The factors influencing nurse graduates use of mobile technology in clinical settings in Perth Western Australia: A mixed method study

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Chapter 1

Introduction and Background

Introduction
Chapter one provides an introduction and background to the study. It portrays the issues and problems underpinning the study and clarifies the purpose, research questions objectives and significance. Additionally, it discusses the role of researcher reflexivity, and details the researcher’s previous experience that underpinned the study. This chapter will conclude with an overview of the thesis chapters.

Issues and problems underpinning the study
Healthcare is increasingly technology-dependent with mobile technology devices connecting to national and international information. Many health professionals use mobile technology to guide clinical care and for continuing education. Health resources such as e-books, point of care guides, drug guidelines and search engines provide access to up-to-date research, guidelines and protocol’s that support the use of evidence based practice. Additionally, these devices enable communication and networking with other health professionals. A benefit of mobile technology is that it can fit conveniently into a person’s pocket.

The number of health professionals using smartphones and other mobile devices in the clinical setting is increasing (Mosa, Yoo & Sheets, 2012). A systematic review of healthcare applications for smartphones found that smartphones make useful tools for evidence-based practice at the point of care, for mobile clinical communication and for remote monitoring of patients. Importantly, smartphones can play a very important role in patient education and self-management of disease (Mosa, Yoo & Sheets, 2012).

University libraries encourage smartphone and tablet access to resources available online, through University student and staff portals. These resources are carefully selected, with access to hospital and health organisations to assist in the transition from theory to practice in clinical settings for students in health related
courses. The literature suggests students in the learning environment of a University and nurses in clinical settings are motivated to use mobile technology. Healthcare applications for mobile technology are known to enhance learning and productivity (Farrell & Rose, 2008; George, Davidson, Serapiglia & Barla, 2010; Koeniger-Donohue, 2008; Hudson & Buell, 2011; Patillo, Brewer & Smith, 2007; Wu & Lai, 2009; & Secco, Jamieson, Profit, Bailey, Brennick, Whitty-Rodgers, 2010).

A number of health institutions worldwide have embraced mobile technology. One Canadian hospital, for example, supplied approximately 2,000 iPad2 units to health professionals, following a successful pilot study into the use of mobile technology. The hospital also developed an in-house app called the ‘Clinical Mobile Application’ to provide physicians with access to information resources as well as the ability to view diagnostic results. The hospital enhanced the app with a picture archiving and communication system (PACS) viewer, and voice recognition system for recording electronic physician orders and notes (Mobile Healthcare Today, 2011).

Anecdotally, in WA hospitals, there is a lack of information and clarification on the use of mobile technology in the clinical settings. In some clinical settings, nurses are instructed in memos to switch off their mobile technology, despite there not being any policy or guideline supporting this action. Other clinical settings appear to have a more liberal policy, allowing nursing staff to utilise mobile technology with specific guidelines for its use. Initial enquiries into hospital guidelines/regulations and policy regarding mobile technology revealed inconsistencies across health services and lack of information regarding staff and students using their own devices in the clinical settings.

There are also inconsistencies within the hospital systems regarding access to resources offered by the library services. For example, at the Child and Adolescent Health Service in Perth WA, mobile technology has been embraced through online subscriptions to resources. Recommendations on applications (apps) and websites have also been communicated to staff and students. Unfortunately, however, nursing staff are prohibited to use smartphones in clinical settings with regular memos reminding staff of this directive (personal communication, The Head of Department for the Library and Information Service 13th May 2013).
Similarly, at one major public hospital in Perth there are a large number of resources available for staff and students using mobile technology. The library staff make these resources available by promoting and supporting their use (Head of Department, Library and Information Services, personal communication, 14th May 2013). Currently, evidence suggests that medical staff are allowed and encouraged to use this technology in clinical settings. In an Intensive Care Unit (ICU) for example, medical staff were permitted to use mobile technology, but they must be a minimum of 1 metre from medical equipment. Nurses in the same unit, however, were instructed to turn off mobile phones (Clinical Nurse Manager of an Intensive Care Unit memorandum, 16th November 2005).

Nurses, midwives and student nurses are bound by a standard of practice, which guide the provision of care dictated by Nursing and Midwifery Board Australia, (2008). Currently, there is a policy outlining issues regarding social media. These do not, however, detail the use of mobile technology. In a hospital environment, nurses, midwives and nursing students are obligated to practice under the guidance of hospital policies, guidelines and standards with direction from nurse managers, nurse educators and nurse executives. The hospitals and other healthcare agencies, expect the same professional standards from students as their staff. These include professional presentation, punctuality, work ethics and standards of practice (Levett-Jones & Bourgeois, 2007).

Within the WA public healthcare hospital system, the Department of Health (DOH) provides operational directives and information circulars to inform staff and others of state-wide policies, guidelines and frameworks applicable to people who work in the public healthcare system. These modes of communication operate through:

**Operational Directives:** Operational directives are policy statements that are approved by the Director-General of Health and are mandatory for all WA Health staff to comply with.

**Information Circulars:** Information Circulars (IC’s) are documents that provide advice or guidance within WA’s public health system. IC’s are not policy statements, although they may be used to advise the existence or change in status of a policy statement (Government of Western Australia, Department of Health, 2015, p.1.).
The Department of Health (2015) lists two policies and guidelines for mobile technology use in clinical settings. Mobile telephone policy and guideline (OD 0337/11) only applies, however, to mobile devices supplied by the Department of Health. An acceptable use policy-information and communications technology (OD 0468/13) discusses computing using WA health resources. Neither of these policies, however, address the use of personal, mobile devices.

Within the Universities in WA that offer an undergraduate nursing degree, it is an expectation that students use their mobile technology on their clinical practice rotations. This directive is provided in an online format in the Nursing Competency Assessment Schedule (NCAS). This documentation provides formal evidence that a student has attended their clinical rotation, and has met the Nursing and Midwifery Board of Australia (NMBA) registered nurse standards for practice (2016). In addition, the NCAS document is a standardised assessment tool used by students and facilitators in many Universities across Australia.

University libraries encourage smartphone and tablet access to resources available online, through University student and staff portals. These resources are often recommended by academics and industry professionals and are utilised for teaching and learning purposes within specific healthcare courses. Additionally, many universities have designed software for mobile technology, together with best practice guidelines for educators and students. This has facilitated the role of the educator to change, as students engage in more informal learning outside the classroom (Johnson, Adams Becker, Cumins, Estrada, Freeman and Ludgate, 2013). It is suggested that the future for tertiary education will be defined by students being able to work, learn and study whenever and wherever they want, using their own mobile technology (Johnson, Adams and Cumins, 2012). For nursing academics, the challenges to the use of mobile technology for learning, lies in balancing learning resources with policies, guidelines and standards in clinical settings.

Technology has a direct influence on knowledge, skills, practice, values, ethics, and politics within nursing (Barnard, 2015). With a rapidly changing society, the meaning and implications of technology for nursing practice alters. This brings ongoing challenges for the new graduate and experienced nurses (Barnard, 2015).
The problem arises when students want to use their mobile technology in hospitals that do not have a policy or guideline on its appropriate use.

Thus, there is a need to investigate what factors may influence mobile technology use for nurse graduates; to what extent they may currently use the technology for the betterment of patient care; and to investigate the role of their supervisors when directing the graduate to use or not to use within the clinical setting.

**Study purpose**
The purpose of this study was to identify and explore factors influencing nurse graduates use of mobile technology in clinical settings in Perth, Western Australia.

**Research questions**
1. What factors influence nurse graduates use of mobile technology in the clinical setting?
2. To what extent and in what ways do nurse graduates currently use mobile technology in the clinical setting?
3. What are the perceptions of nurse coordinators, educators and managers of graduate programs, regarding mobile technology use in the clinical setting?

**Objectives**
- Review existing policies and guidelines for mobile technology use in the clinical settings;
- Develop a survey based on the proposed theoretical TAM2 framework and undertake construct validity testing;
- Describe findings from the survey;
- Synthesize the findings from the survey to frame questions for the online text-based focus group interviews with nurse graduates;
- Investigate the role of nurse coordinators, educators and managers of graduate programs, regarding mobile technology;
• Synthesise the findings from both the quantitative and qualitative phases of the study;
• Provide recommendations from findings.

Study significance
This study is significant in that currently there are few standardised policies issued by healthcare institutions to guide the use of mobile technology in the clinical setting. This issue has created a potential gap between learning as a student nurse in the University setting and the application as a graduate in clinical setting. The results of this study may lead to policies and guidelines being reviewed by local healthcare agencies and may lead to review of current mobile technology integration into an undergraduate degree. Importantly, mobile technology may help to bridge knowledge gaps graduates may have, and increase their confidence at the point of care, which can lead to better patient care. There is a need to delve more deeply into the complexities of technology in nursing, as it is a major influence in healthcare outcomes and experiences (Barnard, 2016). Further evidence is required that addresses the relationship between nursing and technology by examining: its effects in the clinical setting; efficiencies; its relationships between nursing and caring; and the range of philosophical questions that may arise from the empowering of people in their healthcare choices (Barnard, 2016). Some scholars suggest, that it is our duty as nurses within a patient advocate role, to occupy ourselves with the errors, advantages, difficulties, and temptations of technology for the benefit of those who most need our assistance and advocacy (Barnard, 2016).

Study context and setting
There are approximately 1045 student registered nurses graduating annually from four universities in Western Australia (Parliament of Western Australia, 2013; Nursing and Midwifery Office, 2014). These include the University of Notre Dame Australia (UNDA), Edith Cowan University (ECU), Curtin, and Murdoch Universities. Students from these universities will have spent a considerable amount of time in clinical settings across both the public and private healthcare sectors in WA. Graduates having completed their undergraduate nursing degree, are registered
as a health practitioner with the Australian Health Practitioner Regulation Agency (AHPRA). Registration is mandatory for all nurses and midwives in Australia in order to meet the regulatory standards for practice.

The majority of new nurse graduates apply to the Health Department’s GradConnect system. This online system lists graduate nurse programs available across a number of metropolitan and country locations and includes both public and private hospitals (Parliament of Western Australia, 2013; Nursing and Midwifery Office, 2014). The majority of graduate programs are located at Fiona Stanley Hospital (FSH); Royal Perth Hospital (RPH); Sir Charles Gairdner Hospital (SCGH); and St. John of God Hospitals (SJOGH)-Murdoch and Subiaco.

**Researchers background**

When investigating what factors may influence mobile technology use for nurse graduates, a mix of research methods and methodologies was required. As both quantitative (objective) and qualitative (subjective) methods were utilized within the study, it was important to acknowledge the role of reflexivity and how the researchers underlying values, assumptions, and beliefs may have affected the research process (Lockyer, Gondocz, & Thivierge, 2004). This transparency was important from a qualitative perspective, as reflexivity has also been identified as a resource rather than a cause of bias (Liamputtong, 2009). Furthermore, when reflexivity was transferred from knowledge to recommendations (actions) in the later stages of the study, the researcher was able to recognise possible biases and perceptions from within the field of practice (Alley, Jackson & Shakya, 2016). Thus, the following description provides details of the researcher’s previous experience and background that underpins the study and is written in the first person.

As a senior registered nurse (RN), I have worked mainly in critical care areas in both a clinical and education role. Within these roles, I have observed new staff and students to the Intensive Care Unit (ICU) facing significant stressors, such as the high acuity of the patients. In my experience, an additional challenge was that most of the resources such as hospital policies, drug guides and guidelines, which were previously available in the nurse’s station, moved to the hospital intranet that could only accessed with a secure password by regular staff.
As a nurse clinician and educator I noted a culture of sharing many new and exciting innovations in mobile technology that could assist nurses to provide patient care. For example, mobile technology apps provided basic translation for patients, whilst waiting for formal interpreter services. Additionally, when learning about a new piece of equipment such as a ventilator for example, a mobile ventilation app simulator, enabled flexible learning in a less scary situation than if the ventilator was connected to a patient. Another use of mobile technology was being able to search for an unfamiliar medication or disease at the bedside. Subsequently, increased confidence was noted in being more prepared, when speaking with family members about their significant other’s illness and medications.

When there was a transition to a ward PC (Personal Computer) for every ICU bedscape, nursing management debated, whether to allow each ward PC to be connected to the Internet. At the time, they felt that nurses could have become distracted from patient care. Such attitudes led me to believe, that there was an element of mistrust and paternalism from nursing management. Although most bedside ward PC’s were eventually connected to the internet, access was still a challenge for graduates and students due to difficulties with accessing the system; their unfamiliarity in navigating the hospital software and the available resources to find information required.

A further challenge to graduates was the potential to be viewed by others as behaving unprofessionally when using mobile technology for learning or at the point of care. I noticed graduates continually trying to justify their appropriate use of mobile technology. In contrast, however, many awake or longer term ICU patients would use their mobile technology, to stay in contact with family members; for entertainment; or to communicate with staff if they were unable to speak due to an artificial airway device.

A fear of interaction with ICU equipment was a concern for nursing management, with most visitors being asked to turn off their devices. The same instruction, however, was not enforced for medical staff, who often received calls and frequently used their devices at the bedside to communicate, and find information and resources at the point of care. Underpinning these discrepancies was
the lack of hospital policies or guidelines directing the use of mobile technology. Such direction came from nursing management, who varied in their support.

Since transitioning to academia, I noted nursing students were encouraged to access most of their University resources on their mobile phones, iPad’s, and laptops for their learning, assessment, and communication. Students accessed eBooks; apps for medication calculations; course outlines; University policies; University maps; and enrol into courses.

Based on my experience, it was pertinent to investigate: the factors that may have influenced graduates use of mobile technology; to what extent they currently use the technology; and to investigate the role of that their supervisors play when directing the graduate in the use of mobile technology in the clinical setting. The assumption was, that discrepancies and inconsistencies related to mobile technology, has created a potential gap in the transition of theory to practice for newly graduated nurses in clinical settings.

**Conclusion**

In conclusion, chapter one has highlighted the discrepancies and inconsistencies related to mobile technology use in the clinical setting. Such factors may have created a potential gap in the transition of theory to practice for nursing students and newly graduated nurses. An assumption is that these factors may be associated with a lack of standardised policies across clinical settings. In order to investigate what national and international studies have found in relation to graduate’s use of mobile technology in the clinical area, chapter two will provide an overview of the literature.

The literature review, will briefly discuss key concepts associated with mobile technology use by nurse graduates. These concepts will set the background for the proposed study and will include: nursing students and graduates use of mobile technology; mobile technology in learning and teaching; mobile technology use by health professionals; policies and guidelines associated with mobile technology in the clinical setting; and factors influencing the use of mobile technology in healthcare.
Chapter three details the methodology, including the mixed method explanatory sequential design used in the study. It will also provide a brief discussion on the philosophy underpinning mixed method approach to research. The remainder of the chapter concerns the development and testing of the draft survey.

Chapter four describes the quantitative phase of the study. It will detail the process involved in the promotion and administration of the online survey, the data collection methods, and the subsequent analysis and presentation of the results. It will provide an overview of the findings that required more explanation and exploration, that were subsequently used to develop the open-ended questions for the online text-based focus group interviews.

Chapter five described the qualitative phase of the study. It will detail the sequence of methods, analysis of data and the finding. It will conclude with a brief synopsis of the chapter prior to the final discussion chapter.

Chapter six provides a synthesis of the findings from both the quantitative and qualitative phases of the study, juxtaposing them with the research questions. The chapter concludes by discussing the limitations of the study, together with recommendations.