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Use of Research by Undergraduate Nursing Students: A Qualitative Descriptive Study

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Abstract

Research utilization (RU) is crucial to preparing the next generation of registered nurses, since they are expected to stay abreast of research, read and use existing research to improve their ability to solve problems, and make decisions independently in clinical settings. Also, baccalaureate nursing programs often identify RU as an expected curricular outcome. The purpose of this study was to identify nursing students' perceptions about RU. In this study, we used a sequential mixed methods approach. In this paper, only qualitative analysis related to RU is reported. A qualitative descriptive design was used to address the study questions. A purposive sample of 20 undergraduate students enrolled in their final year of study in BScN programs (four-year basic, honors, and accelerated programs) was recruited via e-mail to participate in the study. The study findings were categorized into the components of the Promoting Action on Research Implementation in Health Services (PARIHS) framework, which is comprised of evidence, context, and facilitation. Findings disclosed some key themes that nursing students perceive as facilitating or restricting their use of research. These themes include level of education preparedness, clinical experience and expertise, lack of time, theory practice gap, and clinical evaluation criteria, nursing faculty support for using research, and faculty's' competency in research. The majority of students stated that they did not utilize the research findings in clinical practice. Insufficient knowledge about RU was the most prominent reason. These results suggest that students should be encouraged and supported to utilize research findings in their practice settings

Keywords

Nursing, Students, Nursing Research, Research Utilization, Evidence-Based Practice

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Use of Research by Undergraduate Nursing Students: A Qualitative Descriptive Study

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Research utilization (RU) is crucial to preparing the next generation of registered nurses, since they are expected to stay abreast of research, read and use existing research to improve their ability to solve problems, and make decisions independently in clinical settings. Also, baccalaureate nursing programs often identify RU as an expected curricular outcome. The purpose of this study was to identify nursing students' perceptions about RU. In this study, we used a sequential mixed methods approach. In this paper, only qualitative analysis related to RU is reported. A qualitative descriptive design was used to address the study questions. A purposive sample of 20 undergraduate students enrolled in their final year of study in BScN programs (four-year basic, honors, and accelerated programs) was recruited via e-mail to participate in the study. The study findings were categorized into the components of the Promoting Action on Research Implementation in Health Services (PARIHS) framework, which is comprised of evidence, context, and facilitation. Findings disclosed some key themes that nursing students perceive as facilitating or restricting their use of research. These themes include level of education preparedness, clinical experience and expertise, lack of time, theory practice gap, and clinical evaluation criteria, nursing faculty support for using research, and faculty's' competency in research. The majority of students stated that they did not utilize the research findings in clinical practice. Insufficient knowledge about RU was the most prominent reason. These results suggest that students should be encouraged and supported to utilize research findings in their practice settings.
Keywords: Nursing, Students, Nursing Research, Research Utilization, Evidence-Based Practice

Translating research findings into practice is of considerable importance to the health of individuals worldwide (Athanasakis, 2013; Madon, Hofman, Kupfer, & Glass, 2007; Mutisya, KagureKarani, & Kigondu, 2015; Sanders & Haines, 2006; Wang, Jiang, Wang, Wang, & Bai, 2013). Internationally, there is a strong emphasis on evidence-based or research-based nursing practice (Kajermo, Bostrom, Thompson, Hutchinson, Estabrooks, Wallin, 2010; Melynk, Gallagher-Ford, Long, & Fineout-Overholt, 2014; Squires, Estabrooks, Gustavasson, & Wallin, 2011a; Squires, Hutchinson, Bostrom, Cobban, & Estabrooks, 2011b; Thompson, Estabrooks, Scott-Findlay, Moore, & Wallin, 2007) In fact, learning to critically appraise and use research evidence is now an important nursing education objective.

The term *evidence-based practice* has recently become part of nursing jargon and has been used interchangeably with research utilization (RU); however, the terms are not synonymous (Estabrooks et al., 2008). Evidence-based practice is defined as using all evidence (including research studies, pathophysiology knowledge, expert opinion, clinical experience, patient input, quality improvement data, and case reports) to inform best practices (Estabrooks et al., 2008). Evidence-based practice is a more general term and encompasses RU. RU on the other hand is the translation of scientific evidence from research to improve the quality of care in practice. In this paper the word *research* in RU denotes only the findings of (usually scientific) research (Estabrooks et al., 2008).

RU is crucial to preparing the next generation of registered nurses, since they are expected to stay abreast of research, read and use existing research to improve their ability to solve problems. This preparation is a key element in improving the use of research in clinical practice (Halabi & Hamdan-Mansour, 2010). The Canadian Association of Schools of Nursing (CASN) National Nursing Education Framework (2014) outlines guiding principles and essential components for undergraduate nursing education. Domain two of the Association's framework states that "baccalaureate nursing programs foster the development of critical thinking and research abilities to use evidence to inform nursing practice" (2014, p. 10). The College and Association of Registered Nurses of Alberta (CARNA)'s entry to practice competencies also emphasize the importance of evidence-informed care, specifying that graduates are expected to "incorporate knowledge of current theory, best practice clinical guidelines, and research in carrying out decisions and implementing care" (CARNA, 2013, p. 19). In keeping with these expectations, the purpose of this study was to identify nursing students' perceptions of RU. This study answers the following questions:

- To what extent do undergraduate nursing students apply research findings in practice?

- What barriers did nursing students experience that prevented them from using research findings in practice?

Literature Review

A current, persistent and prevailing philosophy in nursing and healthcare is that healthcare professionals should use research evidence when making decisions related to client care (Athanasakis, 2013; Chien, Bai, Wong, Wang, & Lu, 2013; Kajermo et al., 2010; Squires et al., 2011a; Squires et al., 2011b; Thompson et al., 2007). Nurses must use research to inform their practice and are encouraged to adopt this philosophy by using a variety of strategies (Squires et al., 2011a; Squires et al., 2011b) that include expanding electronic databases, increasing the emphasis on research in nursing curricula, and critically appraising published research in order to adequately evaluate research for nursing practice. In addition, practitioners are exposed to standards, clinical guidelines, and auditing as part of the quality assurance process, all of which are intended to incorporate/utilize research findings to some extent. Using pertinent research findings in clinical practice (and evaluating the effectiveness of the changes) closes the gap between research and practice (Wangensteen, 2010). For example, studies have shown that implementing research-based clinical guidelines has the potential to improve nursing interventions, positive patient outcomes, and quality of care (Athanasakis, 2013; Chien, Bai, Wong, Wang, & Lu, 2013; Kajermo et al., 2010; Profetto-McGrath, 2005; Seymour, Kinn, & Sutherland, 2003; Squires et al., 2011a; Thompson et al., 2007; Wallin, 2009).

However, RU scholars continuously express concern about whether nurses use the best available scientific (*i.e.*, research) evidence to guide their clinical practice (Estabrooks, Kenny, Adewale, Cummings, & Mallidou, 2007; Alp-Yılmaz & Tel, 2010; Wangensteen, Johansson, Bjorkstrom, & Nordstrom, 2011; Forsman, Wallin, Gustavsson, & Rudman, 2012a). In a widely-cited report based on data from the US and the Netherlands, Grol and Grimshaw (2003) stated that 30% to 40% of all patients do not receive healthcare based on current relevant knowledge and that as many as 20% to 25% of all patients receive harmful or unnecessary care. According to the World Health Organization (2004), "Stronger emphasis should be placed on translating knowledge and research into action to improve public health by bridging the gap of what is known and what is actually done" (p. V).

Nurses' RU has been extensively investigated by drawing on diverse nursing samples in various contexts and using different measurement instruments (Kajermo et al., 2010). A systematic review conducted by Squires et al. (2011b) to investigate the extent of nurses' RU in clinical practice reported a moderate-high RU in the majority of the included studies. A Few studies also reported low research use by nursing students and newly graduated nurses (Forsman, Rudman, Gustavsson, Ehrenberg, & Wallin, 2010; Forsman et al., 2012a; Wangensteen et al., 2011). Such results lead to questions about how well undergraduate nursing programs are preparing their students to use research. Educational reforms have moved nursing programs into university level education and strongly emphasized RU in nursing curricula (Spitzer & Perrenoud, 2006a, 2006b; Forsman et al., 2012a; Florin, Ehrenberg, Wallin, & Gustavsson, 2012). However, the content of nursing education and the transition from education into working life (e.g., the integration of education and practice as well as the ability of students to access and interpret and analyze research) remains a challenge (Hofler, 2008; Hegarty, Walsh, Condon, & Sweeney, 2009; Florin et al., 2012).

Several studies have identified the barriers that are preventing registered nurses' RU in practice settings. Based on these studies, numerous individual, organizational, and contextual factors have been identified as influencing healthcare providers' use of research in practice (Forsman et al., 2012a, 2012b; Halabi & Hamdan-Mansour, 2010; Wangensteen et al., 2011). However, both individual and organizational factors have been insufficiently studied (Meijers, Janssen, Cummings, Wallin, Estabrooks, & Halfens, 2006; Squires et al., 2011a). Little is known about how or whether undergraduate nursing students use research findings, despite the increased academic focus on using research in nursing education and practice. Florin and his colleagues (2012) investigated nursing students' experience of educational support for RU at 26 universities in Sweden. The study found major differences in students' experiences; the extent to which their academic education provided support for RU depended on what university they attended. The study also found that educational support for RU during classroom teaching time was rated higher than the support given during clinical time. The study also found a gap between theory and practice. To our knowledge, nursing students' perceptions about RU in clinical practice have scarcely been studied. Nursing students are expected to be prepared to provide evidence-based care. This implies that they should possess the necessary knowledge and skills required to use research in clinical practice. Previous studies have reported relatively low use among practicing registered nurses, which leads to questions regarding undergraduate nursing students' preparation for using research in practice.

Theoretical Framework

Several conceptual frameworks published in the literature suggest that RU is a complex phenomenon that should be examined from multiple perspectives (Mitchell, Fisher, Hastings, Silverman, & Wallen, 2010; Sudaswad, 2007). The theoretical framework chosen for this study is the (PARIHS) framework (Kitson, Harvey, & McCormack, 1998; Rycroft-Malone, 2004). Figure 1 depicts the organization and relationships of components within the framework.

The PARIHS framework which was developed by Kitson et al. (1998) has undergone several revisions and continues to evolve based on emerging evidence (Harvey et al., 2002; Kitson, 2009; Kitson et al., 2008; Rycroft-Malone et al., 2002; Rycroft-Malone et al., 2004). According to this framework, three elements (evidence, context, and facilitation) are considered necessary to successfully implement research into practice (McCormack et al., 2002; Rycroft-Malone et al., 2002; Rycroft-Malone, 2004). Successful research implementation which is synonymous with research utilization is a function of evidence, context, and facilitation and the interrelationships among these three elements (Helfrich et al., 2010). The PARIHS model has been used as the conceptual framework in a variety of health

care settings (e.g., acute care, pediatric/neonatal, psychiatric, rural hospital) in several recent studies, including studies with Canadian populations (Cummings, Estabrooks, Midodzi, Wallin, & Hayduk, 2007; Cummings, Hutchinson, Scott, Norton, & Estabrooks, 2010; Estabrooks, Midodzi, Cummings, & Wallin, 2007; Jansson, Bahtsevani, Pilhammar-Andersson, & Forsberg, 2010; Wright, McCormack, Coffey, & McCarthy, 2006).

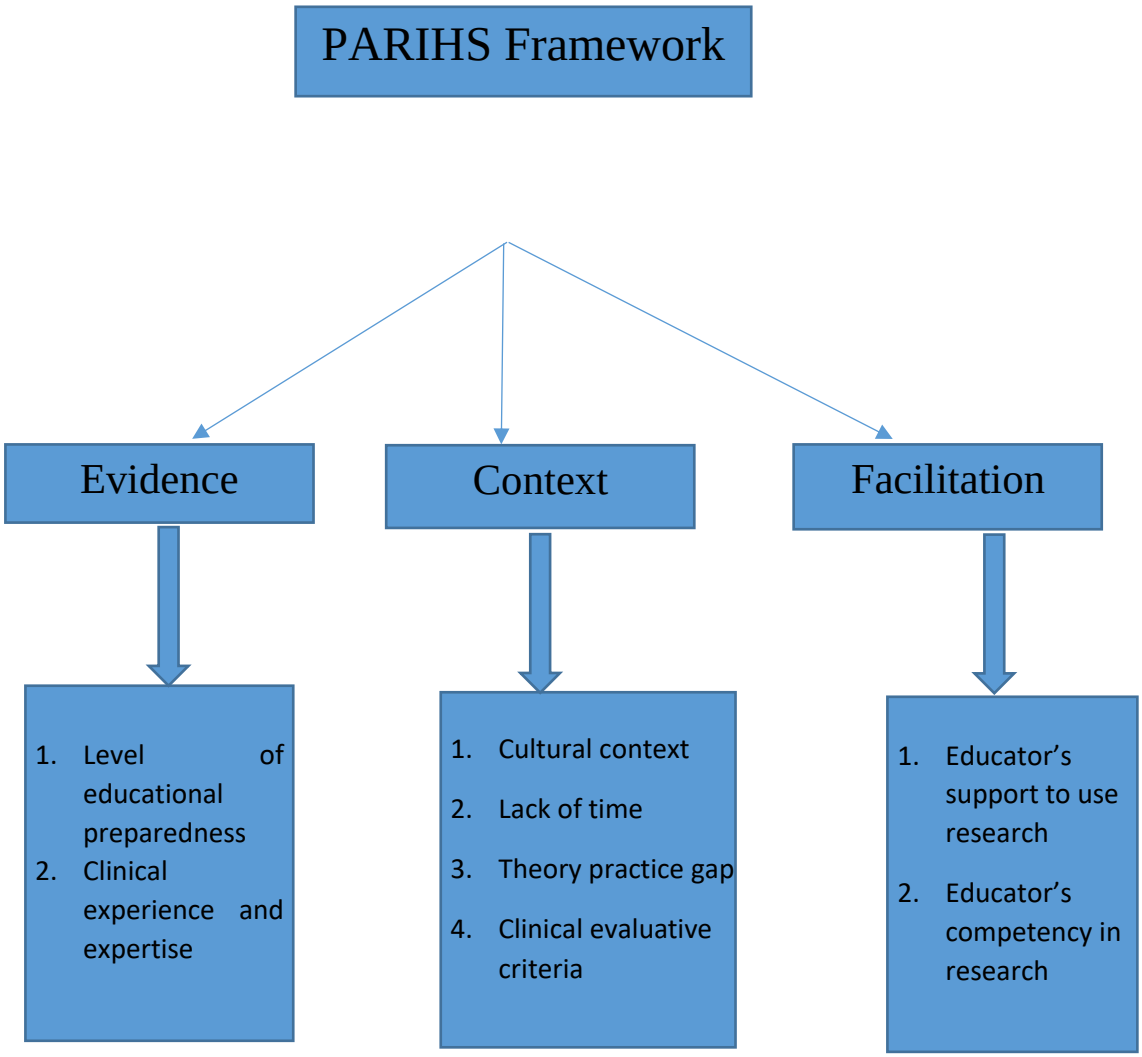

Figure 1: PARIHS Framework (Kitson, Harvey & McCormack, 1998; Rycroft-Malone, 2004).

Evidence

Evidence from research is considered knowledge when it is derived from a variety of sources, has been subjected to testing, and is considered credible (Rycroft-Malone et al., 2004). Moreover, research evidence can be translated and adapted if it is applicable to the local context and it makes sense (Rycroft-Malone et al., 2004). The PARIHS framework (Kitson et al., 1998) demonstrates that successful implementation is more likely to occur when research, clinical and patient experience are located in the high range of the model, which

includes, for example, research (qualitative or quantitative) that is well conceived and conducted and has achieved consensus (Stetler et al., 2011).

Context

In the PARIHS framework (Kitson et al., 1998), the term context refers to the environment or setting in which people receive healthcare services or the incorporation of research evidence into practice. (McCormack et al., 2002). In the framework the contextual factors that promote the successful implementation of evidence into practice are listed under three broad themes: culture, leadership, and evaluation (Stetler et al., 2011). Cultural context can be described as learning organizations that are more conducive to facilitating change because they create learning cultures that focus on individuals, group processes, organizational leadership and systems. In the PARIHS framework, Stetler et al. (2011) proposed that the characteristics of context are key to ensuring a more conducive environment to incorporate evidence into practice. More specifically, a strong context that includes, for example, clarity of roles, decentralized decision making, the valuing of staff, and transformational leaders who are capable in evaluating the aspects of the Context, increases the chances of successful implementation.

Facilitation

The third element, *facilitation*, is defined as "providing help and support to achieve a specific goal to enable individuals and teams to analyze, reflect, and change their own attitudes, behaviors and ways of working" (Harvey et al., 2002, p. 580). Stetler et al., (2006) add that facilitation is "a deliberate and valued process of interactive problem solving and support that occurs in the context of a recognized need for improvement and a supportive interpersonal relationship" (p. 6). There are three components of facilitation: the *purpose*, *role* and *skills and attributes* that contribute to successful implementation (McCormack et al., 2002; Rycroft-Malone et al., 2002; Rycroft-Malone, 2004). *Purpose* is considered a continuum ranging from task-oriented (specific goal attainment) to holistic-oriented (enabling individuals and teams to change their ways of working and attitudes through reflection). Within these two purposes, *role* and *skills and attributes* are described. For example, a facilitator's role would be to do for others using technical, marketing, or project management skills within the task-oriented side of the continuum and to enable others on the holistic-oriented side using critical reflection and co-counseling skills (Helfrich et al., 2010; Stetler et al., 2011). More recently, facilitation has been viewed as both an individual role and a process that involves both individuals and groups (Dogherty, Harrison, & Graham, 2010). Facilitation is growing as a method for encouraging RU in clinical practice, particularly in nursing (Dogherty, Harrison, Baker, & Graham, 2012). However, there is an increasing need to evaluate the outcomes of facilitation with respect to actions taken (Dogherty et al., 2010).

Each of these elements can be assessed based on whether they have a weak (low rating) or strong (high rating) effect on successful implementation (Rycroft-Malone, 2008). Given the nature and interconnection of these three elements, the effect of implementing an intervention may differ in various settings (Helfrich et al., 2010).

In this study, the PARIHS framework guided the establishment of the relationship between critical elements that are identified as key for successful RU and implementation. The questions for the interview were based on a broad conceptualization of the PARIHS framework. The framework guided the formulation of questions posed during the focus group interview, promote completeness of data collection by helping the researcher to examine/explore the factors that influence RU in practice. For the data analysis, the conceptual

domains from the framework were used to derive common attributes that study participants identified as barriers to or facilitators of RU in their practice setting.

Role of the Researchers

The first author, Salima Meherali (SM), is PhD Candidate. Her dissertation focuses on research utilization and critical thinking in undergraduate nursing students. Her study used a sequential mixed methods approach. This design consists of two distinct phases beginning with a quantitative phase followed by a qualitative phase for the purpose of exploring and extending the initial results in more depth. In the first phase of our study, quantitative, numeric data was collected using the California Critical Thinking Disposition Inventory (CCTDI), the latest version of Research Utilization (RU) Survey, and a background/demographic data questionnaire. The qualitative phase of the study focused on further exploring the results of the statistical tests, obtained in the first, quantitative phase. As the authors wanted to explore and understand the stated phenomenon of RU by undergraduate nursing students in its entirety, a qualitative descriptive design was used to address the study questions. In this paper, only the qualitative analysis related to research utilization is reported. The quantitative findings have been published elsewhere (Meherali, Profetto-McGrath, & Paul, 2015). The second and third authors, Drs. Pauline Paul and Joanne Profetto-McGrath, are professors in the Faculty where the study was conducted. They co-supervised and guided the first author during her entire doctoral research and guided her in the conduct of the study. Both have expertise in qualitative research. In qualitative research, the researcher is the instrument and unique researcher attributes have the potential to influence the collection of empirical materials (Pezalla, Pettigrew, & Miller-Day, 2012). The first author (SM), who conducted focus groups and individual interviews, is trained in qualitative research and various data collections strategies including semi-structured individual and focus group interviews.

In addition to ethics approval, administrative approval was obtained from the Faculty of Nursing to be able to invite undergraduate nursing students to participate in this study. Participation was voluntary and no incentives were provided, enabling the participating students to express their views freely during the interviews. Each student was informed about the background of the study and its purpose, was assured of confidentiality, and signed a consent form prior to being interviewed.

Methods

A qualitative descriptive design (Sandelowski, 2000, 2010) was used to address the study questions. According to Sandelowski (2000), qualitative descriptive studies belong to the "general tenets of naturalistic inquiry" (p. 337). However, unlike other categorical qualitative designs, such as phenomenology or ethnography, these tenets are "least encumbered by preexisting theoretical and philosophical commitments" (p. 337). At the outset of our research, in line with assumptions about naturalistic inquiry (Lincoln & Guba, 1985; Loiselle, Profetto-McGrath, Polit, & Beck, 2010), we believed that the students' behaviors toward and attitudes about using research in the learning context might be influenced by multiple factors, which could be understood from their comprehensive subjective accounts.

Sample

A purposive sample of 20 undergraduate nursing students enrolled in their final year of three BScN programs (four-year basic program, honors and after degree program) were recruited to participate in the study. Students from the four-year basic program enter the program having completed high school or some postsecondary courses. Concepts from nursing,

physical sciences, medical sciences, social sciences and humanities are introduced and integrated throughout the curriculum. Nursing practice occurs in various settings. The students in the honors program are high achieving students drawn from the four year basic program. In this program, they acquire more advanced preparation in scholarly and research work to enrich their undergraduate program experience. Students in the after-degree program are admitted on the basis of having completed a university degree in a field other than nursing which in many cases include completion of research courses from their respective prior programs. The curriculum of this program is designed to be completed over 23 months. A purposive sampling technique was adopted for this this study because it involved selecting those individuals whom the researchers believed were 'information rich' (Patton, 1990, p. 169) and could provide in-depth information about the phenomenon of interest (Creswell, 2013). Nursing students in the last year of their nursing program, who gave their consent, were able to reflect on their education, clinical experiences, and were willing to talk at length with the researchers were selected.

Data Collection

Semi-structured focus groups and individual interviews were conducted with a total 20 participants. Individual interviews were conducted when a participant was not able to attend a focus group due to conflicts with clinical rotations. Three focus group interviews with 5-7 participants in each group and three individual interviews were conducted. During the interviews and focus groups, we used a semi-structured interview guide comprised of open-ended questions guided by the PARIHS framework and aimed at eliciting the participants' perception of RU (Appendix A Interview guide). We/the authors developed a biographic questionnaire to gather background and demographic data. Each focus group lasted 60 to 75 minutes whereas individual interviews lasted 45-60 minutes; these were audiotaped with the participants' permission. Immediately after each interview (focus group or individual) field notes were recorded to capture the participants' nonverbal behaviors and emotions. In addition, a reflective journal was also maintained to record the overall process of data collection. The transcribed data was shared with five participants (1 participant from each focus group and 2 participants from individual interview) to ascertain whether the transcribed data accurately reflected their contribution.

Ethical Considerations

The study received ethics approval from the Ethics Review Board of the participating university and administrative approval from the nursing faculty to access the student population. Students were informed that participation in the study was completely voluntary. Those who participated were advised that they could leave the interviews at any time. Confidentiality was ensured through the use of code numbers and no names were used. Written informed consent was obtained from all participants. All data has remained anonymous. Students were apprised that the findings would be used in publications and presentations.

Data Analysis

The data collection and analysis occurred concurrently. The lead researcher transcribed, verbatim, each focus group and individual interview immediately after they were conducted. Thorne (2008) suggested that directly moving into the coding scheme might not be useful for an overall discovery of superficial findings; rather, he/she advised that researchers should deeply immerse themselves in the data by listening to the recordings of the participants'

interviews to gain insight (p. 14). For data analysis, SM first listened to the interview recordings to become fully immersed in the data. Second, she read and reread each transcript to gain an in-depth understanding of the overall picture of the phenomenon and to gain insight. Finally, a coding scheme was applied to the transcribed interviews to reveal categories, themes, and patterns. Subsequently, the categories with similar meanings were grouped into themes. Categories and themes were discussed with the two supervisors to ensure they best reflected the data. Themes and sub-themes were derived inductively, but the overall PARIHS framework was used to derive themes that study participants identified as barriers or facilitators of RU in their practice settings. We used NVivio 10 software for the analysis.

Measures for Trustworthiness

We used Lincoln and Guba's (1985) method of establishing trustworthiness to ensure credibility, dependability, confirmability and transferability. To ensure the credibility of the study, the first author was deeply involved with the data (e.g., transcribing, reading, and rereading the transcripts; conducting an inductive analysis) and maintained transparency while analyzing the data and fulfilling her role as researcher. The participants were interviewed to the point of data saturation (prolonged engagement) as per Lincoln and Guba (1985). Dependability was achieved through a dense description of the methodology used to conduct the study and gather the data. Such dense descriptions provide information that can be used to replicate the study replication and highlight its unique features so that they will be clear to readers (Krefting, 1991). Confirmability was ensured by an audit trail of the verbatim descriptions, categories and subcategories. The audit trail with field notes documented the research activities and thinking processes to provide evidence to support the confirmability of the findings. For this research study, the results may be transferable to other pre-licensure nursing programs. Demographic data about study participants, specific details about the RU, and reflective journal questions are provided so that readers may determine if the results are transferable to their respective settings.

Findings

A total of 20 baccalaureate nursing students participated in the study (four-year basic program =5, honors program = 2 and final year of the after degree program = 13). The majority of students were female (n = 17 or 85%), ranging in age between 22 and 30 years. All participants had completed a required nursing research course. Thirty percent of students indicated involvement in research projects; however, the majority (66.6%) of these participants indicated that their involvement in research had been as research participants. Only two participants reported that they had been engaged in actual research projects as research assistants (Table 1). The study findings have been categorized into the PARIHS framework's components of evidence, context and facilitation as follows.

Evidence

Participants agreed that nursing students in general tend to view evidence as equivalent to research. However, they also acknowledged that there is a difference between evidence and research. In their view, evidence is more than research findings and data: it can include patient feedback, and clinical observations and experiences. The major themes identified in this category were: level of educational preparedness to understand the evidence, clinical experience, and expertise to use research evidence.

Table 1: Demographic Data

Demographic Variables	Number of Participants (N =20)
Total number of participants in focus group	17
Total number of participants in individual interview	3
Number of participants from four-year basic program	5
Number of participants from honors program	2
Number of participants from accelerated program	13
Participants Age Range	20-30 years
Participants completed required nursing research course	20 (100%)
Number of participants Involved in Research Projects	6 (30%)
Number of participants involvement in research as research participants	4 (66.66%)
Number of participants engaged in actual research projects as research assistants	2 (33.33%)

Level of educational preparedness

The best-articulated definition of RU came from participant 1 in focus group 1. This participant defined RU as "the idea of the evidence informed decision making. It's kind of using the most current and new and proven information to guide the decisions*"*. The majority (17/20) of participants said that they didn't have the necessary knowledge and skills for RU. The Nursing Research" course is mandatory in the baccalaureate nursing curricula. Yet, after completing the research course, students felt ill prepared to skillfully critique research studies or to determine their potential use in professional practice. The following explanation was offered by a student in the after-degree program: "It is not as easy for us to base our practice on research findings; we need the appropriate education to recognize the necessary research process. A single course on research will not prepare us to understand and use research in practice" (Participant 4 in Focus group 1). The participants expressed the belief that RU requires more intensive and extensive research skills. However, according to one participant undergraduate programs don't help students to develop these skills. "The problem with

research utilization for a student is that most students don't understand how complex this is, because it's just really not taught" (Participant 3 in Focus group 3).

In contrast to the above belief, a participant in the honors program stated: "I am very fortunate … to have had a lot of experience in research, and as a result I am able to discern what is quality research, what is research that should be incorporated into clinical practice." (Participant in Individual Interview). Another participant from the same honors program shared: "I'm in the honors program, so research is a part of who we are and what we do…..it's the amount of exposure to research that is much more important. I see how research makes change and it makes people's lives better" (Participant 5 in Focus group 3). These statements point to the importance of how immersion into research impacts attitudes towards it. In general all the focus group participants concluded that RU education is one of the basic and important principles for providing *research-based care*. They also believe that effective research education leads to research-based practice.

Clinical experience and expertise

Educators who teach undergraduate nursing courses need to share with their students what to expect in a clinical setting and connect that to research-based knowledge. Participants in this study valued their accumulated practice experiences as nursing students. They viewed clinical practice experience as necessary to enable RU and a vital source of evidence for decision-making. As participant 4 in focus group 2 reported: *"*Experience is the best teacher and no matter what I read, the level of experience that I've had determines how much faith I put into what I read, how critical I am of what I read, and how comfortable I am applying that."

The participants also noted that lack of clinical experience during nursing education, lack of focus on continuing education in RU during the undergraduate nursing program and poor access to expert nurse educators leads to insufficient research use in clinical practice. As one focus group participant stated: *"*I think in general the more experience you have on a unit the more you have the opportunity to see things and then you can bring those experiences to seminars and lectures and link it to evidence based literature" (Participant 3 in Focus group 2).

Participants in this study valued their clinical experiences with expert clinical teachers. They commented that their clinical experiences gave them a critical lens from which to determine the utility of the research evidence to their particular patient or practice area. However, the majority of participants felt that they lacked confidence as to how to use research in practice. As one participant reflected, "students feel like they don't have the foundational knowledge to do that" (Participant during Individual Interview). Participants also regarded clinical nursing instructors as a source of support and guidance to understand evidence based practice. However, some of the participants in the focus groups and individual interviews reported that some of the clinical nursing instructors lack research skills and they are not supportive, particularly "because [they] lack expert knowledge….so if tutors [nursing instructors] are intimidating at all in the clinical setting we just shut up and try to do our best" (Participant 6 in Focus Group 1)

Context

The four sub-themes identified from the data analysis about context are organizational culture, lack of time, theory practice gap and evaluation of students' performance.

Cultural context

The structure and culture of the health care system were identified as important factors affecting students' utilization of research in clinical practice. Students considered "authority" as a pre-requisite in using research in clinical settings and as a critical factor in utilizing research to provide quality care and improve patient outcomes. One student said: "Hospitals have an impact on research use. There are units where you find lots of encouragement and there are units where you just keep quiet, don't get in their way and do not question what they are doing" (Participant 5 in Focus group 3).

Group dynamics were also identified as an important factor affecting whether nursing students embraced RU. As one participant said: "Hospital units where multidisciplinary healthcare teams work closely and have open communication foster RU among all health care providers. On the other hand, a lot of other units where lots of nursing research been done and we might even get a chance to get that information because of the dynamic of that group" (Participant 3 in Focus group 1). Participants reported that discussions with peers helped them express their views in a formal way, clarifying in their own minds how they had interpreted the research evidence and understood its potential application in practice. Consulting with peers or multidisciplinary team members required participants to be explicit about their decision-making. It also provided opportunities for students to evaluate the integration of new research evidence with respect to their personal practice theories, and to receive feedback on their proposed approaches. In summary, discussing clinical cases with others helped participants' and enhanced their abilities to integrate research into practice.

Lack of time

In many studies lack of time is cited as a significant hindrance to using research findings; therefore, findings about the lack of time in this study are not surprising. The participants mentioned that while in clinical practice there is no time allowed to go to the library to search and read relevant research papers. Participants also said that even if research papers were readily available in the clinical area, there was not enough time during working hours to access and read them. Two participants stated that because of the heavy workload, they felt too mentally exhausted to do any reading after the end of their clinical practice time. As one participant shared: "If I am tired, I don't bother to read up or think of work anymore. I go home and [I] just want to go to bed" (Participant 1 in Focus group 3). The majority of participants agreed that there should be protected time for students to search for and evaluate relevant research papers as well as discuss these during clinical pre/post conferences.

Theory practice gap

It is believed that the root of many problems in nursing is the wide gap between theory and practice. Participants in this study claimed that this gap leads to a lack of research use in practice settings. Participants believe that the gap between education and clinical practice affects RU. One participant stated that: "our academic education gives medical-centered theoretical knowledge from texts that are sometime not applicable in practice. I just feel like we do not actually apply all that we learn in theory classes" (Participant 3 in focus group 1). They highlighted what they saw as a lack of a professional relationship between the clinical nurse educator, clinical nurse specialist, and nurse researcher and identified this lack of relationship as one of the major reasons for the theory-practice gap. One participant suggested a solution: "It is necessary for the nurse clinicians and the faculties of nursing [nurse educators] at the various nursing schools to have some sort of communication as the relationship between

the two is important." Participants engaged in a lively dialogue about poor professional relationships among nurse-researchers and clinical nurse educators. One participant stated that: *"*In nursing education, the most recent up to date research findings are available to students. However, when they enter the clinical setting, sometime the up to date research information (clinical practice guidelines) are not available or not used by the practicing nurses. It is for this reason that it is difficult for us (students) to use updated evidence (research) learned in school into the clinical setting" (Participant 7 in Focus Group 1).

Clinical evaluation criteria

In this program students are evaluated using a standardized form that reflects the entry to practice professional competencies of registered nurses in this province. A student overall performance is assessed based on categories drawn from graduate competencies of the RN and academic year-end outcomes. Evaluation items fall under five categories: (1) professional responsibility and accountability, (2) knowledge based practice, (3) ethical practice, (4) service to public, and (5) self-regulation.

Clinical nurse educators who are responsible to evaluate nursing students' clinical performance don't take into consideration whether or how the students used research in their clinical postings. Therefore, students see little value in using research; if they're not being evaluated on it, it seems that it is not valued, even if it is one of the major components of the evaluation document. One participant stated: "research utilization is included in the nursing evaluation checklist. However, clinical educator[s] are not including it in their evaluation. I am assessed only in my patient notes (routine work), rather than in my research-based care plans for the patients I developed" (Participant 4 in Focus Group 2). The focus group participants also agreed that if RU is not incorporated in the evaluation guidelines, forms, et cetera, students' motivation to use research will decrease. Participant 6 in Focus group 1 summed it up best when he said "if the clinical evaluation doesn't include research; the message is that it doesn't matter whether or not students use it".

Facilitation

The participants reported that educators' support is a key facilitator of RU in the clinical setting. Educators' support for research and their competency in research are the sub-themes identified from our analysis.

Educators support to use research

Participants thought that being mentored impacted their abilities to integrate research into their practices. Mentoring serves as a catalyst for students to update their knowledge of current research and its impact on practice. As one participant stated; "[Nurse educators from the university] are expected to be very familiar with the literature that the students are reading so you are able to challenge them to critically appraise the literature and synthesize and apply the information to the case" (Participant in individual interview). Mentoring students demands articulation of knowledge, providing opportunities for students to acquire research evidence, and provides a forum to students to discuss the impact of research on practice. Nurse educators also facilitate reflective learning through questioning students' existing practices and inquiring about their clinical decision-making. Overall, the study participants valued mentorship because they believed that it enhanced their own learning by challenging them to explicate and defend their practice theories, and by providing opportunities to model research retrieval and discuss using it in practice.

Educators' competency in research

The majority of participants said that some nurse educators lacked the skills and knowledge necessary to facilitate students' use of the evidence in clinical settings and in providing patient care. As one focus group participant stated: I've never had a seminar where the educator shared research based knowledge in the seminar discussion. As facilitator[s] they are not knowledge[able] translator [s]; they were just leading the group but research isn't translated over" (Participant 1 in Focus Group 3). Participants also mentioned that nurse educators, particularly those in the clinical setting who work with students to increase research use, help them become more confident, interested and motivated. However, students reported that few nurse educators seem interested in guiding them in this area. As another focus group participant reported: "Our nurse educator in our medical/surgical clinical rotation almost refused to guide us. Even when we had questions related to client interventions she always said "well you have to figure it out" (Participant 5 in Focus group 2). Participants also believed that nurse educators should be trained to use evidence/research in teaching because nurse educators "who have strong research backing are more likely to bring it forward" (Participant 1 in Focus Group 2). Participants felt very strongly that the best way for them to gain RU knowledge was to be taught by nurse educators who are competent in the area.

Discussion

RU is essential in developing evidence-based practices (Polit & Beck, 2012). This study used the PARIHS framework elements of evidence, context and facilitation as the underlying theoretical structure (Stetler et al., 2011). Findings revealed that a range of different and multifaceted barriers negatively affect the RU process. Implementing research evidence involves many aspects and is often challenging (Helfrich et al., 2010). The findings from this study are similar to those of other studies regarding the extent to which nurses use research findings in practice as well as some of the barriers and facilitators relevant to RU. None of the study participants reported using research findings all the time to inform their practice, which was expected, although they were able to articulate a number of areas where they had based their practice on research. This result parallels that of Heikkila (2005) who found that RU was fair or poor among most nurses and nursing students, and that students' RU skills seemed to depend on the amount of RU instruction they had received. Participants in the current study also recognized that they lacked the skills and knowledge to use research evidence. Generally, the participants viewed their research skills as basic. Many believed that they lacked knowledge of the research process, which also hinders RU. From the participants' perspectives, having research knowledge plays an important role in enhancing their skills to evaluate and use research. These findings are supported by previous studies (Rodgers, 2000; Patiraki, Karlou, & Papadopoulou, 2004). To build their professional portfolios and be recognized as science-based providers, nurses need knowledge and skill in how to use research. With this knowledge and these skills come the power to change practice and benefit patient care (LaPierre, Ritchey, & Newhouse, 2004). Other authors have also found that students received inadequate educational preparation in research (Halabi & Hamdan-Mansour, 2010; Salsali & Mehrdad, 2009; Wangensteen, 2010). The participants in our study acknowledged that they needed further support to improve the quality of nursing care they were expected to deliver. Previous studies also identified that education is one of the main factors underpinning changes and that research training is a key for academic departments to increase research capability and capacity (Ellis, Howard, Larson, & Robertson, 2005; Wangesteen, 2010). Study participants also indicated that nursing students do not value nursing research, and are more task-oriented, which leads them to focus more on routine-based care. However, participants also said that they

valued research and believed that research-mindedness creates innovation in nursing practice; they also claimed that constructing a research-friendly culture through appropriate infrastructure promotes the use of research in practice. Meijers, Janssen, Cummings, Wallin, Estabrooks, and Halfens (2006) reported a statistically significant relationship between RU and the research climate (i.e., the environment in which research use is encouraged and recognized.

Exploring the concept of context is challenging because the amount of time students spend in clinical settings and their scope of practice are limited. They are placed in clinical environments where they are not in a position to make many independent decisions, to challenge the status quo, and/or ask questions in situations in which they feel the practice is inappropriate. An environment or context in which research findings are available and their implementation supported was found to be a significant predictor for research use (Wallin, 2009; Wangensteen, 2010). Nurses working in contexts marked by a positive culture, strong leadership, positive evaluation and/or performance feedback have reported significantly higher research use compared to those working in contexts lacking these elements (Cummings et al., 2007). Furthermore, Fink, Thompson and Bonnes (2005) concluded that creating environments that value research use is important for organizational success. It is well documented that in the nursing profession, environmental factors play an important role in research use.

Participants reported that a lack of time is a barrier to RU, a factor also cited in the literature (Andersson, Cederfjäll, Jylli, Nilsson Kajermo, & Klang, 2007; Gerrish & Clayton, 2004; Hutchinson & Johnston, 2004). Hutchinson and Johnston (2006) reported that nurses lack support from physicians, nurse colleagues, and other health-care staff, and that nurse leaders must take the initiative to create a culture of research use. Nurse educators play an important role in helping students to develop a positive attitude towards research and in creating situations in which students can use research findings in their practice.

In addition to the importance of a supportive cultural context, our study participants agreed that nurse educators should find a way to close the research practice gap. Cooperation between academic and clinical staff is one of the main drivers of the movement for research-based care. Some researchers confirm that collaborative exchanges between service and academia are essential and that there is obviously a real need for increased collaboration between researchers and clinical nurse educators willing to promote and support the use of research among nurses and students (Ajani & Moez, 2011; Engelke & Marshburn, 2006; Florin et al., 2012; Salsi & Meherdad, 2009).

There are still significant challenges in assisting students to overcome barriers and enhance their confidence and ability to read and use research in practice (Dobratz, 2003; Johnson et al., 2010; Meeker, Jones, & Flanagan, 2008). Developing nursing students is a key role of nurse educators who should not only provide support and encouragement in the clinical setting, but should also strive to implement research findings and/or support research-based practice. Rycroft-Malone et al. (2004) contend that a supportive context or environment and adequate facilitation are needed to achieve research-based practice. In contrast, Rogers (1995) found that perceived support, in general, was not associated with RU, but that actual support was significantly correlated with RU. Numerous studies have highlighted nurse educators' support or lack thereof when it comes to using research results (Halabi & Hamdan-Mansour, 2010; Wangensteen, 2010; Florin et al., 2012). Nurse educators should find creative and innovative teaching/learning strategies that stimulate and motivate students to understand how research relates to the real world of nursing (Mansour & Porter, 2008; Phillips & Bonsteel, 2010). The more interactive and experiential learning strategies nurse educators use to teach research, the more likely that students will be motivated to learn about research (Spires, Paul, Jennings, & Weaver, 2012). McCurry and Martins (2010) found that small group work and collaboration with clinical courses are perceived as more effective ways to teach research courses than traditional assignments, such as critiquing research articles, library orientations

on nursing databases and reading the textbook or listening to lectures by either faculty or clinical nurse researchers. Students need to be engaged in those very foundational activities that expose them to research language and structure in order to help, stimulate and inspire nursing students to continue to explore research (Irvine et al., 2008). These strategies help to engage students and foster their active participation in their own learning. Nurse educators could act as change agents and facilitate nursing research by helping students and staff nurses to develop ways of implementing research findings, a strategy previously confirmed by Engelke and Marshburn (2006).

In addition, nursing research courses and concepts should be introduced into the curriculum as early as possible, since such courses and concepts improve students' positive attitudes toward nursing research. Early and extensive introduction to research can help to promote and encourage an appreciation for the discovery of new knowledge and its applications to practice. It is also recommended that students receive support and encouragement to use research findings, and read and critique scientific publications recommended by their educators. The nursing curriculum might need to be restructured to emphasize the importance of RU and incorporate content specific to RU theories (Spires, Paul, Jennings, & Weaver, 2012).

Undergraduate honors nursing programs offered by some universities expose students to research throughout the duration of the program (Honors Program, 2016). Such programs give outstanding students the opportunity to create scholarly work and help them to use research in practice. This early and in-depth research exposure is more extensive than what occurs in traditional baccalaureate programs, and thus may better prepare students to use research during their nursing careers and foster readiness for graduate study. Faculties and schools of nursing should facilitate such programs as these are essential to the growth of the profession. Moreover, a useful strategy would be to develop specific education programs that target the skills needed for facilitation as outlined by the PARIHS framework. Such a strategy would enhance a clinical nurse educator's ability to use research effectively in clinical teaching. Collaborative mentorship programs between researchers and clinical nurse educators need to be established to enhance awareness of the research process and involvement in research activities. In addition, preceptorship education should also incorporate RU content for registered nurses mentoring students in the clinical setting. It may also be important to further examine the extent to which clinical educators pay or do not pay attention to RU when evaluating students. If RU is not often evaluated it will be critical to provide support to clinical faculty to ensure that they are prepared to undertake such evaluation and provide mentoring to students in this area.

Conclusion

Nursing students are expected to use research in their clinical practice and thus it is important to foster RU skills among nursing students not only in nursing research theory courses, but also in practice settings where RU's impact can be observed. This study adds to existing knowledge by exploring students' perceptions about RU. The findings of this study helped us to reach a better understanding of the factors influencing nursing students' RU. Our findings suggest that it is possible to modify several of those factors, thus improving the situation. Our study also provides new knowledge about the factors associated with nursing students' low RU. The transition from nursing student to a professional nursing role requires in part that students are well-equipped with research-based knowledge and skills. An increased focus on curriculum necessary to improve the likelihood of early interventions aimed at increasing nursing students' RU and optimizing research-based care in health care facilities.

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Appendix A: Interview Guide

- What is your understanding of RU?
- Do you think RU are important in nursing?
- To what extent do you use research findings in practice?
- What are some examples where you have used research to inform your practice?
- What barriers did you experience that have prevented you and your colleagues from using research findings further in order to inform their practice?
- What are some strategies which would have enable yourself and your colleagues to increase the use of research findings in practice?

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