. In order to develop an understanding of BYOD in healthcare workplace, a perspective was needed of those experiencing the phenomenon of interest. The premise of this research was to explore the BYOD phenomenon from the nursing perspective. This study focused on the experiences, views, and perceptions of nurse executives/managers about how they make decisions regarding use of personal handheld devices in the workplace. A qualitative description was undertaken and the collection of data involved telephone interviews in which participants were asked to reflect on their views and/or experiences regarding BYOD in the workplace. During the literature research process, the researcher discovered that there were similar research studies previously done in the early 2000s that found early healthcare organizational concerns with the use of personal digital assistant devices (PDA) in the clinical setting. In this

study, four major themes emerged that provided an insights as to how nurse NEx/M make decisions regarding BYOD. The four major themes included: 1) management perspective, 2) opportunities, 3) disadvantages, and 4) solutions. The results of this study will aid in bringing greater awareness of BYOD to other executives and managers in nursing and should also provide information to the leaders throughout the healthcare organizations and health IT department.

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Acknowledgments

I would like to first thank Dr. Karen Courtney, my mentor and supervisor in the master program. Karen provided me with guidance and strategic direction in my thesis and helped me to navigate every aspect through my journey in this program. I would like to thank her for her patience and support through out the masters program.

I would also like to thank Dr. Elizabeth Borycki, for contributing her talents and knowledge to get me through this project.

I would also like to extend my gratitude to the study participants for their insights and time. Finally, thanks to my family and friends, who were always interested on the process of my thesis.

Dedication

I would like to dedicate this to my parents, Ruben and Rebecca Martinez, and my sister, Kaydee Carlos, who had always encouraged education and who fully supported my interests and choices in life.

Chapter 1 Introduction

Bring your own device (BYOD) is a phrase that is becoming more widely used in the corporate world and it refers to employees bringing and using their own personal mobile device (smartphones, tablets, laptops) to access the organization's applications and access data. Some organizations believe that this trend is unstoppable as mobile devices become more accessible and affordable for consumers (Bradford Networks, 2011). British Columbia (BC) hospitals are not immune to this trend and it is becoming more and more common to observe, not just the physicians but also nursing staff using their smart phones, iPads, or tablets in the workplace. Currently, there is a knowledge gap in regards to BYOD and how this relates in the clinical workplace. There is little current research that exists in Canada in context to provide a distinct understanding of the complexities and difficulties unique to this phenomenon within nursing practice.

The current state as reported by Empowered Networks based on their 2013 phone survey (n=152) with senior IT executives from five different types of Canadian services, including healthcare, showed that 60% of the respondents don't have BYOD policy in place in their organization. The same survey found that 73% of the respondents stated that some employees were using their personal devices at work. Healthcare had the highest penetration of workers using their personal devices with 28% of the respondents having reported that 50% or more employees use personal devices in the workplace (Empowered Networks, 2013). As there was limited peer-reviewed literature that was available during the development of this thesis, the background data on healthcare personal mobile device utilization was extrapolated from market and corporate

whitepapers instead of peer-reviewed studies. For example, it was found that discussion of security risks with mobile social media was disparate, fragmented, and distributed in different outlets such as academic articles, white papers, security threat reports and news articles. BYOD utilization in healthcare organizations could only be seen following an upward trend, much like in the corporate world.

1.1 Defining BYOD

BYOD is a phrase that refers to an organization's policy that allows employees to bring their own computing devices, such as smartphones, laptops and PDAs, to the workplace for use and connectivity on the secure organization's network (Astani et al, 2013). In a healthcare environment, BYOD can be described as an initiative that would allow healthcare employees to use their personal mobile devices on the organization's wireless local area network to access patient information regardless of their physical location (Malkary, 2012).

According to Healthcare Information and Management Systems Society (HIMSS), there are different models of BYOD management that can be found in organizations: 1) an ad-hoc model occurs when a healthcare professional uses their own personal device(s), and there is no official policy that exists; 2) an uncontrolled model exists when there is an informal policy or a formal policy that is not enforced, the device and application support is provided by some combination of employee, company, wireless carrier and device manufacturer; 3) a controlled is in effect when there is a formal policy that is enforced and device ownership can be mixed between company and employees but it is clearly defined; and 4) an owned is used when there is a formal policy that exists and is followed, the devices are owned and managed by the organization

(HIMSS Mobile Security Work Group, 2011). BYOD is not just about using any personal device at work; rather it is considered a variety and combination of policy models that allow for device use and aid with the management and use of personally owned devices by employees for work purposes.

1.2 Significance in Healthcare Organizations

The BYOD phenomenon is important in a healthcare environment because this growing trend is totally changing the workplace landscape in healthcare organizations. Organizations need to be proactive and aware of this trend to decide on the best way to approach on this phenomenon. Currently, this trend could be a silent demand from healthcare workers due to their being greater flexibility and access to company data from their mobile devices. According to the Ponemon Institute (2012) study, where 324 people interviewed from 80 different healthcare organizations in the U.S., found that 81% of U.S. healthcare organizations permit employees and medical staff to use their own mobile devices such as smartphones or tablets to connect to their networks or enterprise systems such as email. From the same study, it was found that 51% of employees were bringing their own devices to a facility and 94% of healthcare organizations in the study have had at least one data breach in the past two years with unspecified reasons being the cause (Ponemon Institute, 2012). Canadian healthcare environment compared to the U.S. healthcare environment is lagging behind in technology advancement. In the literature (Harple et al., 2013; Horng et al.; 2012, Moyer, 2013), U.S. healthcare organizations have already implemented some type of information systems in the organizations where information was electronically readily available and, hence, one could assume that the rate of adoption of BYOD in the U.S. could be much higher than in Canadian healthcare

environments. These numbers should be a concern for healthcare organizations due to the sensitive nature of the information being handled in a clinical setting on a daily basis. Securing private information could become difficult when unsecure personal devices were accessing the organizations' network and applications.

1.2.1 Privacy Act

The Freedom of Information and Protection of Privacy Act (FIPPA) is a provincial government act that requires public institutions, such as healthcare organizations, to closely protect the privacy of individuals with respect to personal information held by any government organization and to provide those individuals with a right of access to their information ("Guide to the Freedom of Information and Protection of Privacy Act", n.d.). With the provincial development of electronic health records initiatives and an increase in the number of electronic devices used in healthcare organizations for patient monitoring, asset tracking, and consultation, BC developed a new e-health Personal Health Information Access and Protection of Privacy Act. This act builds on FIPPA but is tailored to electronic health records (eHealth Privacy, n.d.). This act covers how the personal information is being shared, accessed and collected electronically while providing privacy for individuals.

An increase in utilization of personal handheld devices in healthcare organizations will have an effect on privacy and the security maintenance of the organization. There are two different types of threats to the privacy and security of patients' information that personal handheld devices can bring into the workplace, namely: internal and external threats (eHealth Privacy, n.d.). Internal threats occur when unsecured personal devices are brought and used to access the organization's network or information. For example,

healthcare clinicians are seen using their mobile devices to communicate with one another, including using text messaging. However, using text messaging to other mobile devices to send personal health information will violate the security regulations of the FIPPA of British Columbia (BC) because texts are sent and stored in clear text rather than encrypted. FIPAA of BC requires that personal health information at rest and in transit be encrypted (“Guide to the Freedom of Information and Protection of Privacy Act”, n.d.).

An example of an external threat occurs when a personal handheld device contains confidential information from work that is being taken out of the organization’s premises; the private personal information in the devices could be leaked outside the organization’s walls due to a loss or theft of a personal device. A loss or stolen personal device that contains patient information is equivalent to taking a patient’s chart out of the organization’s premises without the permission of the patient or the organization. Saving personal information in an unsecured personal device that is taken out of the organizations’ network or premises would violate the regulations of FIPPA of BC (“Guide to the Freedom of Information and Protection of Privacy Act”, n.d.). Given all of the sensitive information and regulatory requirements in the hospitals, there is a need to explore BYOD and how this relates to the nursing workplace.

1.3 Research Objective

In order to develop an understanding of BYOD in the healthcare workplace, a perspective was needed of those experiencing the phenomenon of interest. The premise of this research was to explore the Bring Your Own Device (BYOD) phenomenon from the nursing perspective. As Registered Nurses (RNs) represented a majority in the

healthcare workforce, this study focused on the decisions of the nurse executives, who manage nursing staff and have responsibilities for policy development and implementation. This study focused on the experiences, views, and perceptions of nurse executives/managers (NEx/M) in terms of how they make decisions regarding personal handheld devices used in the workplace. Recognizing the perceptions of NEx/Ms regarding the use of personal devices in the workplace is one of the first steps to making better clinical decisions. Therefore, the objective of this study was to understand how nursing executives make decisions to address BYOD with the nursing staff.

1.4 Research Questions

This study was designed to answer the following two research questions:

1. How do nurse executives make decisions regarding BYOD?
2. What elements do nurse executives believe a BYOD policy should include?

In the next section of this thesis the researcher will provide a literature review.

Chapter 2 Literature Review

The purpose of this study was to provide a qualitative description of how nursing executives/managers (NEx/M) were making decisions to address BYOD. In this chapter the literature review is presented along with a pertinent discussion of BYOD devices and the issues in literature associated with the use of these devices. Past research involving personal device use (as a platform) in healthcare is also discussed as part of this chapter. The chapter will begin with a description of the historical use of electronic personal devices in the healthcare environment, from pagers to smartphones. One particular type of electronic personal device that this chapter will focus on is the Personal Digital Assistant (PDA) devices. PDAs were the first personal handheld mobile device adopted by health professionals. Therefore, this chapter will discuss this device from a historical perspective. Initially, PDA's and the issues associated with their use (in the literature) will be reviewed. Then, the discussion will focus on BYOD and BYOD issues in the literature. Chapter 2 will also discuss the role of nurse executives/managers that would be pertinent to technology use in the workplace. The chapter ends with a discussion of the methodological and measurement criteria incorporated into the current research.

A literature search was performed using the following tools to search for electronic resources: the University of Victoria online library, PubMed, Google scholar, and Google. The literature from the years 2000 to 2008 uses the terms "Personal Digital Assistant devices" or "PDA" as used in a "clinical setting" or "hospital". The researcher used literature in this review that was published starting from 2009 through today using a combination terms such as "BYOD" or "tablet/iPad" or "smartphones" in "clinical

setting” or “hospital”. There were efforts to restrict articles to those that were peer-reviewed literature, however, there were a limited number of peer-reviewed articles that were available. Therefore, market and corporate whitepapers were included to provide some background data on healthcare personal mobile device use.

2.1 Pagers to Smartphones

According to Ammenwerth et al. (2000), healthcare professionals, such as physicians and nurses, were found to be highly mobile in their daily hospital routine, moving frequently between wards, outpatient clinics, diagnostic and therapeutic departments, conference rooms and operating theatres. Pagers were the main mobile communication device that was highly used by healthcare professionals until cellphones became widely available in the early 1990s (Burdette et al., 2008). Then in the mid-1990s, Personal Digital Assistants (PDAs) enabled healthcare professionals to organize their contacts, calendars, and journals electronically, adding another device in their pockets (Mosa et al., 2012). When smartphones became available for consumer use, health professionals began to use these devices to address their high mobility needs. Health professionals started to replace multiple devices with single device, which functions as a cellular, pager, and PDA. Furthermore, smartphones and tablets became popular because they also offered advanced computing and communication capability, including, for example, Internet access and geo-positioning systems (GPS) that have an intuitive user interface and natural gesture control (Boulos et al., 2011).

2.2 Historical Devices – Personal Digital Assistant (PDA)

The mobile nature of the healthcare profession made the concept of using a mobile technology attractive in the clinical setting. Early forms of personal mobile devices included personal digital assistants (PDA). One article mentioned that it was the introduction of the Palm Pilot in 1996 that revolutionized healthcare (Kuziemsky et al., 2005). The PDA had two major operating systems: the Palm Operating System (Palm OS) and the Pocket operating system (Windows based) (Zurmehly, 2010). The PDA used touch screen technology with either a stylus or keyboard with standard functions, such as a calculator, calendar, address book, memo pad, and to-do list. The PDA was, generally, built to the size of a calculator and could easily fit into a hand or a pocket.

The recurrent theme in the literature in regards to the PDA was that it was an ideal solution at point-of-care (Lu et al, 2005; Mendonça et al., 2004; Tooley & Mayo, 2003). Lu et al. (2005) found that the PDA provided communication, real-time access, time-saving integration, customization, and evidence-based support that enhanced productivity and quality of care that together assisted in improving clinician efficiency and effectiveness in the clinical setting. The perceived enhanced productivity associated with the use of PDAs in the clinical setting was also supported in a comprehensive literature review done by Kuziemsky et al. (2005). Further, in another literature review article, Zurmehly (2006) found numerous research studies that provided evidence-based results that indicated that the use of PDAs was an effective teaching-learning strategy in nursing students. Unlike the hardcopy edition articles, which could be obsolete at the time of printing, PDA-based electronic medical references could be readily updated. Despite the many benefits associated with the use of PDAs in the workplace, there were issues that

were found in the literature regarding their utilization in the clinical setting. For example, other research found that user interface issues in conjunction with the size of the device might lead to an increased risk for medical errors as the PDA's popularity increased among medical residents, physicians, nurses, and pharmacist who were amongst the early adopters of PDA in the clinical setting, particularly during education and training (Kushniruk et al., 2005; Lu et al., 2005; Scollin et al., 2006).

2.3 Personal Digital Assistant (PDA) – Issues in the Literature

In the articles, between the years of 2000-2008, both the benefits and issues associated with PDA utilization in the clinical setting were numerous. Issues associated with privacy and security, cost, and hardware were found in the literature regarding the early use of PDAs in the clinical setting. Due to the PDA's mobile capability and the information intensive nature of healthcare environment, privacy and security was the most discussed issue in the literature regarding PDA use in the clinical setting.

2.3.1 Privacy and Security issues

Healthcare professionals could be seen constantly recording and exchanging information, which always raises the question of privacy and security. In early studies of PDA use, there were already concerns about wireless technology compliance with privacy legislation, such as Health Insurance Portability and Accountability Act (HIPAA) in the U.S. (Courtney et al., 2005; Mendonça et al., 2004) or the equivalent of Freedom of Information Protection Privacy Act (FIPPA) in Canada. Some studies found that PDAs were small and was easy to misplace or could be stolen. This would lead to security and confidentiality issues if the device were stolen if patient information data was saved on the device (Berglund et al., 2007; Tooley & Mayo, 2003). Additionally, Tooley and Mayo

(2003) stated that the portability of the PDA was a great advantage, however, the patient information loaded onto a PDA had the potential of becoming unsecured and could easily be accessed by unauthorized individuals. Equally, many publications in the literature have voiced concerns about the privacy and security of PDAs. These researchers have made suggestions about how to secure the device and the information stored within it. Some of the studies suggested the use encryption (Thompson, 2005); strong authentication and authorization confirmation (Mendonça et al., 2004; Thompson, 2005); improvements to the physical security of the devices, and penalty development and implementation (Tooey & Mayo, 2003) because it was found that without these policies in place one could place healthcare organizations at great risk.

Privacy and security has been discussed quite extensively in the literature regarding PDA use in the clinical setting. Cost was another key matter that was found to have a fair amount of discussion in the literature.

2.3.2 Cost issues

One of the benefits of PDA, as previously mentioned, was that it was an effective teaching-learning strategy in the clinical setting for students. However, some articles reported that the initiation of hardware and software maintenance of the PDA could be costly (Miller et al., 2005; Scollin et al., 2006; Thompson, 2005). There were mixed reports regarding the cost of purchasing and maintaining PDAs. For example, Kuziemyk et al. (2005) reported that the cost was fairly inexpensive and the software was easily accessible through the local development or downloaded from freeware or subscription sites. Conversely, according to both Scollin et al. (2006) and Zurmehly (2006), although it is low in cost in comparison to textbooks and other reference texts, the software was

costly beyond the available freeware. Scollion et al. (2006), reported that typical PDAs range in price from \$130 to \$500, and individual medical/nursing databases can cost from \$29 to \$50 per database. Thompson (2005) also pointed out that programs that were commercially available for the PDAs such as drug guides, medical dictionaries, laboratory and diagnostic test norms can cost approximately \$30-\$100. In addition to this, to have adequate memory and run time required purchasing either an expansion card on lower-cost devices or a more expensive model of PDA with corresponding larger memory chips (Scollin et al., 2006). Lu et al., (2005) found that there was a steep cost associated with acquiring a PDA, and that healthcare professionals also found the device to have major hardware issues and that led to repairs that could also add to the cost of owning the device.

2.3.3 Hardware issues

In the early 2000s, PDAs were seen being used in high numbers by healthcare professionals for patient management in the healthcare environment. With time, issues associated with the hardware arose as it was used frequently in the clinical setting. Some of the issues that will be discussed were associated with infection and limiting factors of the hardware device. For instance, just like stethoscopes, white coats, and gloves, PDAs were reported to be a potential source of nosocomial infection transmitted by hands or contaminated devices (Hassoun et al., 2004). In a study that was conducted in a NY teaching hospital in 2004, found that 93% of healthcare professional that participated in the study never cleaned their PDAs and 96% of the devices were cultured positive (Hassoun et al., 2004). The lack of cleaning devices, medical or electronic, was not new in the healthcare environment, this issue continued to be an ongoing issue in clinical

settings. However, the awareness of infection transmission has become more apparent with time. Therefore, health professional education and reminders about importance of hand washing and cleaning devices have also become more obvious.

Over time, some studies found the memory and battery life of PDAs were limited and were a major drawback with these early personal handheld devices (Dearnley et al., 2008; Lu et al., 2005). Initially, only 2K of memory were available on most of the devices and later on this increased to 32K as the standard (Tooley & Mayo, 2003). The size of the memory wasn't the only item that the healthcare professionals found limiting. The LCD screen size was also found to be a critical limiting factor of the PDA. The screen size of the device is not ideal for a clinical environment where the display is too small to view an adequate amount of information at once (Choi et al., 2004; Dearnley et al., 2008).

PDAs also need a full time mobile connection. In order for PDAs to update information, they require synchronization through a wireless network or through a computer connection. However, during the early 2000s, slow network connectivity was one of the biggest limitations in the healthcare organizations (Lu et al., 2005). Wireless networking was still in its early development in healthcare organizations. As a result, it was difficult to connect to the Internet to access and update a device for current research information (Berglund et al., 2007; Lu et al., 2005). Additionally, the use of wireless technology and wireless information sharing was limited in the early stages of the development of the technology due to privacy concerns and security issues due to compliance with HIPAA in the U.S. (Tooley & Mayo, 2003) or the equivalent FIPPA in Canada. In a comprehensive literature review, Lu et al. (2005) found other complaints

regarding PDA devices that included: technical difficulties due to incompatibility platforms; negative patient perception during patient examination; and organizational barriers due to a lack of institutional support and concerns for legal issues.

In conclusion, the initial issues that were found in the articles with one of the first personal mobile devices used in the clinical setting were: 1) privacy and security regarding information sharing and the consequences of loss of device, 2) the high cost for initiating and maintaining the PDA, and 3) hardware limitations with memory and battery size, screen size, infection control, and Internet connectivity.

2.4 Similarities Between PDAs and BYOD Devices

The principles behind the past use of PDA devices and the current use of BYOD devices, when compared, are quite similar. Many articles described numerous benefits of the utilization of personal mobile devices in the healthcare environment. Amongst the many benefits found were similar between PDA and BYOD devices found in the literature that will be discussed were the mobility and convenience of the devices, as well as, the benefits of efficiency and productivity associated with their use. The similarities between the devices are described in the following categories: a description of the PDA concept will be presented first and then a description of BYOD concept will then follow.

2.4.1 Mobility and Convenience

In early studies of PDAs, users who were constantly on the move found the idea of “anywhere and anytime” technology particularly useful in the clinical setting because of the size and weight of PDAs and what they offered in terms of mobility and functionality (Kuziemy et al., 2005; Lu et al., 2005). Lu et al. (2005, did a comprehensive literature review and found that the benefits of PDAs in their early use in

clinical settings were mobility, real-time access, cost-effectiveness, communication, reduced medical error, time-saving integration, customization, evidence-based support, and enhanced productivity and quality of care. From that extensive list, many would fit in the category of mobility and convenience. For example, early PDA studies have shown that mobility and convenience bring with them real-time access to information (Ammentwerth et al., 2000) by providing health professionals with decision support (Kuziemyky et al., 2005), education (Brock & Smith, 2007), and accessing or collecting data (Tooley & Mayo, 2003) at the point-of-care. Furthermore, the early studies of PDA devices found that the general advantage of the personal mobile device was that the technology provided health care professionals a vast amount of current and relevant information in an organized way within a compact portable device that was accessed at any location (Krauskopf & Wyatt, 2006; Tooley & Mayo, 2003). In fact, some studies found that information retrieval was one of the main functionalities that healthcare professionals utilize where PDAs are concerned; for example, using electronic reference tools like a pharmaceutical guide (Courtney et al., 2005; Berglund et al., 2007). One of the main goals of these early personal devices (i.e. PDAs) was to improve healthcare delivery at the point-of-care.

Similarly, according to more recent articles about BYOD, mobility and convenience are also a part of BYOD. It has been suggested that healthcare professionals prefer its use their own devices (BYOD) in their everyday personal and professional routine (Boisvert, 2012; Fierce Mobile Healthcare, n.d.; Malkary, 2012). Boisvert (2012) noted “mobile health [was] basically involved the use of mobile devices such as cell phones, smartphones, laptops, and tablet or iPad computers to collect, retrieve, and/or

deliver health information... anywhere and anytime the user chooses” (Boisvert, 2012, p. 44). Harple et al. (2013) mentioned that the conveniences associated with using these personal smartphones and tablets provided at point-of-care may not be being matched in healthcare organizations, where stationary workstations were still being used. In many areas in hospitals what was considered “mobility” was still defined as a computer on wheels (COW) that both includes the tower and monitor of a desktop computer on wheels, which could be cumbersome and heavy to manoeuvre in a hospital (Harple et al., 2013; Kabachinski, 2013). According to Kabachinski (2013), this lack of easy access to information due to the limited number of “mobile” computers did not go unnoticed by healthcare professionals. A few of the articles described documented how new handheld devices had the benefit of a full computer interface that was user-friendly, had a touchscreen, were small enough to fit in a pocket, and also had the ability to store useful applications that were accessible at the point-of-care as well as having contributed greatly in the way healthcare professionals use and access content that were found suitable in the hospital setting (Astani et al., 2013; Harple et al., 2013; Lapinsky, 2007).

Several BYOD articles suggested that the use of personal handheld devices in clinical settings enabled users to access the Internet and use thousands of applications thereby creating a culture where people are expecting to have connectivity wherever they are (Dolan, 2011; Boisvert, 2012; Kabachinski, 2013). This constant connectivity is important to clinical healthcare professionals because current and new research comes in at such a rapid pace that clinical practice could benefit from easy access to up-to-date information (Lapinsky, 2007). The advent of 3G mobile devices allowed for access to a wide range of information and application services that permitted clinicians to perform

mobile healthcare in an easy and convenient manner (Wu et al., 2011). With ease and convenient access to information at anywhere and anytime hospitals could promote a restructuring of work processes in a way that healthcare professionals could organize their day and could promote efficiency within the workplace.

2.4.2 Efficiency and Productivity

In early PDA studies, it is the efficiency of information retrieval to current information had an integral role in the healthcare professionals' practice that was found to be effective and ideal in the workplace (Ammenwerth et al., 2000; Krauskopf & Wyatt, 2006; Lapinsky, 2007; Lu et al, 2005; Thompson, 2005). The physicians and nurses who participated in Mendonça et al.'s (2004) study had emphasized that they had limited time to look up information and found that an efficient and easy point of access to relevant information sources was more useful to their clinical practice. Similarly, Kuziemyky et al. (2005) found that a medical education tool that was accessible, efficient and was seen to be a positive utility in clinical, and had improved productivity at point-of-care. In a study done in 2001 at Massachusetts Beth Israel Hospital, discovered that physicians' increased efficiency had saved 39 minutes a day in information documentation and retrieval time when they used personal tablet computers at the patient's bedside (Horng & Nathanson, 2011). The time saving aspect of using a PDA in the clinical setting was also supported by numerous studies, where they found that the convergence of all these communication capabilities into one handheld device had an impact in nursing clinical practice by reducing time-consuming and redundant work (Choi et al., 2004; Lu et al., 2005; Thompson, 2005).

A similar BYOD study was done by Harple et al. (2013) who discovered the contributions of mobile devices in reducing duplicate and redundant steps in the workflow that had strongly influenced work performance of the physicians. Additionally, Horng, et al. (2012), found that clinical use of a tablet computer was associated with a reduction in the number of times physicians logged into a computer workstation and a reduction of 38 minutes spent per shift using a computer workstation. Wu et al noted that “perceived usefulness [had] much greater influence on attitude toward using mobile healthcare than perceived ease of use” (2011, p. 592). It could be this perceived usefulness with mobile devices that assisted health workers, who were constantly on the move, in organizing and accomplishing tasks in a clinical environment that were at times unpredictable.

Furthermore, both Malkary (2012) and Roca (2012) mentioned that BYOD could increase productivity between multidisciplinary teams with improved communication and increased responsiveness. The portability feature had been argued to be a key factor that affected BYOD device use with users, especially those users who required “immediate feedback” or felt the need to interact “on-demand” (Wu et al., 2011). According to Ammerwerth (2000), it was “not only because of their mobility, but also due to their distinct patient care responsibilities that communication [was] so important for physicians and nurses” (p. 22) and that indirect communication, such as pagers fail to provide detailed information about the reason for a call and its urgency.

In conclusion, PDAs and BYOD devices provide real-time access to information by providing decision support, education, and data collection at the point-of-care. It was

this efficiency with information retrieval and connection to up-to-date information that allowed the healthcare professionals to be effective and productive in the workplace.

2.5 BYOD Devices – Issues in the Literature

In articles found between the years of 2008 to 2013, there were several benefits of BYOD that were discussed. BYOD issues were also discussed in the context of personal handheld devices used in the clinical setting. The following issues were found in the articles that will be discussed in this section of the literature review. BYOD devices were associated with privacy and security costs, distractions, and infection control issues.

2.5.1 Privacy and Security Issues

Privacy and security have been examined in relation to the topic of BYOD in both the corporate and healthcare environment. Within the privacy and security area studies that were found talked about the matter of mobile security and data breaches. These personal mobile devices were found to be susceptible to malware because the primary functions of these devices were portability not security and as a result they have weaker security systems than computers (He, 2013; Bourque & Bentfield, 2012). According to the Ponemon (2012) survey, 54% of the people surveyed who were using personally owned mobile devices at the healthcare workplace were not confident that their devices were secure and only 9% were very confident their devices were secure. It was noted by Astani et al. (2013) that most business organizations that allowed employees to bring their own devices to work were experiencing high rates of mobile threats, including lost or stolen devices, and malware that might compromise company data.

A 2012 survey reported that the percentage of U.S. healthcare organizations reporting a data breach increased in that year (Ponemon, 2012). From that same report,

the top three causes for a data breach were: lost or stolen computing devices, employee mistakes, and third-party problems (Ponemon, 2012). Ponemon (2012) found that the primary root of the data breach was insider negligence and noted 46% accounted for lost or stolen devices. Compared to computers, mobile devices were easier to lose or get stolen due to their portability and were subject to data losses or leaks more frequently than computers (Moyer, 2013). Additionally, Boisvert (2012) reported that threats to privacy and security of BYOD could also come from unsecured wireless connections in coffee cafés, airports, or hotel lobbies. Furthermore, the risks also came from daily access to social media sites or applications (apps) that use the organization's network (He, 2013) thereby risking confidential information that were being accessed with these devices. There were articles that stated that social media apps for mobile devices failed to include security measures and that cyber criminals were more likely to design malicious mobile malware (Astani et al, 2013; He, 2013). Many of the apps in these consumer devices gathered information about the users without them even knowing. Certain apps had the ability to store and send user information, such as name, passwords, location, demographic, or any other information, within its program or back to the software developers that raised additional security concerns (He, 2013, Suby, 2013). The healthcare organizations that allowed employees to access their organizations' network were also allowing social media, email, and other personal apps to access the workplace network thereby placing the organizations' security at greater risk.

Furthermore, with the popular culture of posting pictures on social media, the built in cameras in these devices allowed employees, families and even patients to take pictures readily within the organization's walls and post the pictures on social media sites

with no awareness of what was included in the image. Patient privacy in the social media age continues to be an evolving issue that requires hospitals to be proactive (Suby, 2013). Once these pictures were posted on the World Wide Web, the image could instantly spread to a large audience and cannot be fully deleted (He, 2013). Historically, data breaches have had severe economic consequences for healthcare organizations (Ponemon, 2012); therefore, the next issue that will be discussed would be regarding cost issues with BYOD that were found in the literature.

2.5.2 Cost Issues

Several articles had listed the many benefits of allowing BYOD in healthcare organizations. For example, several articles mentioned that the use of personal devices at the workplace shifted the device and maintenance costs to the owners of the device that presented a significant cost savings for the organizations (Boisvert, 2012; Moyer, 2013; Softweb, 2012). However, as previously mentioned, some reports argued that data breaches have severe economic consequences (Astani et al., 2013; Ponemon, 2012). For example, from the same 2012 Ponemon report, the economic impact of one or more data breaches for a healthcare organizations ranged from less than \$10,000 USD to more than \$1 million USD over a two-year period (Ponemon, 2012). The cost benefits were, further, disputed by a survey conducted with US, UK, and Australian businesses that had BYOD policies. The survey findings identified that 61% of employees in these businesses required additional IT resources to manage mobile security, resulting in higher costs (Webroot, 2012). This increase in support had taxed the hospital IT management resources to accommodate and manage the security of different devices that access the hospital network (Dickerson, 2012; Moyer, 2013; Roca, 2012).

It has also been reported that mobile device resulted in reduced employee productivity and disrupted clinical activities that further resulted in higher costs to the organization (Webroot, 2012). The decrease in productivity could also include disruption and distraction that could have an implication on healthcare organizations because it could affect the quality of patient care. Therefore, the next issue that will be discussed are distraction/disruption issues.

2.5.3 Distraction/Disruption Issues

In the research literature BYOD is often discussed in conjunction with opportunities to increase clinician productivity in the workplace (for the reasons previously discussed above). However, there were several articles that were found in the literature that mentioned that the use of BYOD could, actually, decrease productivity in the workplace. These articles suggest that BYOD could lead to distractions and disruptions arising from employee use of personal applications stored in their personal devices (Delloite LLP, 2009; Harmon.ie, 2011; Suby, 2013). Distractions that were described included those arising from employees' use of social media, such as Facebook during work time. BYOD was also linked to disruptions arising from employees' texting and emailing during work hours. To illustrate this issue one of the authors of one of the articles suggested that employees could stop doing their work to check for incoming texts or emails and this type of activity comes with using personal devices during work time. More recently, published survey results about BYOD noted that personal devices containing personal apps such as social media and emails caused distraction in the workplace. This in turn leads to organizational costs in terms of work time losses and lost revenues (Delloite LLP, 2009; Harmon.ie, 2011). According to the Harmon et al.'s

(2011) survey, 57% of work interruptions involved using collaborations and social tools such as email, social networks, text messaging or switching windows among other tools and applications. In the survey conducted by Deloitte LLP (2009), researchers found that 77% of workers who had a Facebook account used it at work. Of those using Facebook at work, 87% said they had no clear business reason for using the site (Deloitte LLP, 2009). Fundamentally, employees' personal devices, such as the tablets and iPads, had a huge ability and capacity to entertain users for hours and, therefore, presented a high risk in terms of decreasing productivity in the workplace.

Furthermore, according to Suby (2013), these digital distractions posed a large issue for nursing practice area because of presenteeism. As described by Suby (2013), presenteeism occurs when employees are at work, but are not performing at their peak level because of distractions. Hence, it can be argued that adding digital distractions to an already busy nursing workplace puts patients at high risk for errors, misinformation, and possibly injury because the amount of time and attention spent using personal devices rather than attending to the patients' needs. Presenteeism could also be an issue for healthcare organizations because of three things: 1) the decrease in quality of patient care associated with digital device use, 2) the potential cost to the healthcare organization due to errors, misinformation, and injury towards the patients, and 3) the implications or scrutiny on the nursing practice when nurses could be visibly seen on their personal devices doing personal activities during work time (Suby, 2013).

Conversely, the disruptions of personal texts, emails, or social media could result in an increased use of personal devices in the clinical setting which increases the risk for harbouring a potential infection on the device and a risk of transferring the infection due

to the mobility nature of the device. Hence, infection control issues regarding the use of personal devices in the clinical setting will be the next issue to be discussed.

2.5.4 Hardware Issues - Infection Control

Infection control was another key issue that all healthcare organizations dealt with when devices were being used in a clinical setting. Studies have found that mobile devices were a reservoir and source of bacterial cross contamination between individuals and patients who came into direct contact with these devices (Brady et al., 2009; Manning et al., 2013). A device' mobile aspects could easily lead to a spread of bacterial pathogens from patient to patient. According to Brady et al. (2009), pathogenic bacteria that had taken up residence on the screen or casing of a device that could easily transfer bacteria via the fingers and fingertips to the eyes, mouth, or nose of the user or to a hospitalized patient at the point-of-care. Horng et al., (2012) mentioned that these devices should be considered much the same as with other machines used in the workplace due to the risk of spreading nosocomial infections from patient to patient.

In conclusion, the issues found in the literature with BYOD use in the clinical setting included: 1) privacy and security issues due to susceptibility to malware, data breach due to lost devices, user mistakes, and third-party problems, 2) cost issues for the healthcare organization due to potential data breaches, 3) distraction/disruption issues due to social media, email, and texts that decrease productivity in the workplace, and 4) infection control issues with the device being the source of bacterial cross contamination between patients.

2.5.5 Summary of Issues

The following table is a summary of the issues found in the literature regarding the historical PDA device as compared to the issue presented in the literature for BYOD as outlined in the Literature Review.

Table 1 Reference Summary of Issues of PDA and BYOD

ISSUES	PDA References	BYOD References
Privacy & Security Issues	<u>Device compliant with FIPPA/HIPPA</u> <ul style="list-style-type: none"> • Courtney et al., 2005 • Mendonça et al., 2004 • Tooley & Mayo, 2003 <u>Theft & Stolen device</u> <ul style="list-style-type: none"> • Berglund et al., 2007 • Tooley & Mayo, 2003 	<u>FIPPA/HIPPA</u> <ul style="list-style-type: none"> • Bourque & Bentfield, 2012 • Moyer, 2013 • Ponemon, 2012 <u>Susceptible to malware</u> <ul style="list-style-type: none"> • He, 2013 • Bourque & Bentfield, 2012 <u>Increased data breach</u> <ul style="list-style-type: none"> • Astani et al., 2013 • Ponemon, 2012 <u>Data breach: negligence, lost device, unsecured wireless</u> <ul style="list-style-type: none"> • Boisvert, 2012 • Moyer, 2013 • Ponemon, 2012 <u>Data breach: access social media site, apps, personal emails</u> <ul style="list-style-type: none"> • Astani et al., 2013 • He, 2013 • Suby, 2013 <u>Loss of privacy: photography</u> <ul style="list-style-type: none"> • He, 2013 • Suby, 2013
Cost Issues	<u>Expensive hardware & software</u> <ul style="list-style-type: none"> • Miller et al., 2005 • Scollin et al., 2006 • Thompson, 2005 <u>Hardware cheaper than textbooks but expensive software</u> <ul style="list-style-type: none"> • Scollin et al., 2006 • Zurmehly, 2006 <u>Expensive memory upgrade</u> <ul style="list-style-type: none"> • Scollin et al., 2006 	<u>Severe economic consequences with data breaches</u> <ul style="list-style-type: none"> • Astani et al., 2013 • Ponemon, 2012 <u>Increased demand on IT resources</u> <ul style="list-style-type: none"> • Dickerson, 2012 • Moyer, 2013 • Roca, 2012 • Webroot, 2012 <u>Decreased in productivity</u> <ul style="list-style-type: none"> • Webroot, 2012

Hardware Issues	<u>Small screen size</u> <ul style="list-style-type: none"> • Choi et al., 2004 • Dearnley et al., 2008 <u>Limited memory and battery</u> <ul style="list-style-type: none"> • Dearnley et al., 2008 • Lu et al., 2005 • Tooley & Mayo, 2003 <u>Difficulties with wireless network</u> <ul style="list-style-type: none"> • Berglund et al., 2007 • Lu et al., 2005 • Tooley & Mayo, 2003 <u>Infection Control</u> <ul style="list-style-type: none"> • Hassoun et al., 2004 	<u>Infection Control</u> <ul style="list-style-type: none"> • Brady et al., 2009 • Horng et al., 2012 • Manning et al., 2013
Distractions/ Disruptions Issues	No reference found	<u>Decrease productivity: social media, texts, personal email</u> <ul style="list-style-type: none"> • Delloite LLP, 2009 • Harmon.ie, 2011 <u>Presenteeism</u> <ul style="list-style-type: none"> • Suby, 2013

2.6 Nurse Executives and Managers as Decision Makers

Health care organizations and their leadership have changed during the past two decades. There had been reductions in financial resources, advancement in technologies, rapid increases in new forms of information that have contributed to these changes (Hyrkäs et al., 2003). Conrad and Sherrod (2011) stated that the surge in technology use had made an impact on nurse managers' decision-making, for they were now at the frontlines of patient-care delivery systems and could lead the way in influencing quality, efficiency, and integration of effective use of electronic technologies. Generally, nurse managers are at the center of the action when organizational leaders want something implemented.

The discussion of personal device use in the clinical setting has taken a front seat due to its obvious visibility in the workplace in healthcare organizations and

administrators attempt to get a handle on its management. Nurse managers were considered as they were well versed with organizational policies where they participate as decision makers, policy makers, and implementers in the clinical setting (Tooey & Mayo, 2003). Furthermore, nurse managers represent nursing clinical practice needs and could facilitate/advocate whether the use of a personal device are within the technical and legal framework of an organization or are mutually beneficial to nursing practice and patients. Nurse managers have a level of understanding of both worlds: nursing clinical practice and administration in an organization. Therefore, they would be essential in addressing the need to use personal devices in the workplace. Sharman (2007) mentioned that for an already cash-strapped healthcare system, information that could be gathered and transmitted by newer, faster and extensively networked technologies might add value to the solution. According to Thompson (2007), nurse managers could be integral in making the decision to getting the needed tools into the hands of nurses. Nursing leaders and administrators would have the authority to provide approval and funding appropriately if such personal technology should be integrated into clinical setting and regulated in the workplace (Hall et al., 2006). Lu et al. (2005) found in their extensive literature review that one of the main barriers of adopting the use of personal devices in the clinical setting came from the organization's lack of support and concerns for legal issues. Therefore, as decision makers, the nursing managers need to have a level of understanding of both worlds, the administration world and nursing staff world, to gain an understanding between policy and practice, especially when clinical practice and technology advancement continually changes.

2.7 Summary

Healthcare organizations cannot ignore the fact that there is a rapid acceptance and ongoing swift development of handheld computer technology that is leading an evolution in the way clinical data and information move to and from the bedside, whether these devices are either owned by the users or by the organizations. Because of the fragmented and unreliable tools and systems that were available in the organization, the professionals often relied on their own tools and strategies to effectively obtain information they needed and that were always on hand (Harple et al., 2013). Hence, it seems that the logical progression that these consumer mobile devices started filtering into the clinical environment setting in order to stay connected.

Since BYOD was such a new phenomenon in the nursing realm, there were limited peer-reviewed articles that illustrated defined outcomes of its use in the workplace. There were numerous peer-reviewed articles about PDAs that provided insights into the similarities and issues between PDAs and current day devices. Much of the literature found for both PDAs and currently used BYOD devices were focused on physicians and their use of these technologies. Physician adoption risks and benefits accrued to physicians in using these devices in the clinical setting were also a concern. Therefore, the objective of this research study was to explore this phenomenon beginning with a qualitative description of how nursing executives/managers were making decisions to address BYOD within the nursing realm.

Chapter 3 Methodology

The purpose of this study was to explore BYOD phenomenon by seeking to learn more about how nursing executives/managers (NEx/M) were making decisions to address BYOD within the nursing staff. Therefore, a qualitative descriptive design was chosen for this study to obtain a clear description of a specific phenomenon from the perspective of the experiencing individual (Magilvy & Thomas, 2009), and the description entails a presentation of the facts in everyday language (Sandelowski, 2000). Qualitative designs allow researchers to employ in-depth interviews that yield rich participant narratives that allow the researcher to gain a comprehensive understanding and descriptions of participant thoughts, feelings, and opinions (Creswell, 2009; Jackson & Verberg, 2007).

There were three types of content analysis of conventional, directed, and summative content analysis. The other two content analysis, directed and summative, was identified as not fitting for what was needed in this study. Directed content analysis approach is done when there is already an existing theory and the goal is to validate or extend the theoretical framework (Hsieh & Shannon, 2005). Summative content analysis approach is regarding identifying and quantifying words or content in text but not to infer meaning but, rather, to explore quantity usage (Hsieh & Shannon, 2005). Conventional content analysis was then chosen as the analysis strategy because it is performed by coding categories derived directly from the text data, and can be used to describe a phenomenon that has limited research literature published about it (Hsieh & Shannon, 2005). The conventional content analysis allowed the researcher to collect data through open-ended interview questions that provided the participants with the opportunity to respond in their own words. According to Turner (2010), standard open-ended questions

have the ability to evoke responses that were much more detailed, meaningful, and culturally relevant to the participant and it allowed for probing questions to be asked as means of follow-up. Therefore, this research design approach elicited unique perspectives and experiences that provided a descriptive understanding of the decisions NEx/M were making regarding BYOD.

3.1 Participants

A purposeful sampling of NEx/M working in the two health authorities, Vancouver Coastal Health Authority (VCHA) and Island Health Authority (IHA), were recruited for this study. Purposeful sampling is a process where participants are selected on the basis of their particular experience related to the phenomena (Creswell, 2009; Jackson & Verberg, 2007). The recruitment criteria for NEx/M were defined as registered nurses holding the title of director or manager (i.e. Nurse Managers, Nursing Directors, Nurse Administrators) who maintained one or more patient care unit. The participants in this study had one or more years of experience in the NEx/M role. The years of experience of the participants in their managerial roles and the management of one or more patient care unit were taken into account for the reason that experience allowed them to possess a creative, innovative, and adaptive decision-making activity to take on the current issue and learn from prior experiences (Effken et al, 2010), and have enough knowledge of the organizational policy. NEx/M from various departments were included, such as community, ward, acute care, and critical care areas, seeking a diverse perspective and experiences of the participants from the two health authorities. For further background on the participants, the participants from IHA had experience in using an electronic health record information system that has been implemented in the

organization, as opposed to the participants from VCHA where electronic health records have not started the implementation of an electronic health record in the organization. A final number of 10 participants were enrolled in the study when data saturation was reached. Data saturation refers to a situation in data analysis where the participants' descriptions become repetitive and confirm previously collected data rather than adding new information. It is when the researcher believes that data analysis has reached saturation and data collection is complete (Jackson & Verberg, 2007).

3.2 Human Subjects Approval

This study was approved by University of Victoria (UVic) and Island Health Authority (IHA) Joint Research Ethics Sub-committee in Human Research Ethics (Appendix A: UVic/IHA Joint Research Ethics Sub-Committee Certificate of Approval). The certificate of approval from the joint research ethics from UVic/IHA was honoured by the Vancouver Coastal Health Research Institute. Approvals were also obtained from each institution to conduct research on site (see Appendix B: IHA Institutional Approval To Conduct A Research Project; Appendix C: VCHRI Vancouver Coastal Health Authority Research Study).

3.3 Recruitment

The recruitment process for the study required following specific and very different procedures from each health authority's research institute. The recruitment of the participants was achieved in two ways. First, the letter of invitation to participate in the study (Appendix D: Letter of Invitation) was directly emailed to the potential participants in Vancouver Coastal Health Authority (VCHA). A distribution list was

obtained using the internal employee email address list as suggested by the Vancouver Coastal Health Research Institute (VCHRI). This method of recruitment was possible because the researcher was a current employee of VCHA. Secondly, the IHA Research department assisted the researcher in contacting the directors from each department to provide an email distribution list of NEx/M from each of their departments. The email distribution list was then used to email the letter of to participants as part of the recruitment process.

Participation in the study was voluntary and required informed consent (Appendix E: Consent Form). The consent forms were sent to and returned by all 10 participants electronically via email. No monetary benefits were gained for participating in the study. Participants were assured that they would not be identified in the study and unique code numbers were assigned to each participant. A master list of all study participants with name, contact information, corresponding code numbers, and the copy of policy documents were kept in a locked file. Any materials with the participant's identity, such as the signed consent form, and interview transcripts were kept in separate locations to maintain participants' confidentiality. The personal home computer that contained the research data was fully encrypted and protected by firewall along with being kept in a locked drawer within a locked office for further security. No representative from any of the organizations employing study participants had access to the data.

3.4 Data Collection

The participants who responded to the letter of invitation were screened for the inclusion criteria before enrolling in the study. All the data collection for the study was done via telephone interview. All interviews lasted approximately 30 minutes and were

audio recorded, using a telephone adapter for transcription purposes. The primary researcher of this thesis conducted all the interviews, transcription, and analysis.

An interview guide was adapted from the work of McNamara (2009) and was used to assist the researcher in conducting the interview process. As part of the interview, eight demographic questions were administered at the beginning of the interview, asking the participants questions such as age, gender, education, and years of experience in nursing and in managerial roles. The demographic questions were then followed by eight in-depth semi-structured open-ended questions including two-three probe sub-questions for follow-up that was prepared beforehand that assisted the interviewer in gathering relevant information to help answer the research question (Appendix F: Demographic & Interview Questions). The in-depth open-ended interviews allowed the participants to fully express their viewpoints and provided the researcher with a thick and rich qualitative data (Turner, 2010). The questions asked covered areas of the participants' experiences, opinions, and knowledge regarding the personal handheld devices in the workplace. Each interview was transcribed verbatim and analyzed before the next interview took place. Therefore, subsequent interview questions sequence and phrasing changed based on the findings from the initial analysis of the previous interview. This iterative process of data collection and analysis systematically allowed the researcher to capture all potential relevant aspects of the topic as soon as they were perceived (Corbin & Strauss, 1990). During the interview the researcher also took notes for the purpose of reviewing content accuracy with participants and for reflective journaling immediately after each interview. A unique code number was the only identifier for each corresponding interview, for confidentiality purposes.

3.5 Demographic Data Analysis

Descriptive statistics (frequency, mean, etc.) were used for demographic data analysis. This descriptive data statistics provided additional information and assisted in the understanding of the participants' responses in relation to their backgrounds. Descriptive statistics collected were of the participants' age (less than 40 years old, 40-50 years old, and more than 50 years old), level of education (baccalaureate degree and masters degree), years of experience in nursing and in their role (under 5 years, 5-15 years, and more than 15 years), and types of departments they managed (ward, community, critical care, and combination of departments). The examination of the descriptive statistics provided additional information for the participants' interview responses to the questions related to their opinions of personal handheld devices and their educational background for a particular interest in the topic.

3.6 Interview Data Analysis

For data accuracy, the audio recordings were transcribed verbatim and checked by comparing simultaneously (i.e. listening to the audiotapes and reading the transcripts). Immediately following each interview, the researcher reviewed the notes and summarized the preliminary themes emerging from the interview. To understand the decisions nurse executives were making with BYOD, the transcribed interview data were analyzed through a process of content analysis. Content analysis is defined as a "research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns" (Hsieh & Shannon, 2005, pg. 1278). A qualitative computer software program, Atlas.ti, was used to help with organization and coding of the transcribed data (Atlas.ti Scientific Software Development

GmbH, 2014). Atlas.ti assisted the researcher in organizing the transcribed data from each interview and analyzed the data into codes in a more systematic approach. The tool allowed the researcher to continually re-evaluate the codes across multiple documents for counts, the owner (participant) of the statement, and what phrase was used.

The analysis began as soon as the data were collected and followed an iterative process to find emerging concepts and preliminary codes. The qualitative content analysis allowed the method of analysis to be reflexive and interactive as the process continuously modifies the treatment of data to accommodate new data (Sandelowski, 2000). Therefore, the evolving pattern of preliminary codes and themes helped guide probes that supplemented responses to the eight open-ended questions in subsequent interviews. During the coding process, the transcript of each interview was reviewed multiple times and the data reduced to codes and then the codes that were found to be conceptually similar in nature or related in meaning were grouped in categories. These identified codes were direct participant quotes. To prevent code drifts, a constant comparison of the data were undertaken while developing code definitions (Creswell, 2009). Codes and categories from each interview were compared with the other codes and categories from other interviews for common links.

The second level of analysis was generating themes from these categories. The generated themes provide an initial description of the decision nurse executives were making with BYOD. The generated categories and themes were then discussed in collaboration with my thesis supervisor and committee for data analysis accuracy. The coding process was repeated from step one until data analysis reached saturation and consensus was found.

The final step was theme interpretation, which was deriving meanings and understanding from the research findings. Conventional content analysis had the advantage of gaining direct information from the study participants without imposing preconceived categories (Hsieh & Shannon, 2005). Therefore, the information emerged from the actual data. The expected outcome of qualitative descriptive studies was a straight descriptive summary of the informational contents of data that was organized in a way that best fit the data (Sandelowski, 2000). This summary then provided a rich description and understanding of the decisions nurse executives were making regarding BYOD.

3.7 Credibility

To ensure qualitative data accuracy and credibility, the researcher incorporated three techniques used in the research to support rigor in the study: member checking, rich description, and peer debriefing. Member checking process was done by taking notes while actively participating in the interview process then reviewing the content with the participants immediately after. Throughout the process, the researcher asked the participants if the information was accurate for this way “the participants add[ed] credibility to the qualitative study by having a chance to react to both the data and the final narrative” (Creswell & Miller, 2000, pg. 127). Rich description of the results were also done to provide vivid detail to help readers understand that the account was credible and enabled readers to make decisions about the applicability of the findings to other similar contexts (Creswell & Miller, 2000). Using a rich, thick description to convey the findings can provide readers a more details of the setting or perspective about the theme and the results can become more realistic and richer. To further ensure credibility of the

data analysis and results, a constant collaboration with the thesis supervisor and committee was conducted throughout the process in the study. In this way, peer debriefing provided the researcher feedback and served as a sounding board of ideas, therefore, adding credibility to the study (Creswell & Miller, 2000). Lastly, to enhance the research design validity, all audio-recorded interviews were transcribed verbatim allowing the ability to retrace steps of the analysis back to the original study process.

Chapter 4 Study Findings

The purpose of the study design was to generate an understanding of how the nursing executives/managers (NEx/M) were making decisions to address BYOD where nursing staff was concerned. A qualitative description was undertaken thru the collection of data from participants using a demographic questionnaire and an interview guide with eight semi-structured open-ended questions. Data collection involved telephone interviews in which participants were asked to reflect on their views and experiences regarding BYOD in the workplace. The analysis began as soon as the data was collected and followed an iterative process to find emerging concepts and preliminary codes. In the following sections, the synthesis of the demographic and data analysis is presented. Qualitative descriptive findings of the data were achieved in collaboration and discussion with the thesis committee led by Dr. Karen Courtney as supervisor, and Dr. Elizabeth Borycki as committee member.

4.1 Demographic Characteristics of Participants

A purposive sample of 10 nurse executive/managers (NEx/M) working in two health authorities: Island Health Authority and Vancouver Coastal Health Authority in British Columbia participated in the study. The demographic characteristics of the respondents are in Table 1. The mean age of the participants was 44.3 years. The participants reported 7-37 years of experience in nursing (mean = 21 years). Additionally, experiences in the nurse manager role ranged from 1-22 years (mean = 9.15 years). Education background included five of the NEx/M have masters degrees; one in nursing, four had a combination of leadership with research, health, or arts. The other half reported a baccalaureate degree in nursing. Two participants reported to managing a

single unit while the other participants managed multiple units (medical/surgical unit, critical care unit, and community area).

Table 2 Demographic Characteristics of the Participants

Characteristics	Total Sample
Gender	
Male	3
Female	7
Age (Mean age = 44.3 years)	
Less than 40 years old	3
40-50 years old	4
More than 50 years old	3
Nursing Experience (Mean years in nursing experience = 21 years)	
Less than 40 years old	3
40-50 years old	4
More than 50 years old	3
Experience in the role (Mean years in the executive/managerial role = 9.15 years)	
Under 5 years	4
5-15 years	3
More than 15 years	3
Education	
Baccalaureate degree	5
Masters degree	5
Departments	
Community area	1
Critical Care Units	1
Combination (Med/Surg, Critical Care)	6
Combination (Med/Surg, Critical Care, Community)	2

4.2 Research Questions 1: How Are Nurse Executives/Managers Making Decisions?

Four major themes of how NEx/M make decisions regarding BYOD that were discovered from the analysis were discussed and reviewed with the committee and determined to be pertinent for this study. The four major themes in this section were

discussed to address the first research question of how NEx/M make decisions regarding BYOD that was posed in Chapter 1. The four major themes included: a) management perspective, b) opportunities, c) disadvantages, and d) solutions. Table 2 summarizes the four major themes and sub-categories that were identified and as it related to the first research question.

Table 3 Research Question 1 Themes

DECISION MAKING	
Themes	Findings
Management Perspective	<ol style="list-style-type: none"> 1) Clinical use <ol style="list-style-type: none"> a) I see the value but... b) Utilization: Who, what, and how c) Infection control issues 2) Acceptance standpoint <ol style="list-style-type: none"> a) Will not be accepted or happen 3) Professional responsibility <ol style="list-style-type: none"> a) To reliable accessible information b) To standard of care c) Continuous learning
Opportunities	<ol style="list-style-type: none"> 1) Move forward with technology 2) Convenience <ol style="list-style-type: none"> a) Being mobile b) Easy access to information c) Device familiarity 3) Interpersonal relationship <ol style="list-style-type: none"> a) Patient education b) Patient communication
Disadvantages	
<ul style="list-style-type: none"> • Patients 	<ol style="list-style-type: none"> 1) Loss of privacy, security, and confidentiality <ol style="list-style-type: none"> a) Loss of device 2) Loss of quality in patient care <ol style="list-style-type: none"> a) Loss of human contact b) Potential for errors c) Information trustworthiness
<ul style="list-style-type: none"> • Staff 	<ol style="list-style-type: none"> 1) Decrease productivity <ol style="list-style-type: none"> a) Interruptions and distractions b) Inappropriate use 2) Negative Reflection on professional practice 3) Incomprehension of consequences
Solutions	<ol style="list-style-type: none"> 1) Staff communication and education 2) Set clear guidelines

- | | |
|--|--|
| | 3) Information storage solutions |
| | 4) Organization to provide the tools and resources |

4.2.1 Management Perspective

The management perspective was identified to be one of the major themes to help determine what NEx/M general thoughts regarding the use of handheld devices in the clinical setting. The management perspective involved the participants' standpoint as it impacted the role and responsibilities to the department they were managing. This theme provided a glimpse of what the NEx/M positions were on the subject matter based on three sub-categories that were identified: 1) clinical use, 2) acceptance standpoint, and 3) professional responsibility. The first study finding that will be discussed is the NEx/Ms' management perspective of the impact of BYOD in relation to clinical use.

4.2.1.1 Clinical Use

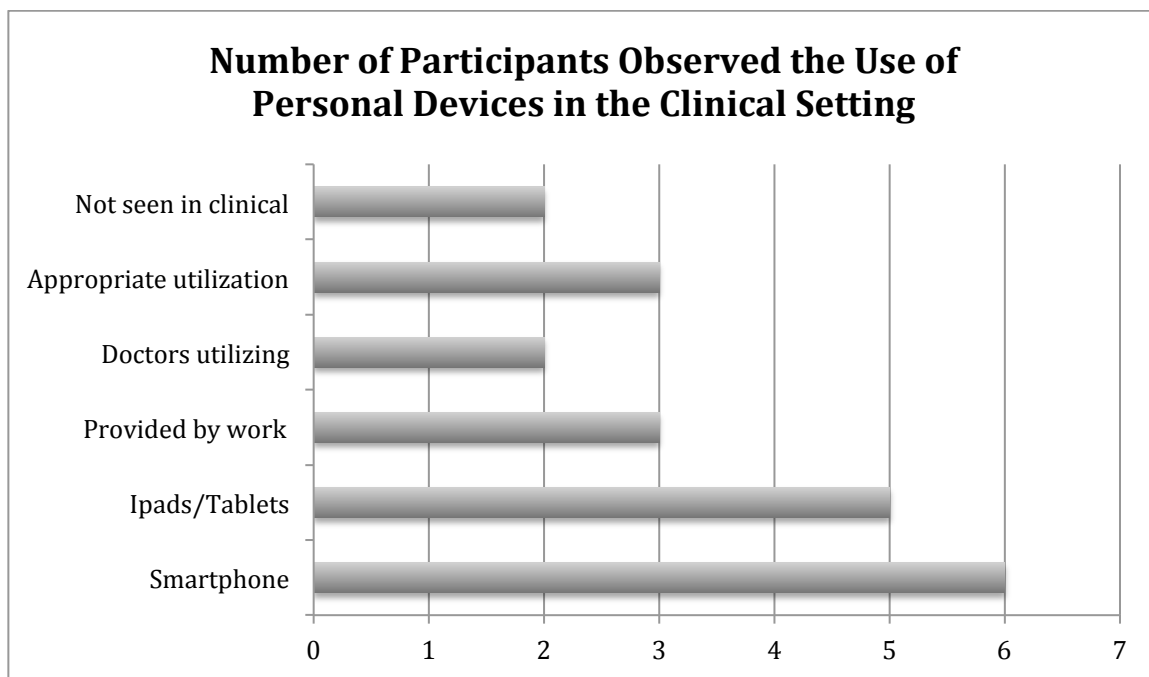
The clinical use sub-category described the participant's observations and perspective on the utilization of personal devices in the clinical setting. This sub-category explored the participants' observations regarding the utilization of these personal handheld devices in clinical.

Table 4 Theme 1 Management Perspective: Clinical Use

THEME	FINDINGS
Management Perspective	Clinical use
	<ul style="list-style-type: none"> a) Utilization: Who, what, and how b) I see the value but... c) Infection control issues

Clinical use, from the management perspective, described who the users were, types of devices being used, value of personal handheld devices use in the clinical, and

other issues that arose in the clinical setting. To provide an understanding of the participants' awareness in regards to the extent of personal device utilization in the clinical setting, the participants were asked if they had seen personal handheld devices being used in clinical. 60% (n=6) of the participants readily answered to seeing smartphones, such as Blackberry and iPhones predominantly being used than iPads/tablets in the clinical setting. Furthermore, 20% (n=2) of the participants observed the users of the handheld devices (iPads/tablets/laptops) in the clinical setting were mostly doctors. 30% (n=3) of the participants also mentioned that they assumed that some of these handheld devices that were observed being used by both nurses and doctors in the clinical settings were provided by their organization. Based on some of the participants' responses, both organizations were found to have the capability to provide devices, such as Blackberry devices, for staff if required by the job position, such as managerial or executive positions. Furthermore, there was one participant who observed nursing students utilizing handheld devices during their clinical practicum at their unit, the participant, however, was unable to confirm if it was a personal device or provided by the school. Lastly, there were 20% (n=2) of the participants who stated that they had not seen handheld devices being used in a clinical setting.

Graph 1 Participant Clinical Observation

To understand the NEx/MS' awareness of the utilization of personal handheld devices in the clinical setting by nursing staff, the participants were asked to comment on their observation of how the personal handheld devices were being used. 30% (n=3) of the participants observed that nursing staff appeared to be using the personal devices in a work related manner, and have no major issues that caused any neglect in professional responsibilities in the clinical setting. The following are sample quotes to support this concept:

Participant 3 described the use of personal devices:

“for the most part the staff are pretty good at knowing when to manage their iPhone or their personal devices use outside of when they are giving direct client care”.

Participant 9 similarly expressed:

“for the most part I find that the staff are using it appropriately. There has been a few incidences where specific individuals where I've had a conversation about appropriate use of it”.

When the participants were asked about their thoughts on the use of personal devices in the clinical setting, 50% (n=5) of the participants expressed initially some benefit but had followed their statement with some drawback with the use of personal devices in clinical. This was coded in the analysis as “I see the value, but...” To illustrate, participant 7 stated:

“I wouldn’t be opposed to it because I think that these devices do have a role. I think that they can really be useful for things that you’ve described for statistics or for managing information because you can store a lot of information in these devices. I’m thinking particularly of the iPad or the tablets. But I think we would have to be careful with the confidentiality aspect or the privacy aspect because it is work material that we are putting in a private tablet”

Similarly, Participant 1 stated:

“I think that they’re brilliant. From the bed management system, from any kind of communication among peers. You could have widespread grand rounds to this use of personal devices. I think there are a lot out that’s pointing to very positive but we have to weight that with patient confidentiality [...]”

Interestingly, only one participant expressed infection control issues with the use of these personal devices in the clinical setting due to multiple patient contacts in one day.

Participant 10 stated:

“ But there was the infection control issue so then they bring in a little plastic bag to cover it so that can [be] cleaned properly.”

In summary, the clinical use sub-category provided insight into participants’ knowledge of how these personal devices were being utilized, what devices were observed being used, and who were using the devices in the clinical setting. This sub-category provided the researcher an insight on how NEx/M make decisions and a preface

to what their acceptance standpoint were regarding the use of personal handheld device in the clinical setting.

4.2.1.2 Acceptance standpoint

Table 5 Theme 1 Management Perspective: Acceptance Standpoint

THEME	FINDINGS
Management Perspective	Acceptance standpoint
	Will not be accepted or happen

The acceptance sub-category described the NEx/M's standpoint on whether personal handheld devices were accepted in the workplace. This sub-category explored into the NEx/M views regarding the appropriateness of these personal devices within their department. Participant 4 described that integration of the personal handheld devices were inappropriate in the workplace for the reasons that the tablet/iPad applications were incompatible with the organization's applications and, therefore, will not be accepted in the clinical setting:

“It's never going to happen. I can't say that's going to happen for us. We chart on very specific application. That would be very difficult to be compatible on someone's iPad. I wouldn't want people to use their own iPad for something like that. It's not fair for them.”

30% (n=3) of the participants found the utilization of personal handheld devices in the workplace were not acceptable with the perception that these devices brought security risks to the organization. Participant 6 expressed concerns with private information being vulnerable with the use personal devices at the workplace:

“That is not acceptable at this stage for me. It potentially opens up a whole other vulnerability to obviously information sharing and sensitivities of information”

20% (n=2) of the participants expressed that there was a need for technology to advance within the organization in order for these personal devices to be an acceptable platform in the clinical setting. To illustrate, participant 3 conveyed their standpoint on personal devices in the workplace:

“[...] certainly there has been a desire for the access [with] the electronic information for the staff needs [to be] in a more manageable platform”

According to these study findings, 60% (n=6) of the participants did not accept the utilization of personal handheld devices for the reasons of incompatibilities between personal devices and organization applications, security risks, and the lack of organizational technology advancement to manage personal handheld devices in the clinical setting.

4.2.1.3 Professional Responsibility

Table 6 Theme 1 Management Perspective: Professional Responsibility

THEME	FINDINGS
Management Perspective	Professional responsibility
	<ul style="list-style-type: none"> a) To reliable accessible information b) To standard of care c) Continuous learning

Professional responsibility was the third sub-category under the management perspective theme. Professional responsibility included the perspective of the NEx/M on how the use of personal handheld devices in the workplace involved a considerable amount of responsibility to ensure a reliable source of information were available for the staff, maintain a level of safety for patients/clients, and the organization. There were three concepts of responsibilities that were identified and they were: a) responsibility to

provide reliable accessible information, b) professional responsibility towards the standard of care the patients are receiving, and c) responsibility for continuous learning.

Firstly, responsibility to provide reliable accessible information means ensuring the information was accessible for all the team, the information gathered was accurate, and information being accessed was trustworthy. Participant 7 expressed concern over reliable accessible information that was being gathered in the personal handheld devices and stated:

“So that would be my only concern that the tablet would only be used by one person and the leadership team may not have access to that. Are they statistics being gathered that in the same way or is the information being disseminated the same way?”

Three participants voiced their concerns about the standard of care the patients were receiving from the staff as it related to the use of personal devices at the point-of-care. The NEx/Ms’ professional responsibility, in this sense, took the form of their decision as to whether allowing people to bring their own personal handheld devices that could help support patient care. This concept is illustrated in the following quote from participant 1:

“I don’t think it’s impossible but I think we need to give it a lot of thought to ensure that we can support our patient in the best way possible even through technology.

Participant 6 also conveyed their concerns that there was a “need to maintain the professional responsibilities and accountabilities as best we can” regarding decision making with the use of these personal handheld devices in the workplace. Participant 3 conveyed their professional responsibility with respect to evolving the standards of care along with technology advancement in a safe and ethical method:

“And how do we ensure that we do that [and] we keep the information safe, that we’re acting ethically, and that we’re acting responsibly”

The third and final concept in this category was NEx/M professional responsibility for continuous learning. This concept involved continuous learning and education, both for the NEx/M and their staff, with respect to appropriately manage this new and continuously evolving phenomenon. As issues continuously unfold along the way, some NEx/M expressed that they were finding themselves learning how to manage this new phenomenon as it came. Participant 6 used the term “struggle” because the BYOD phenomenon evolved everyday and yet participant 1 stated the need “to support” the nursing staff in regards to their clinical needs. Lack of staff understanding about what was involved in the utilization of personal handheld devices in the workplace also drove the need for continuous learning among the nursing staff, as illustrated in the following quote from participant 3:

“I think it is a continuous learning because I think a lot of our staff don’t understand that email is a social network”

Participant 5 addressed the need for ongoing staff education:

“But we do have an opportunity here for some education so we’ll be moving forward with that over the next couple of weeks. The reason I mentioned that it’s just so fresh for me”

According to these study findings, the NEx/Ms’ professional responsibilities involved making decisions based on whether personal handheld devices improve and maintain: the patients’ quality standard of care, the staff clinical practice, and the organizational standards.

4.2.2 Opportunities

Opportunities were the second theme that emerged from the participants' interviews. This theme described the participant's views on the possible opportunities that a personal handheld device could bring into the clinical setting that could enhance nursing practice, patients' quality of care, and the organization's platform.

Table 7 Theme 2 Opportunities

THEME	FINDINGS
Opportunities	1) Move forward with technology 2) Convenience <ul style="list-style-type: none"> a) Being mobile b) Easy access to information c) Device familiarity 3) Interpersonal relationship <ul style="list-style-type: none"> a) Patient education b) Patient communication

Many of the participants were aware of the possibilities and opportunities that mobile technology can bring into the clinical setting at the point-of-care. Upon analysis, the participants' opportunity responses centered around three concepts: 1) moving forward with technology, 2) convenience (being mobile, information accessibility, device familiarity), and 3) interpersonal relationships. The first study finding that will be discussed under Theme 2 is moving forward with technology.

4.2.2.1 Moving Forward with Technology

The first sub-category under opportunities was moving forward with technology. This concept explored on the participants' viewpoints on how they saw personal handheld devices could move the healthcare organization to advance technology to what was available for consumers.

Table 8 Theme 2 Opportunities: Move Forward with Technology

THEME	FINDINGS
Opportunities	Move forward with technology

When the participants were asked to comment on the evolution of using personal devices at the work place, participants expressed their thoughts in two primarily different ways. First, the participants discussed the opportunity to move forward as technology advances using terms such as “move’ or “moving”. To illustrate, participant 8 discussed their thoughts about healthcare organization moving forward with the technology advancement that are available for the consumers:

“Again, I don’t think we’ll be too far away before we see most areas having access to it. Fact of the matter is, the world is moving down in that direction. I can’t remember what the statistics was, but it’s not that far away that the majority of people will no longer have desktop computers or laptops. And they will do the majority of all their electronic work off their cellphone. So that is the future, it makes sense for us to move in that model [...]”

Participant 9 also conveyed the need to move forward with the world of technology advancement that was readily available for the consumers:

“Once again we need to look at the way the world is moving in terms of portability and picture taking”

Secondly, participant 9 used a different term that conveyed the same concept with regards to healthcare organizations to “move forward” by using the terms “catching up” and “keeping up” with the technology advancement that were available for the consumers.

“I think that we as a health authority need to catch with the times. So I think that, right now, peoples’ mobile devices are filling a gap to which that we are not mobile at all in the department. And moving into the future, if we catch up and have the ability for mobile devices in the unit and some of the benefits that I’m seeing of them could be incorporated in that. [...] It’s [a] difficult place to be because I don’t know if we can necessary keep up in the health authority with the way technology is going, the movement of technology. Where as individuals may be able to keep up with that, easier on their own personal devices.”

According to these study findings, the participants were very much aware of the opportunities handheld devices could bring into the clinical setting, such as the possibilities for enhancing nursing clinical practice. Consequently, some of the participants expressed a need for BC healthcare organizations that have fallen behind to “move forward” or “keep up” with the technology advancement that were available for consumers.

4.2.2.2 Convenience

Convenience was the second sub-category under the theme opportunities. This sub-category described the participants’ views on the opportunities for convenience that the personal mobile device could bring into the clinical setting. By definition convenience is a situation that makes something easy or useful for someone by reducing the amount of work or time required to do something; and includes things, such as a device, that makes you more comfortable or allows you to do things more easily (Merriam-Webster Dictionary).

Table 9 Theme 2 Opportunities: Convenience

THEME	FINDINGS
Opportunities	Convenience
	a) Being mobile b) Easy access to information c) Device familiarity

There were three concepts that emerged under convenience: a) mobility, b) information accessibility, and c) personal device familiarity. These three concepts were linked together that suggested a personal handheld device will often be carried (mobility) and used (familiarity) by the nursing staff and, therefore, can access information at

anywhere and anytime (information accessibility). Half of the participants noted the opportunity of mobility with these handheld devices and the following were quotes that supported this concept:

Participant 3 noted the opportunity of mobile information specifically for nurse executives:

“So I use my iPad for work that I can connect into the Vancouver Coastal Health network when I’m at meetings and that I don’t have to carry papers around and I have access to the network when I’m either out in the community and at meetings throughout the Vancouver Coastal Health.”

Participant 8 then expressed their thoughts on the opportunity a mobile technology can bring to clinicians:

“where the clinicians have the information and the technology that they need to do their job with them at all times. It makes sense from a patient continuity and patient safety and in a quality perspective that we would just have our clinicians carrying everything that they need with them all the time.”

Another participant further commented on how personal mobile devices have the opportunity to provide continuity of care in the community through being mobile.

Participant 5 envisioned the possibility of how mobile devices could reduce duplication in the workplace.

“How do we look at or manage the workflow [is] paying attention to the reduction to duplication as we work thru this hybrid world. So we pay attention to that, we pay attention to the number of times that we’re asking patient the same information. So reducing the times that the question is asked the same patient. [...] What I would love to see is a system that is provincial so that we could move people around within our health authority. Even for the physicians to be on the same system for full community care and acute care, prevention, mental health and addiction, everybody to be on the same system. [...] The information that is relevant for the patient that is available to everyone easily.”

Three participants proposed a different feature of mobility where a time saving aspect of the personal handheld devices could reduce the amount of steps it could take to look for

information. The following was one of the quotes from participant 5 that supported this concept:

“[...]quite a time saver for them not to have [to] write things down and go back out to the desk to input them. For a mobile device actually more friendly to the work than a stationary device.”

The other opportunity of convenience that emerged from the participants was accessibility to current and relevant information to help improve patient care at the point-of-care. Participant 1 conveyed the opportunity in having a wealth of knowledge to help improve care:

“The reason I say that because there’s just a wealth of knowledge and information and research. That would help us with managing best practice. The other piece is pharmaceutical; this drug interacts with this. There is a certain app that we can get on our smartphone that can help with decision-making.”

Additionally, 20% (n=2) of the participants suggested that using one mobile device that users were familiar and prefer were perceived to be desirable at the workplace for highly mobile staff members. The association was acknowledged between convenience of familiarity and mobility in the use of one’s own device that was frequently used, thus provided a seamlessly easy access to information at the point-of-care, therefore, building efficiency and productivity in the workplace. Participant 9 commented on the familiarity of personal devices:

“Positive in that it was portable for staff members. That they were able to look things up in the tool that they have use more frequently so its easier to navigate in some regards. So when they have applications on their phone it’s something that they are using frequently and it can be easier to navigate than looking on the intranet of the site specifically.”

The study findings regarding the opportunity for convenience revolved around the convenience of mobility, familiarity, and easy access to information. The participants found that these conveniences provided opportunities of continuity of patient care, efficiency, and productivity to a highly mobile staff.

4.2.2.3 Interpersonal Relationships

This final sub-category under opportunities described the participants' views on the opportunity the personal handheld device could bring towards developing interpersonal relationship during patient education and during patient communication.

Table 10 Theme 2 Opportunities: Interpersonal Relationships

THEME	FINDINGS
Opportunities	Interpersonal relationship
	a) During patient education b) Patient communication

30% (n=3) of the participants expressed how personal handheld devices were able to connect healthcare professionals with patients through education using personal handheld devices in the workplace. Participant 9 commented on seeing a personal mobile device being used in the clinical setting as a teaching tool:

“So I’ve actually seen a staff member using it to explain to a patient a little bit more about what they’ve been told about what’s going on for them. So I think that was positive, it was using [it] as a teaching tool for them. It was something that they were able to bring to the bedside and show the patient there rather than having it at the computer.... The patients are able to go to the website they were using and have it themselves on the their phone. It was providing them with some extensive discharge teaching by giving them another resource to go to.”

Participant 1 described how a mobile device allows physicians to distinctly illustrate and communicate the condition of a patient at the bedside. This opportunity could have an impact to the level of understanding the patients have in regards to their own condition:

“I’ve seen physicians take the iPads into the patient room and show the patient the x-ray on the iPads and describe what that patient’s issue was with the x-ray right in front of them. And so it was much [easier] to describe to the patient when the patient has a picture to look at as well as verbal explanation.”

Patient communication was the second part under interpersonal relationship sub-category. 30% (n=3) of the participants have suggested that there was an opportunity to connect with patients using personal handheld devices in the workplace for communicating with patients. Participant 3 suggested considering the patients’ desires for electronic base information and the selection of appropriate modes of communication to relay health information.

“[...]looking at what our client and our patients want from us in regards to communication...that is how our clients are requesting this. They connect with health now is not by telephone but either through texting or email.”

Participants 1 also noted there were limitations to this communication mode.

“Let’s face it, the younger the patients are, I could foresee a 24 year old, thinking it would make sense for her getting a BBM from her physician of her test results. But you’re not going for an 80 year old isn’t going to accept that way of communication. It’s about getting the right type of communication with the right patient cohort.”

According to the participants, using a mobile technology provided an opportunity to help increase the patients’ level of understanding in regards to the patients’ own conditions by receiving information from the healthcare professionals in a clear and personalized way through electronic education and communication.

4.2.3 Disadvantages

The third theme that emerged from the participants' responses was disadvantages. This theme involved the participants' perceived disadvantages that were associated with the utilization of personal handheld devices in the workplace. The disadvantages theme can be broken down into two sub-categories: disadvantage with patients and disadvantage with nursing staff.

4.2.3.1 Disadvantages with Patients

Table 11 Theme 3 Disadvantages: With the Patients

THEME	FINDINGS
Disadvantages	With the patients
	1) Loss of privacy and security a) Loss of device 2) Loss of quality in patient care a) Loss of human contact b) Potential for errors c) Information trustworthiness

The first perceived disadvantage with patients included the participants' concerns with: 1) loss of privacy and security and 2) loss of quality in patient care. Firstly, 60% (n=6) of the participants conveyed, in general, a disadvantage to patients because of perceived risks with privacy and security. All participants cited issues in regards to the idea of storing patient identifiers in the personal handheld devices as a risk of breaching confidentiality (Graph 2: Privacy and Security Concerns). Participant 6 commented on the risk of privacy breach:

“We know that in a more technological era the risk of privacy breaches or lack of confidential information remaining confidential need to be taken more seriously than ever, in my opinion.”

Participant 1 noted the lack of change with the policy:

“What I find really difficult was our patient confidentiality policy has not evolved enough to include work around iPads.”

20% (n=2) of the participants questioned the security quality within these personal handheld devices and how it compares with organization’s security standards and the lack of verification of following organizational standards. Participant 5 stated their security concerns:

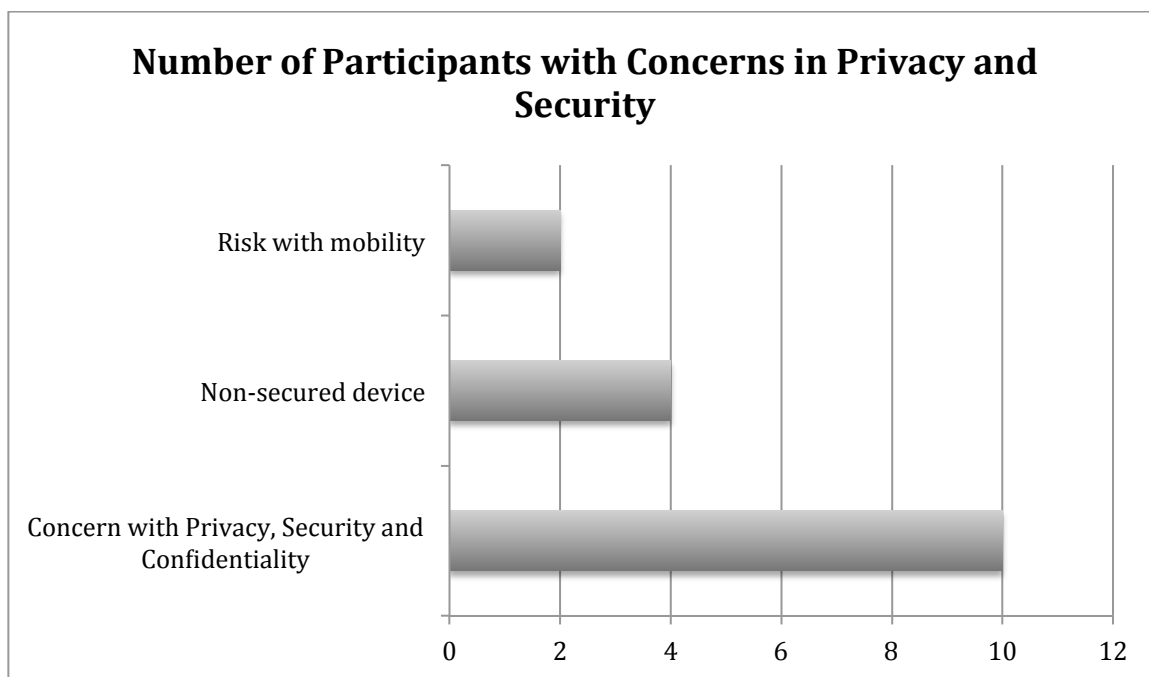
“I think that is a concern because as much security as one have, there is always the ability to hack. And that is always a concern, and that is a concern on so many levels with any sort of electronic information.”

Participant 9 focused on the lack of verification of security as an additional concern beyond known security threats:

“Concerns that are related to any sort of patient information that can be put on there, using those for any patient information. Like I said before, the security aspect of it is not a secure network like the health authority would have set up. There [are] definitely concerns around that matter. But like I said before, there is no way of checking up on that.”

Some have suggested that the primary advantage of mobility could also be considered a security disadvantage with personal handheld devices. The disadvantage was considered because of the risk of personal information leaving the organization premises as the device can be carried outside the workplace and can also further increase the risk for lost or theft. The following quote was from participant 10 that supported this issue of mobility as a security risk:

“Then the other one is when it’s portable, you can lose it, and not just the device but you are losing a lot of the patient information. So the patient confidentiality is a huge one.”

Graph 2 Privacy and Security Concerns

Some of the participants had expressed concerns about how the use of personal handheld devices in the clinical setting could diminish the quality of patient care. Distractions were the leading concern by 40% (n=4) of the participants regarding personal handheld devices in the clinical setting. Participant 1 expressed their concern with loss of patient care:

“The biggest disadvantage is lost time with patient care. The distraction that the personal devices cause amongst the staff, so the patients are getting less care because [the] staff are distracted either by social media or something. [...] You have the propensity for error. So it’s the interruption and distraction that we need to figure out.”

Participant 10 was concerned that distractions could cause a loss of human contact or personal contact and potential for error:

“So one important piece of healthcare is face-to-face engagement, emotional intelligence, empathy with the journey that patient is on. I don’t think it’s

impossible but I think we need to give it a lot of thought to ensure that we can support our patient in the best way possible even through technology.”

Information trustworthiness was also part of loss of quality of patient care. This concept was regarding the use of non-peered reviewed resources that were easily accessed by nursing staff from outside the organization-approved sites. The NEx/Ms’ expressed a professional responsibility to provide reliable information to ensure a safe environment for both staff and patients. The disadvantage aspect was explained by participant 9 who was particularly concerned about the source of information the staff were accessing using their personal devices that may potentially have an effect on the quality of patient care:

“Sort of negative aspects of it is that it’s hard to control the source of information, right? So what site they are going to, is that reputable information or not, is it stuff that is condone by the health authority? I don’t know. I think that is an area of concern for me.”

The majority of the participants notably voiced concerns about the potential risks associated with BYOD to the quality of patient care, privacy and security. The disadvantages towards the patients were noted to have the most negative responses from the participants regarding BYOD in the workplace.

4.2.3.2 Disadvantages for the Nursing Staff

Table 12 Theme 3 Disadvantages: For the Nursing Staff

THEME	FINDINGS
Disadvantages	For the nursing staff
	1) Decrease productivity <ul style="list-style-type: none"> a) Interruptions and distractions b) Inappropriate use 2) Negative Reflection on professional practice <ul style="list-style-type: none"> 3) Incomprehension consequences

Participants identified that there were a number of disadvantages associated with BYOD for nursing staff. NEx/M identified these disadvantages for the nursing staff to be: 1) decreased productivity, 2) negative reflection on professional practice, and c) incomprehension of consequences. Firstly, the participants suggested that personal handheld devices could decrease productivity in the workplace. This concept included inappropriate usage, interruptions, and distractions arising from the use of these personal devices in the workplace. 60% (n=6) of the participants expressed concerns that personal handheld devices bring a factor of distractibility, such as logging onto personal emails and social media while in the clinical setting that could affect the quality of patient care. The participants suggested that with personal devices come personal applications, personal contacts, and personal communications that can consequently cause inappropriate use of the device in the workplace. Participant 1 expresses this concern with inappropriate use of time in the following quote:

“And I hear nurses all the time: we’re so busy, we need more staff, we’re short staff. And yet when I walk around the corner there [are] three people sitting at the nursing station all with their phones out looking at Facebook, texting family members, basically, on the social media.”

50% (n=5) of the participants have commented on the interruptions (texts and emails) and distractions (games and social media) that occur during work with personal handheld devices from smartphones to tablets and iPads. To illustrate, participant 7 commented on the distractions with personal devices:

“Because you can bring your personal device and say, it’s only for work. But if it’s a personal device and you are a game player and you’ve got your games on there, you know what’s going to happen. It’s the lure of Angry Birds or

Candy Crush. It think it's coming. I don't think we can do anything about that but we'll be fighting human nature.”

Additionally, participant 3 suggested that it could be difficult to separate personal from professional use during professional work hours

“Truly to be really simple with it the only disadvantage that I see is that personnel, staff and physicians are taking a not intentional about their professional duties during work time. That personal time creeping into the work time.”

The second concept under perceived disadvantages for the nursing staff was regarding negative reflection on professional practice. The participants were concerned that nurses using the devices in the clinical setting could be observed by others, such as patients and families, as using personal handheld devices for non-related work and being utilized for personal activities instead of providing nursing care. The following is a sample quote from participant 8 who commented on the perceptions of other people:

“The one that is the most interesting concern to me is of the patient. As a society we have not come to terms with what it is that is ok and not ok with regards to cellphone etiquette in the healthcare setting, is the prime example. To anyone who is observing, you could be doing anything on your cellphone, no just looking at the dosage of whatever, drug. I have received complaints about staff being on their cellphones and patients needing attention. The perception that staff are not doing anything other than playing on their cellphones. [...] Cause in the eyes of the person who's observing it, that's all that matters. And in the service that we are in, industry such as healthcare, we must be mindful of that.”

Finally, the last concept was the lack of awareness or incomprehension of consequences regarding actions that may be lead to inappropriate utilization of personal handheld devices in the workplace. There were actions that may be considered normal outside of the organization, but may not be acceptable inside in a workplace without the risk of breaching privacy or confidentiality of patient information occurring. 30% (n=3)

of the participants expressed concerns about photos taken within the organization. Participants noted that staff appeared to have a lack of awareness of what is being included in the photo, such as confidential information in the surrounding area. 50% (n=5) of the participants conveyed their concerns regarding the lack of awareness of the consequences of the staffs' actions in this matter. Participant 1 explained their concerns regarding photos taken within the organization:

“The staff took a picture of the nurse with the cake, but behind the nurse in the picture is the white board with all of the patient information on it. So that picture was posted on Facebook. And so the patient information of the patients that were in the department that day was then posted on Facebook. Again there was no mal intent. [...] but there was breach in confidentiality because the pictures was then posted on Facebook and the names were visible.”

According to the participants' responses, the disadvantages to the staff with using personal handheld devices in the clinical setting were all associated with negative effects towards the nursing practice. These negative effects were found by the participants to be associated with decreased productivity due to distractions, negative perception of others, or the staff's lack of understanding of inappropriate utilization of such devices. Even as the participants noted these disadvantages of using these devices, they also identified solutions to these concerns (as will be outlined in the next section).

4.2.4 Solutions

Table 13 Theme 4 Solutions

THEME	FINDINGS
Solutions	1) Staff communication and education 2) Set clear guidelines 3) Information storage solutions 4) Organizations to provide the tools and resources

Solutions were the final theme that emerged from the NEx/M responses. This theme involved the participants' outlining solutions to disadvantages associated with using personal handheld devices in the clinical setting (outlined earlier in this chapter). Four types of solutions were noted by participants, including: 1) staff communication and education, 2) setting clear guidelines about usage, 3) information storage solutions, and 4) organizations to provide the tools and resources. Firstly, 90% (n=9) of the participants suggested there is a need to conduct continuous staff communication and education about addressing current issues associated with BYOD and to review boundaries in relation to general electronics use in the workplace. For instance, participant 6 explained what their processes were for communication:

“When I see that it’s obviously inappropriate, I do frequently talk to the employees about that and send out reminders about it as well. If I notice it’s sort of cropping up in themes then I, certainly, send out email reminders of expectations and on policy and procedures in that sort of thing, as well.”

Secondly, 60% (n=6) of the participants proposed setting written clear expectations, guidelines and boundaries in regards to the use of personal handheld devices in the workplace. This was coded all together using the exact terms of “expectations”, “guidelines”, and “boundaries” and ideas surrounding it. Some participants were found to provide more specific guidelines solutions while others’ comments were more in general terms in regards to the need to set clear guidelines in their unit. Participant 1 explained what their solutions for communication in the workplace are:

“I did work with the managers we set up expectations of staff behaviours. We wrote it out. Because not all staff were partaking are using their devices at work. In a unionized environment, you can’t single people out. In a

unionized environment, we sent a message to all the staff saying it's an expectation that you use your personal devices on your break only and to not bring them into the patient care area. So that they stay in your locker while you are caring for patient and when you are in your break you can use your personal devices. [...] I set out guidelines of the expectations.”

Similarly, participant 8 explained how they communicate their expectations to staff:

“To address it there are a couple of things I do ongoing and a couple of things that I do in the moment. So on going is a part of every new staff members who join our team regardless their discipline, except with medicine. I don't do this with physicians. So staff who directly report to me, I sit down and have a conversation with them. One of the things we review is cellphone usage, or and what is and is not appropriate with regards to technology usage, in fact. So usage of the computers or telephones in the ED. So it's one thing that happens routinely for all new staff. And then during one-on-one conversation if there is something that needs to be addressed, like performance review. I'll bring it up there and set clear expectations with the individuals who don't follow the rules at work.”

There were two ways that participants disclosed to their staff what the expected utilization of personal devices in the workplace were: 1) continuous communication and education regarding concerns with nursing practice; 2) written expectations in the workplace and distribution of communication reminders to the staff. As participant 8 suggested that these expectations and guidelines communications and education should be done in the beginning at orientation and during performance reviews that would allow managers to have a personal conversation with individual staff.

The third solution that emerged during the participants' interviews was information storage solutions. All participants were against storing any patient identifiers on personal handheld devices. 70% (n=7) of the participants suggested solutions for information management regarding the data being stored in these personal handheld

devices. Participant 2's suggested solution was storing sensitive information on a different hard drive that should remain on the premises of the organization:

“They can use it but they have to save it in the drive that is for work purpose project. Then they should save it in the drive, one of those portable drives and that should be work related. They can use it, it's a device, it is just a vehicle of getting the information. But the files and the information should belong to the hospital if that is a hospital project. So there should a be a place for them to store their files and work. The device is a vehicle to get work done. So yes they can do it, but the file should be returned and not be saved in their own personal drive rather in the hospital hard drive or the stick.

Two participants suggested limiting the use of personal devices to clinical research only, without the use of patient information. Participant 5 expressed their thoughts about the exclusion of patient identifiers:

“It would have to be theoretical clinical work. It couldn't be any sort of identifiable work that it's identifiable by patient's name, MRN, or anything like that.”

Participant 9 conveyed their support for the use of personal devices as resource information:

“It's not appropriate to have any sort of personal patient related information by a personal phone. It's different to look up references, to look up medical information compared to, obviously, can't have anything patient related on there.

Two participants suggested ways in which personal devices could be used in the clinical setting to gather data to support patient care but without patient identifiers. To illustrate, participant 9 commented on the appropriate use of personal devices in the workplace:

“So if it's something containing confidential personal information from any clients and for any patients then I don't condone that. That's not something that is appropriate. I think it needs to stay in the secure network of the health authority. It depends what it is they are doing. So if they are looking at something such as looking at what supplies should be kept in the trauma room and it's nothing to do with patients. Then it easier for them to bring

their iPad and do that then that is appropriate to do because of the portability of it.”

Lastly, 80% (n=8) of the participants suggested that the most ideal and effective solution type was to have the organization provide the tools and resources for work. This concept was centered on the idea that the devices that were available in the organization should also progress along with technology advancement to provide the tools and resources for the staff and to help maintain information security. Participant 6 noted that providing the devices would eliminate the need for staff to use personal devices.

“Well I guess, my hope is that as technology evolves then so will the resources and technology that we supply the leaders with. I don’t know why somebody would have to use their personal devices when an organization such as ours is fully equipped and able to provide them with similar resources.”

The first two solutions that emerged from the participants were regarding guidelines and expectation communication and education of the appropriate utilization of the personal devices in the workplace. The last two solutions were regarding the tools and resources that were available for the staff to allow them to perform efficiently at work and at the same time maintain information security.

4.3 Research Question 2: What Elements Do Nurse Executives Believe A BYOD Policy Should Include?

The participants were asked to comment on what should be included in the elements of a policy. Four elements of a policy emerged from the participants’ responses including guidelines for: 1) clinical use, 2) video, audio and photography, 3) privacy and security, and 4) management and potential disciplinary actions (Table 14: Element of BYOD Policy). The majority of the participants suggested a policy on guidelines about

how the personal handheld devices should be used in the clinical setting. Within these guidelines, some of the participants have suggested including boundaries and expectations of use. To illustrate, participant 7 commented on establishing clear guidelines:

“What it would be used for during off break times, so you are on the floor and working. So I think I would really have to be made really clear that if you’re pulling out your personal device for use at work when you are not on the break that it’s for work purposes only.”

Table 14 Research Question 2 Themes: Elements of BYOD Policy

THEME – ELEMENTS OF BYOD POLICY
Findings
• Establishing guidelines for clinical use
• Video, Audio, and Photography Policy
• Privacy, Security, and Confidentiality Policy
• Management and Disciplinary Policy

Additionally, less than half of the participants suggested including elements regarding video, audio, and photography in the guidelines. The policy should reflect and evolve to accommodate new technology advancements that would allow users to record video, audio, and take photography with ease and readiness to maintain privacy and confidentiality. The participants described this as the acceptable use of the recording function of these personal devices in the clinical setting. Participant 1 commented on including a policy with using the recording feature of the handheld devices:

“I think we need to include audible confidentiality, written confidentiality, and visual pictures. I think all of those should be included in the policy. Up until now it is mainly about written and not talking in an elevator but people can take things. Take conversation with their iPhone, they can take pictures with their iPhone, they can take video. All of those have to be included in the policy with guidelines on how to manage it and police it. It’s about having the policy in place and how do you police that policy.”

Privacy and security elements were the third element that was suggested by the participants. As previously mentioned, all the participants expressed concerns regarding privacy and security with these personal handheld devices. Interestingly, when the participants were directly asked about policy around personal handheld devices, only half of the participants commented on this matter while the rest of the participants generally mentioned the inclusion of privacy and security elements. For example, participant 2 stated the following general statement regarding privacy, security, and confidentiality element:

“Again privacy and confidentiality and having guidelines on what is the acceptable information.”

Other participants provided more specific suggestions on what parts of privacy and security measures should be included in this element. Participant 5 suggested a security measure with tracking:

“There probably should be some threshold of a way to be able to sign in and tracking within the program. Who’s been in, and who hasn’t, and what time.”

Participant 3 suggested more specific steps to follow for maintaining security:

“[...] the standard is don’t leave an electronic device unattended, if not have it locked in a box in the trunk. Making sure things, always have it encrypted. If you have a D or and F drive with you, making sure your removable stick is encrypted, those kinds of standards.”

Finally, participant 8 had more specific questions regarding software security and social media:

“How do you maintain security of sensitive information on a personal device? Reminders of confidentiality. Importance that technology is 100% traceable that nothing you do is that anonymous anymore. It’s software dependent, it’s a software issue not necessarily a hardware issue – that the hardware

facilitates access to social media? How we safely and appropriately use social media in a clinical environment.”

Lastly, the final policy element that was suggested by the participants was regarding management. Some of the participants described this element as including user management that also involved utilization management and disciplinary management that deal with inappropriate use of the personal handheld devices. Participant 2 commented regarding management of device usage by asking appropriate questions:

“[...] who are the users, what is the purpose, what’s the expectation, is there any guidelines, and the security level and does it meet the hospital policy and procedure.”

Participant 1 suggested asking users appropriate questions for using personal devices at the workplace:

“I’d had to have a conversation with them about what the advantage would be. What is the advantage for patient care for you to have your device with you, how is that going to benefit patient care? So I want to know what the enhancement was to the patient not for the staff member, but to the patient.”

Participant 4 suggested with management concept should also include disciplinary action:

“Again, it goes back to the guidelines and policy of the employer. And if there [are] people who are not using that, that is ground for discipline or a letter, whoever the people report to, the manager the people report to.”

Interestingly, during the interview, one participant found a copy of a policy for personally owned devices that was available in their health authority. The participant had shared some of the concepts that were included in the policy during the interview. The participant noted that this policy was available for all employees who have an email domain or account within the health authority and noted that this policy was not well

known to every employee. The following is an excerpt of what was included in this policy as provided by participant 3:

“Support agreement for personally owned iPhone and blackberry. [...] any request to connect one must be approved with the appropriate administrative authority. So you have to have a purpose. [...] And so they said that we don't get hardware and software support, so we are sort of on our own. And the security policy is that a security policy will be pushed out to the device during set up to enforce the encryption in that of locking the password protection. So that if there is a problem they can quickly delete it all. So my responsibility, here is what I signed for. It's my responsibility to safely secure my device that I have to report lost or theft immediately to the IMIT service desk to disable and wipe out the sensitive material. It's my responsibility to be observant of the [...] guideline for cellular use. And camera use of any photography or staff or patient without their expressed consent is prohibited.”

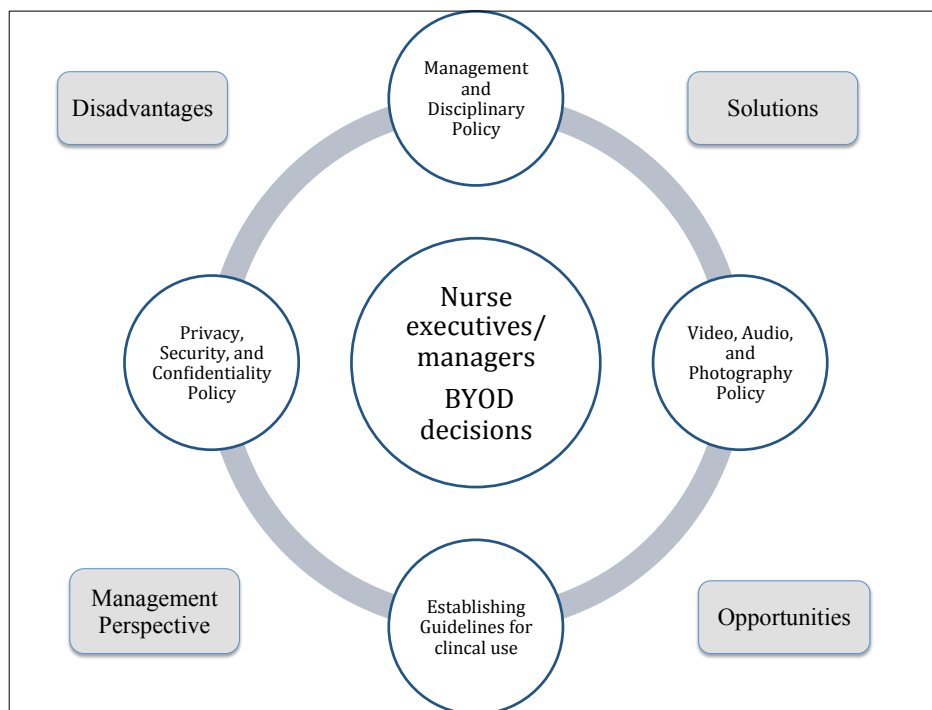
In summary, this policy included the type of device to be supported, providing and receiving approval from administration, addressed the type of hardware and software support that will be provided, security measures (encryption and password protection), remote complete information wipe out of the device in case of lost/theft, user responsibilities, and other guidelines of use in the clinical setting.

4.4 Summary of Qualitative Findings

To summarize the research findings that emerged from the participants' responses on how NEx/Ms' make decisions in regards to BYOD were based on: 1) the management perspective, 2) opportunities, 3) disadvantages, and 4) solutions. The NEx/M's management perspective was based on the clinical utilization of personal handheld devices and their professional responsibilities towards the patients, staff, and the organization. Further, the NEx/M's decision making was also influenced by opportunities of technology advancement within the organization along with other opportunities of convenience, timesaving, and development of interpersonal relationship with the patients

or clients. However, these opportunities don't come without risks and disadvantages in the clinical setting. The risks and disadvantages that affect patient information privacy and confidentiality and quality of patient care were found to influence the NEx/Ms' decision making. Further, the perceived disadvantages where the nursing staff are concerned in relation to decreased productivity, negative reflection, and incomprehension of consequences may also influence the participants' decision making. In relation to the risks and disadvantages, the participants suggested solutions about how to manage this phenomenon appropriately and safely. Setting clear guidelines was one particular solution that NEx/Ms factored into the elements of a BYOD policy that included other elements of: management and disciplinary policy; inclusion of video, audio, and photography policy; and privacy, security, and confidentiality policy. The participants' concerns in relation to management perspectives, the opportunities, disadvantages, and solutions of BYOD were posited into the elements of the policy as they overall influence how NEx/M make decision regarding the BYOD in the workplace (Figure 1 BYOD Theme Relationship).

Figure 1 BYOD Theme Relationship



Chapter 5 Discussion and Conclusion

The purpose of the research was to generate an understanding of how nurse executives/managers (NEx/M) make decisions regarding BYOD by exploring their experiences, views, and perceptions of personal handheld devices in the workplace. The researcher administered a demographic questionnaire and conducted interviews with ten NEx/M participants. The interview was focused on utilization of personal handheld devices, such as tablets and iPads in the clinical setting. Eight open-ended questions were used to elicit rich details from the NEx/M's experiences. An iterative process of data analysis was used to develop themes from the participants' responses. A qualitative descriptive study was used for this study.

This research was informed by a literature review to have a better understanding of both the individual and organizational level impacts on how NEx/M make decisions regarding BYOD. This was particularly essential for administrators and health informatics professionals when designing strategies to improve the work environment and educational practices of the employees. Acknowledging the NEx/Ms' perceptions regarding the use of personal devices in the workplace was one of the first steps to make better clinical decisions regarding this phenomenon. Therefore, the objective of this study was to learn about how nursing executives were making decisions to address BYOD among nursing staff. Therefore, the goal of this chapter was to discuss the study findings in the context of the current research and answer the following questions:

1. How do nurse executives make decisions regarding BYOD?
2. What elements do nurse executives believe a BYOD policy should include?

5.1 Nurse Executives and Managers Make Decisions Regarding BYOD

As identified in the literature, there was a lack of research information in regards to BYOD as it relates to nursing staff. However, during the literature review process, there were similar research studies previously done in the early 2000s regarding healthcare organizational concerns with personal digital assistant devices (PDA) in the clinical setting. In this study, four major themes emerged that provided the researcher with insights as to how nurse NEx/M make decisions regarding BYOD, the four major themes included: 1) the management perspective, 2) opportunities, 3) disadvantages, and 4) solutions.

5.1.1 Management Perspective

Management perspective was the first theme that emerged and captured the participants' perspective on BYOD and how it impacted their roles and their responsibilities towards their staff, patient populations, and the organization. The NEx/Ms' perspective on how much value BYOD adoption could bring into the clinical setting, whether it could add value or act as more of a barrier towards nursing practice and quality of patient care. The NEx/M perspective on how much technology could add value to the clinical setting was similar to the early literature from both the early studies with PDA (Mendonça et al., 2004; Sharman, 2007) and recent studies with BYOD (Horng et al., 2012; Wu et al., 2011).

For example, in a 2005 study done by Kushniruk et al., where technology induced errors and usability were studied, the researchers found that handheld devices have a potential role in streamlining procedural aspects of healthcare, however, issues related to the design of applications needs to be addressed first to ensure their use does not increase

the potential for medical error (Kushniruk et al., 2005). This was similar to a recent study, where perceived usefulness has a much greater influence on attitude toward using mobile technology than perceived ease of use (Wu et al., 2011). Determining how technology adoption could be used and whether it would help or hinder care was a theme in this study and prior work. With technology adoption in the clinical setting, the NEx/Ms, as leaders have the responsibility to guarantee the quality of patient care. Along with that responsibility, as decision makers, NEx/M need to envision the opportunities technology can bring into the clinical practice.

5.1.2 Opportunities

The opportunities of enhancing best practice at the point-of-care was the second theme that emerged from the NEx/Ms. The principle idea behind this theme was to bring the possible benefits and opportunities of a technology in the clinical setting to enhance nursing practice and help improve the quality of patient care. The opportunity to improve and move forward with technology development had been discussed quite similarly in the studies with early PDA devices and more recently BYOD devices. The opportunities with PDAs allowed healthcare professionals access to a vast amount of current and relevant information from a compact portable device (Krauskopf & Wyatt, 2006; Tooley & Mayo, 2003). This was also supported by the studies found with BYOD devices, where personal mobile devices had the benefit of a full computer interface with ability to access the internet and store useful application at the point-of-care and yet small enough to fit in a pocket (Astani et al., 2012; Harple et al., 2013). Furthermore, the mobility aspect of these personal devices adds to the convenience and time saving factor with the use of these personal handheld devices in the clinical practice.

The opportunity for convenience and saving time associated with personal mobile technology have been discussed early on in the literature back when the early PDAs first came into the healthcare setting. It had been determined in the literature review from Chapter 2 the first similarities found between PDA and BYOD was mobility and convenience. In early studies of PDA, it was identified that due to the mobile nature of the profession of nurses and physicians, the convenience of mobility and real-time access to information saved time and enhanced productivity and quality of patient care (Ammenworth et al., 2000, Lu et al., 2005). Similarly, researchers found in a more recent study, that the mobility and convenience factor of BYOD was one of the main reasons why healthcare professionals prefer the use of their own personal devices into their everyday personal and professional routine (Boisvert, 2012, Malkary, 2012).

The opportunity to improve interpersonal relationships through connecting healthcare professionals with patients through education and electronic communication from using personal handheld devices in the workplace were not found in the literature but expressed by some participants as an opportunity. For example, mobile devices allow healthcare professionals to distinctly illustrate and communicate the condition of a patient at the bedside. There were a multitude of benefits associated with BYOD initiatives that nurse executives could bring into clinical practice, however, security was considered a huge disadvantage for most of the NEx/M.

5.1.3 Disadvantages

The fourth theme that emerged from the study results was regarding the disadvantages that BYOD could bring into the clinical setting and how these disadvantages could affect the nursing practice and the quality of patient care. Loss of

privacy and security was one of the main concerns with personal handheld device that was identified from the participants that had been comprehensively discussed in the literature, even in the early studies with PDAs. Privacy and security was thoroughly studied in the literature with an extensive range of discussions concerning wireless technology and compliance with HIPAA/FIPPA for PDA (Courtney et al., 2005; Mendonça et al., 2004; Tooley and Mayo, 2003) and with the current technologies of BYOD (Bourque & Bentfield, 2012; Moyer, 2013; Ponemon, 2012). Therefore, how the NEx/M make decisions was influenced by FIPPA compliance as it relates to the collection, access, use, disclosure, retention and overall protection of personal health information (Canada Health Infoway, 2010).

Much of the concerns of NEx/Ms were in and around maintaining the patient's privacy, as well as, communicating this concern to their nursing staff. For instance, the storage of patient information in these personal mobile devices was not acceptable for most of the NEx/M due to mixing of professional-personal data in one device and the mobile nature of the device. This concern was also found in the early literature with PDAs when considering the theft of personal devices (Berglund, 2007; Tooley and Mayo, 2003). Conversely, the BYOD literature had an extensive array of research associated with the term data breach as it relates to storing personal information in the device, photography, social media site access, and accessing the organization and other unsecured networks (Astani et al., 2013; Boisvert, 2012; He, 2013; Moyer, 2013; Suby, 2013). Newer BYOD devices have more capabilities, were more powerful, and had the ability to multi-task between different applications; therefore, the risks to privacy and security were also more extensive. One may take into account that the NEx/M's prior

experience in regards to personal handheld devices may have a factor into the participant's responses towards their perception of the disadvantage with BYOD. For example, consider a participant who's had a negative experience with personal handheld device in the clinical setting could have a biased negative attitude already prior to the interview and would influence their responses to the questions.

At this point in the discussion, most of the dialogues about how NEx/M were focused on decisions regarding BYOD and were concerned with the effects of BYOD to nursing practice and quality of patient care. Therefore, the other disadvantage that emerged was related to the perceived decreases in productivity and loss of quality of patient care with the use of BYOD in the clinical setting. The distractions that personal handheld devices bring into the clinical setting were the most concerning because the participants perceive the distractions disrupt care and diminish the quality of patient care. The articles for BYOD supported the NEx/Ms' concerns about the disruptions (games and social media) (Delloite LLP, 2009; Harmon.ie, 2011; Suby, 2013), interruptions (texts and emails) (Suby, 2013) that these personal devices bring into the workplace that could result in a decrease in productivity or medical errors. These types of distractions were all new and specific to BYOD devices due to the array of available applications (apps), including apps that were meant to entertain. However, there was one study that was done in 2008, that suggested a distractibility factor with the use of PDAs in the clinical setting, where the study found the top two functions of PDAs, other than the essential assessment documents, used by nursing students were the diary and the game functions (Dearnley et al., 2008).

The disadvantages of nursing staff accessing non-peered reviewed information

were not found in the literature. The NEx/M expressed a professional responsibility to access reliable information to ensure a safe environment for both staff and patients. Recognizing the benefits and disadvantages of these personal devices in the clinical setting were one of the things that were identified that could influence on how NEx/M make decision regarding the use of BYOD in the workplace. Identifying solutions were another aspect that could have an influence on decisions about the use of BYOD in the clinical setting.

5.1.4 Solutions

The fourth theme from the study results was solutions. The NEx/M decisions can be influenced by the solutions that could help manage this phenomenon appropriately and safely in a clinical setting. According to Moyer (2013), the common theme of solutions for BYOD is about developing mobile device management guidelines that include security, employee usage agreements, risk assessment, and educational training. Out of the four solutions that emerged from the NEx/M, setting clear guidelines about the use of BYOD was the one solution that was supported extensively by the literature. For example, for information system safety, one study suggested that organizations should develop a very specific policy and service agreement to help guide employees on the safe use of mobile devices (He, 2013).

According to Moyer (2013), peer-review studies were still emerging about BYOD management and how effective the implemented policies were. There were numerous recommendations found regarding BYOD solutions but they were based on corporate experts, such as Bradford Networks or Softweb Solutions whitepapers, instead of scientific research. Conversely, finding solutions and recommendations to using BYOD

devices in the clinical setting that were previously done with PDAs also proved to be difficult to find. According to Zumehly (2010), most current evaluations of PDAs were quite limited and involved primarily descriptive analyses and anecdotal accounts of how they might work. Boisvert (2012) and some of the NEx/Ms suggested that most secure and safe solution was to provide the staff the necessary tools and resources to do their job efficiently and safely.

5.1.5 Summary

In summary, how NEx/M make decisions regarding BYOD in the workplace were based on how the adoption of BYOD will affect nursing practice and quality of patient care. NEx/M concerns regarding productivity and security were valid. The NEx/Ms had recognized the benefits and disadvantages of using these devices, such as the value versus risks of BYOD that could be applied. NEx/Ms considered how they made their decisions in regards to how best to approach the BYOD phenomenon in their workplace. The NEx/M also made decisions about how BYOD could improve nursing practice, staff and patient safety, and most of all maintain and enhance quality of patient care.

5.2 Elements of a BYOD Policy

The last question in the interview asked the participants to comment on what important elements a BYOD policy should include in a clinical setting. From the participants' responses, all four elements of BYOD were very much associated with one another. For example, the clear management guidelines for clinical use of BYOD devices included all the other three elements of video, audio, and photography; privacy and security; and management and disciplinary. Setting clear guidelines will clarify

expectations about who uses the device and what type of device, as well as how, when, and where a device should be used. However, mobile device policy implementation barriers could be attributed to lack of funding and lack of information technology (IT) staff resources to support mobile device initiatives (Moyer, 2013).

The process of setting up policies and guidelines in healthcare organizations has already come along way and is continuously changing as issues arises. For example, with the popularity of social media, the American Nurses Association (ANA) and the National Council of State Boards of Nursing (NCSBN) have collaborated on guidelines for the professional use of social media (Suby, 2013). In conjunction with this work, the College of Registered Nurse of British Columbia in Canada had included in their website recommendations on how to use social media responsibly in the workplace (CRNBC, n.d.). NEx/M also have an easier alternative from implementing such formal policies, by merely emphasizing educational initiatives on controlling the way users use BYOD in the workplace.

5.3 Contributions

It was noted during the interview that a few participants were not familiar with the concept of BYOD and requiring some definition of the term. This study may provide awareness that the practice that they had observed in clinical in regards to the use of personal device was encompassed under the BYOD phenomenon. Therefore, the results of this study could aid in bringing greater awareness of BYOD within the healthcare organization and could improve the quality of the decision processes of NEx/M regarding this phenomenon. Furthermore, the study findings could also provide information for the department of health IT to allow them to collaborate with NEx/M to make appropriate

decisions as they relate to the nursing practice regarding BYOD. Often times, health IT and clinical practice departments were found to be working in silos and have different ideas of what electronic platforms to use in the clinical setting. This extends to BYOD. This research has allowed the nurses, through the NEx/Ms, to voice their vision, needs, and concerns associated with hand held technologies. This research, therefore, could be used as a starting to point for the health IT department to breach that silo system between the different practices for this research provides insight into the vision, needs, and concerns of the nursing department.

5.3.1 Contributions to Nurses

This research could influence healthcare organizations to make decisions in addressing the BYOD phenomenon. As a result of participating in this study, NEx/M, as decision makers from two healthcare organizations, were made aware that their opinions and the current situation related to BYOD are not far from one another. For example, many of the participants have the similar vision of opportunities with the use mobile technology and, yet, many have similar concerns with the use of such technology in the healthcare organization that guards personal information tremendously. They can be well assured that other nurse executives and managers in various departments and different healthcare organizations were facing similar situations. Furthermore, as nurse leaders it would beneficial and needed for NEx/M to acquire an e-health education because as decision-makers, NEx/M need to pay closer attention and understand the urgency of how personal handheld devices are being utilized in the clinical setting by their nursing staff.

5.3.2 Contributions to Health Informatics

The health IT department should also be aware of how nursing staff is utilizing personal handheld devices in the workplace. As mentioned previously, at times IT departments and healthcare professionals work in silos that each department have different ideas of what was possible in the clinical setting. There was an identified gap between what was important in the nursing practice and what health IT thought was possible to implement in the clinical setting in a safe platform (Malkary, 2012). Decision-makers from both departments need to come together and make all concerns known to each other as both have very different work backgrounds and areas of responsibility to develop practical solutions to address BYOD. The findings from this study could enable various decision makers to develop strategies to expand awareness of BYOD, managing this phenomenon, and preventing any untoward events, such as patient information breaches.

5.3.3 Contributions to Health and Nursing Informatics Education

Based on the findings of this research study, there is a need for educational collaboration between health and nursing informatics. By providing educational collaboration between these professions could offer a mutual understanding of what each profession holds necessary to support their practice and possibly fill the practice gap between mobile technology and nursing practice as they enter the workplace. For example, health informatics could include a nursing informatics module in their curriculum that delves into the nursing clinical practice to obtain understanding of what nursing holds necessary and important to support their clinical practice using technology. In this study, NEx/M have provided insight on what their vision are regarding mobile

technology and how it could improve nursing practice and how it could also hinder them. Conversely, including a health IT module within the nursing informatics curriculum could bring an understanding of the intricacies of managing mobile technology security, necessary IT support required for management, and the appropriateness of mobile device in the workplace. Seizing a collaborative educational partnership between nursing informatics and health informatics could provide a unique opportunity of partnership to improve nursing practice using mobile technology. Much is needed in terms of understanding of the mobile work in general, and within the healthcare setting in particular, and hopes that this study provides a step in that direction.

5.4 Recommendations

The elements that were identified in this study can contribute in creating guidelines and management processes in healthcare organizations to inform, address, and practice accordingly as it relates to BYOD in the workplace. Unfortunately, most policies and guidelines typically are based mainly on professional expert recommendations instead of scientific research (Moyer, 2013). Despite the lack of extensive research on policies and guidelines with BYOD, well-defined policies and guidelines in regards to BYOD are still necessary as it increases safety, improves healthcare and relates outcomes (Kabachinski, 2013).

Many of the professional experts highly recommend that healthcare organizations perform a high-level risk assessment (Astani et al., 2013; Bourque & Bentfield, S, 2012; Softweb Solutions, 2012). The risk assessment may reveal that employees are already using their own devices for the transmission of health and other work-related information. The risk assessment will reveal whether BYOD is technically and/or

financially feasible for organizations (Bourque & Bentfield, 2012). Evaluate how staff access and use electronic protected health information on their devices, whether the information is being viewed only or is the information is being stored on a mobile device (Boisvert, 2012; Courtney, 2005). Further, assessing whether the cost savings to the hospitals associated with BYOD risks, such as security breaches, theft, and loss need to be considered. As decision makers one must consider that such risks may out-weigh the potential benefits of health care professionals using their own mobile devices (Moyer 2013).

To close the gap between health IT and nursing practice, health IT should work with a professional practice that has the appropriate knowledge, experience and expertise to help them define and understand what is lacking and needed in the nursing practice. This can provide health IT with a greater understanding of the nature of nursing practice. Conversely, nursing practice also needs to connect with health IT to understand the other side of the IT departments' concerns in regards to BYOD in the clinical setting. According to Malkary (2012), health IT operates in a highly regulated industry by the Privacy Act and believes that personally owned mobile devices could introduce malicious attacks, malware and viruses to the organizations' network, which would lead to performance degradation and potential security breaches. Health IT could also provide education for nursing staff, new hires, as well, as nursing students where IT is concerned, such as what are the appropriate conducts or good practices if using personal devices in clinical to help meet the gap between IT and nursing practice. For instance, connect with the Canadian Association of Schools of Nursing (CASN) that now has a new Nursing Informatics Inventory programs for teaching and learning resources to help Canadian

nursing educators to teach nursing informatics at the undergraduate level (Canadian Association of Schools of Nursing, 2012). Understanding both sides of the concerns in regards to their own practices could lead to better and safer implementation of BYOD in the health organization.

5.5 Study Limitations

One of the main limitations of this study was the purposive sample of participants who were nursing executives/managers. Although an extensive range of participants' views and experiences were studied in this research, the small number of participants may limit the generalizability of the findings. Additionally, limiting the participants to nurse executives may have limited a full understanding of the broader situation (Myers & Newman, 2007). Because the participants came from two BC health authorities, the results of this study could possibly not represent all other healthcare organizations. However, the range of the participant views and experiences that the results found, transferability of results can be considered. There may be limitations of descriptive validity of the participants as participants may have limited what they divulged to the researcher and potentially important information for the research may be incomplete (Myers & Newman, 2007; Sandelowski, 2000). Furthermore, not all participants may have any experience with BYOD in the workplace; therefore, their responses of context and imagination could be limited due to the lack of experience in the matter. Additionally, there could be a limitation with the researchers interpretation of concepts during the process of content analysis where the researcher may fail to develop a complete understanding of the context and, therefore, failing to identify key categories

that would result in an inaccurate interpretation of the data (Hsieh & Shannon, 2005; Sandelowski, 2000).

5.6 Future Research

Since BYOD is still in its infancy in healthcare organizations, further research should be conducted to document nursing practice patterns, and determine whether personal handheld devices truly do cause distractions in the clinical setting. Additional research should evaluate the effectiveness of education, policy or guidelines in promoting appropriate use of personal handheld devices in the clinical setting. Further exploration of the organizations' inhibitory reasons for providing mobile technology to the clinical staff could provide insight as to why technology adoption is slow in healthcare organizations. Exploration of the actual number of nursing/clinical staff in BC, who are currently using personal handheld devices in the clinical setting, with and without authorization from the organization, may provide data for IT department on the potential risks factors related to BYOD within the healthcare organizations in BC. Quantitative research on BYOD may provide more generalizable information for policy makers and decision makers to adapt to this new practice in relation to this phenomenon.

5.7 Conclusion

The use of personal handheld devices in the workplace was very much visible to many and there was a need to address this practice in the clinical setting. The consumerization of these powerful handheld computerized devices has resulted in their affordability, thus prohibiting the use of these devices in the clinical setting will be difficult and may not be the appropriate as it may cause resistance and friction in the

workplace amongst the staff and policy makers. The result of this study can help guide the next step for the NEx/MS' decision and health IT on how to move forward with BYOD and to how to best support nursing practice and patient care through technology use in the clinical setting. Providing alternative solutions will be of benefit to the organizations to help address the risks with BYOD to assist in enhancing clinical practice safely. Nurse leaders need to see technologies as promising solutions, not barriers, and to integrate technology into their vision for meeting practice needs.

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Appendix A: Letter of Invitation



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BRING YOUR OWN DEVICE AND NURSE EXECUTIVES DECISION MAKING: A QUALITATIVE DESCRIPTION

You are invited to participate in a study entitled *Bring Your Own Device And Nurse Executives Decision Making: A Qualitative Description* that is being conducted by Karen Martinez, BScN.

I, Karen Martinez, am a graduate student in the Faculty of Human and Social Development in the School of Health Information Science at the University of Victoria and a registered nurse at Vancouver General Hospital. You may contact me if you have further questions by email: krenmartz@gmail.com

Purpose and Objective of the Research:

We are doing this study to learn more about personal mobile devices or Bring Your Own Device (BYOD) at the workplace in the different BC Health Authorities. This study will help us learn more about the decisions nurse executives/managers make to address BYOD within the nursing staff and what their concerns are about this phenomenon.

Participants:

Some of the characteristics in a nurse executives/managers to be included in the study are:

- 1) Are/have been registered in College of Registered Nurses of BC
- 2) have one of more years of experience in the nurse managerial/administrative role (i.e. Nurse Managers, Nursing Directors, Nurse Administrators)
- 3) hold accounts for one patient care unit.

You are being asked to participate in this study because you manage a unit of nursing staff that handles patient information. You have an understanding of the importance of maintaining and managing patient health information confidentiality and the security risks personal devices bring in the workplace.

Procedures:

- If you agree to participate in this study, you will be asked to complete an in-person or telephone interview. The interviews will be audio-recorded for transcription purposes.
- **Duration:** The interview will take approximately 30 minutes.
- **Location:** The location will be your choice to what will be the most convenient for you. It may take place in your office for some privacy. The interview can also be done by telephone.

- **Confidentiality:** There will be efforts to keep your personal information confidential all throughout the study.

If you are interested in this topic of research, please contact Karen Martinez by email at krenmartz@gmail.com

Appendix B: Screening Tool



BYOD Screening tool for Participant Recruitment

Screening Questions	Response
1. Are you registered in the College of Registered Nurses in BC (CRNBC)?	
2. What is your role in your department? (i.e. Nurse manager, nurse administrative, nursing director).	
3. How many and what department(s) do you manage? (What department: community, acute care, critical care, hospital ward)	
4. Are you a permanent, temporary or interim acting manager for the department?	
5. Are you a full-time or part-time manager?	
6. How many years of experience do you have in a managerial or administrative role?	

Appendix C: Consent Form



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Participant Information Consent Form

Project Title: BRING YOUR OWN DEVICE AND NURSE EXECUTIVES DECISION MAKING: A QUALITATIVE DESCRIPTION

Researcher: Karen Martinez, a graduate student in the Faculty of Human and Social Development, School of Health Information Science, University of Victoria and a registered nurse at Vancouver General Hospital. Contact information: Telephone - 604-339-6409, email - krenmartz@gmail.com

Supervisor: Karen Courtney, Assistant Professor, Faculty of Human and Social Development, School of Health Information Science. Contact Information: Telephone - (250) 721-8599, email - court009@uvic.ca

Purpose and Objective of the Research:

- We are doing this study to learn more about personal mobile devices or Bring Your Own Device (BYOD) at the workplace in the different BC Health Authorities. This study will help us learn more about the decisions nurse executives/managers make to address BYOD within the nursing staff and what their concerns are about this phenomenon.

This Research is Important because:

- The use of personal mobile devices (smartphone, iPads, tablets) in the health care workplace is growing rapidly because of consumerization and affordability of these devices to the public. In a U.S. hospital survey, 69% of nurses said that they and their colleagues are using personal smartphones while on the job for both personal and clinical communications. In Canada there is a legislation that requires health care organizations to be governed by Freedom of Information and Protection of Privacy Act (FIPPA) that requires them and health care providers to closely guard and protect patient health information. Therefore, research of this type is important because there is a need to explore this phenomenon starting within the nursing department as nurses represent the majority in the health care workforce that handles patient information.

Participation:

- You are being asked to participate in this study because you manage a unit of nursing staff that handles patient information. You have an understanding of the importance of maintaining and managing patient health information confidentiality and the security risks personal devices bring in the workplace
- Participation in this project is entirely voluntary.
- Whether you choose to participate or not will have no effect on your position [e.g. employment, class standing] or how you will be treated.
- Efforts will be made to keep your personal information confidential. The interview process will be done in a private location of your choice to maintain confidentiality. Any materials with your information, such as the signed consent form, and interview transcripts will be kept in separate locations to maintain confidentiality. All study information is kept within locked cabinets. Electronic data and the research computer will be encrypted and protected by firewalls which is further stored in a locked drawer within a locked office. Participants will not be identified in any publications or presentations of the study results. (See Confidentiality section).

Procedures:

- If you agree to participate in this study, there will be a few brief demographic questions that will be asked as part of the in-person or telephone interview. The interviews will be audio-recorded for transcription purposes. The interviewer will also be taking notes for reviewing content accuracy with you at the end of each interview.
- **Duration:** We anticipate it will take you approximately 30 minutes.
- **Location:** Interviews will take place at a location of your choice to what will be the most convenient for you. The interview can also be done by telephone if you prefer.
- **Inconvenience:** Participating in this study will have an inconvenience of allocating 30 minutes of your time that needs to be set aside in your day to participate in the study.

Compensation:

- There are no costs to participate in the study. You will not receive payment for taking part in this study

Benefits:

- We think this study has benefits in learning more about this BYOD phenomenon in the health care workplace. We hope this study will provide information about the decisions and ideas in regards to how BYOD is being managed and should be managed in the nursing workplace.

Risks:

- For this study, the risk to you is minimal. You may experience some discomfort or boredom answering some questions in the study. If you feel uncomfortable, you may opt out of answering any particular question. No personal identifiers,

such as name or address, will be collected as data for this study. Any potential identifiers, such as unit location, will be removed from transcripts. Only the researcher and the thesis supervisory committee will have access to the research data. There will be demographic questions that will be collected before the interview. Although every effort will be made to ensure privacy, the risk is possible loss of confidentiality.

Withdrawal of Participation:

- You may withdraw at any time without explanation or consequence.
- Your data may be withdrawn from the study at your written request at any time until the registry master list with your identification is destroyed.
- To withdraw from the study, please contact the main researcher in writing.

Confidentiality:

- Efforts will be made to keep your personal information confidential. We cannot guarantee absolute confidentiality. Your personal information may be disclosed if required by law. Because of the small sample size for this study, it may be possible that your colleagues could guess who has been invited to participate in the study. The researcher will report the results in high (health authority) level and not facility- or unit-level to minimize the identification of participants. Administrators in your institution will not know whether or not you have participated in the study. Study results will be reported in group form. Once results have been analyzed and the required time for record keeping has ended, the data and audio recordings will be destroyed according to the destruction of data under the University of Victoria Records Management Policy.
- **The efforts to maintain your personal information private are as follows:** You will not be identified in the study and a unique code numbers will be assigned to you all through out the study. The master list with your contact information and corresponding code numbers will be kept in a locked file. Any materials with your information, such as the signed consent form, and interview transcripts will be kept in separate locations to maintain confidentiality. The personal home computer that will contain the research data will be fully encrypted along with being kept in the locked drawer in a locked office for further security. Further, this computer that will be used to analyze the study data will be protected with both software and hardware firewalls.

Research Results will be Used in the Following Ways:

- The results of this study will be reported in a graduate thesis and may also be published in journal articles or conference proceedings.

Questions or Concerns:

- Contact Karen Martinez at ph# 604-339-6409; email krenmartz@gmail.com
- Contact the Human Research Ethics Office, University of Victoria at (250) 472-4545 or at ethics@uvic.ca
- Contact the Island Health Research Ethics Board at (250) 370-8620 or at

researchethics@viha.ca

Consent:

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers, and that you consent to participate in this research project.

Name of Participant

Signature

Date

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Appendix D: Interview Questions



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BYOD DEMOGRAPHIC AND INTERVIEW QUESTIONS

First of all, thank you. I really appreciate the time that you are taking to participate in my research study.

Before we begin with the interview.

I'll quickly review the background about the study you will be participating in:

It is very common to see smartphones or iPads anywhere you go. Now what happens if these personal devices are brought into the workplace? Are nurses entering patient information in these devices or accessing the hospitals or organizations' network? We don't know. This is the purpose of my study is that I am exploring this phenomenon of personal mobile devices for personal and clinical use at work.

This interview is approximately 30 minutes. There will be efforts to keep your personal information confidential. You may opt out of answering any of the questions that makes you uncomfortable answering. With your permission the interview will be audio recorded for the purpose of transcribing and for data accuracy. I will also writing down notes during the interview to review with you at the end, so please bare with me at times when you hear me typing during the interview.

Part of the study is a few demographic questions about the participants. Let's begin with those questions: So first question

<u>DEMOGRAPHIC QUESTIONS</u>
<u>Participant Code:</u>
Age: _____ Gender: _____
How many year have you been: (1) Nursing: _____ (2) Managerial Role: _____
Highest Degree in Nursing: _____
Highest Degree in Non Nursing: _____
Current Responsibilities:

Number of Departments you are managing: _____

Unit Description: Ward _____ High Acuity _____ Critical Care _____ Community _____

Let's now begin the interview questions. Please be as open and descriptive as you can be. Speak slowly and clearly.

INTERVIEW QUESTIONS

1) *So as I have mentioned before that smart phones and tablets are common to see. What are your thoughts about staff using personal mobile devices in the workplace?*

- a) *Has there been any instance where you have seen certain devices such as smartphones and iPads being used in what looked like in a clinical setting?***
- b) *What about when they use these devices at the patients' bedsides?***

2) *In your experience, has this been a positive or negative experience regarding staff using personal devices at work?*

- a) *Can you give me a description of what happened?***
- b) *Has there been any instance that you, as a manager, need to have to manage or control over the use of personal devices in the workplace? How did you try to manage this?***

3) *Let's look at a scenario, if one of your Team Leaders asks you if they could use their own iPads or tablets to manage any types of information in the unit, whether it's for statistics, or patient flow management, or any work related projects in your unit? And they gave the reason that its easier to use their own device. What are your thoughts about that?*

- a) *Are there any existing protocols, policies or procedures that you know of?***
- b) *What does it mean to you about mixing the use of this device for personal and professional use?***

What are your thoughts about a policy that addresses this?

4) *Looking into the future, how do you see the evolution for the use of such personal devices at work? For instance, if there is a need to use personal devices for work to easily work with or access and share information at any time and any place within your team leaders or any other multidisciplinary team?*

- a) *What are your thoughts regarding staff, such as your charge nurse, NP, CML, transitional services, accessing work information, emails, applications and patient health information at all times in their own personal device?***

5) *Do you think with using personal devices at a workplace can build productive workflow or quite the opposite?*

- a) *How do you think having these mobile devices could impact the workflow with***

nursing staff? b) In your experience how have you managed this impact in the workflow?
6) In your opinion, what are the disadvantages to the organization of using personal devices at work? a) What do you think are the risks when nursing staff use personal devices at work? b) What are your actions towards these risks? c) What is your take on compliance issues when it comes to security?
7) What security and confidentiality of the patients' health information concerns do you have regarding with these devices? a) What are your thoughts about if a nursing staff tells you that they lost or had their mobile device stolen and it contains patient health information? b) What are your thoughts regarding privacy matters with storing patients information on a personal owned mobile device? c) What are/would your actions when you find out if this is being done by one of your staff?
8) If there would be a policy, what are some of the elements that should be regarding using a personal device at a workplace? a) What do you think are the important issues that should be covered with regarding using personal devices to use for work that a policy should address?
9) Additional comments: a) <i>Are there any other comments regarding this topic that you may want to add?</i>

Appendix E: Ethics Approval



UVic/VIHA Joint Research Ethics Sub-Committee
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Vancouver Island Health Authority, Memorial Pavilion, Kenning Wing
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 Tel 250-370-8261 Fax 250-370-8106 Web www.viha.ca

Certificate of Approval

PRINCIPAL INVESTIGATOR: Karen Martinez	ETHICS PROTOCOL NUMBER	J2013-062
POSITION: Master's Student	ORIGINAL APPROVAL DATE:	15-Oct-13
DEPARTMENT: HEIS	APPROVED ON:	15-Oct-13
SUPERVISOR: Dr. Karen Courtney	APPROVAL EXPIRY DATE:	14-Oct-14
PROJECT TITLE: Bring Your Own Device Policy And Nurse Executives Decision Making: A Qualitative Description		
RESEARCH TEAM MEMBERS: Karen Courtenay, Supervisor (UVic) Elizabeth Borycki, Committee Member (UVic)		
DECLARED PROJECT FUNDING: None		
CONDITIONS OF APPROVAL		
<p>This Certificate of Approval is valid for the above term provided there is no change in the protocol. Extensions or minor amendments may be granted upon receipt of a Request for Annual Renewal or Modification form.</p> <p>Amendments To make any changes to the approved research procedures in your study, please submit a "Request for Modification" form. You must receive ethics approval before proceeding with your modified protocol.</p> <p>Extensions Your ethics approval must be current for the period during which you are recruiting participants or collecting data. To renew your protocol, please submit a "Request for Annual Renewal" form before the expiry date on your certificate. You will be sent an emailed reminder prompting you to renew your protocol before your expiry date.</p> <p>Project Closures When you have completed all data collection activities and will have no further contact with participants, please notify the UVic/VIHA Joint Research Ethics Sub-Committee by submitting a "Notice of Project Completion" form.</p>		
Certification		
<p>This certifies that the UVic/VIHA Joint Research Ethics Sub-Committee has examined this research protocol and concluded that, in all respects, the proposed research meets the appropriate standards of ethics as outlined by the University of Victoria Research Regulations Involving Human Participants and the Vancouver Island Health Authority Research Ethics office.</p>		
<p>_____ Dr. Rachael Scarth Associate Vice-President, Research</p>		<p>_____ Dr. Louise Costello Acting Co-Chair, Joint UVic/VIHA Sub-committee</p>

J2013-062
 Martinez, Karen

Certificate Issued On: 15-Oct-13

Appendix F: Island Health Institutional Approval



Research and Capacity Building
Memorial Pavilion – Main Floor | Royal Jubilee Hospital | 1952 Bay Street | Victoria, BC V8R 1J8

INSTITUTIONAL APPROVAL TO CONDUCT A RESEARCH PROJECT

RESEARCHER: Karen Martinez

STUDY TITLE: Bring Your Own Device Policy and Nurse Executives Decision Making: A Qualitative Description

FILE NUMBER: J2013-062

APPROVAL DATE: 15 NOV 2013

This is to inform you that your research project is approved based upon the following:

1. The Joint UVic-VIHA Research Ethics Subcommittee Certificate of Approval, dated 15 OCT 2013.
2. All VIHA Operational Review approvals, received by Research and Capacity Building, including Nursing Portfolios A, B, and C (with the exception of Director for Surgical Services and Ambulatory Care).

The Institutional Approval to Conduct a Research Project will remain in effect as long as the Joint UVic-VIHA Research Ethics Subcommittee Certificate of Approval is renewed annually and all amendments submitted are approved as required throughout the duration of this project. The Institutional Approval to Conduct a Research Project will expire upon the receipt and acknowledgement of the study closure report.

LIVING
OUR VALUES

Our Values

Courage: to do the right thing – to change, innovate and grow.

Aspire: to the highest degree of quality and safety.

Respect: to value each individual and bring trust to every relationship.

Empathy: to give the kind of care we would want for our loved ones.

Cindy Trytten
Director, Research and Capacity Building

Appendix F: Vancouver Coastal Health Research Institute Approval



W. Robert McMaster, D. Phil.
Vice President, Research, Vancouver Coastal Health
Executive Director, Vancouver Coastal Health Research Institute
Associate Dean Research, Faculty of Medicine
The University of British Columbia

October 23, 2013

Karen Martinez
Vancouver General Hospital
Cardiac Surgery ICU
899 West 12th Avenue
Vancouver, B.C. V5Z 1M9

Vancouver Coastal Health Authority Research Study #UVIC-J2013-062

FINAL CERTIFICATE OF APPROVAL

TITLE: Bring Your Own Device Policy And Nurse Executives Decision Making: A Qualitative Description
SPONSOR: Unfunded

This is to inform you that your project has been approved and can start immediately. Approval has been granted until **October 14, 2014** based on the following:

1. UVIC/VIHA Joint Research Ethics Board Certificate of Approval J2013-062
2. Vancouver Coastal Health approval

Yours truly,

Dr. W. Robert McMaster
Vice-President Research, Vancouver Coastal Health
Executive Director, Vancouver Coastal Health Research Institute