Nurse Educators' Perceptions of Ecoliteracy in Undergraduate Nursing Programs

by

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ABSTRACT

Knowledge about the relationship between human health and the environment is continuously expanding. Nurses are well positioned to address environmental and ecological health concerns related to human health. Yet, there is evidence that nurses' lack of environmental health training is a barrier to incorporating environmental health concepts into practice. The purpose of this descriptive qualitative research study was to explore and describe nurse educators' perceptions of ecoliteracy in undergraduate nursing programs within the province of Manitoba. Semi-structured telephone interviews were utilized to collect data from 13 nurse educators in three regions of Manitoba. Thematic content analysis identified seven themes. A key finding is that, while nurse educators feel that ecoliteracy is important for nurses at the undergraduate level, there are many challenges to achieving ecoliteracy within undergraduate nursing programs in Manitoba. Potential strategies for overcoming these barriers and recommendations for increasing ecoliteracy among nurse educators are identified.

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CHAPTER ONE – Background

Personal Experience and Passion for the Environment

Since childhood I recall having an interest in the environment, and have fond memories of exploring the great outdoors as a child and into young adulthood. This passion has carried over into my professional endeavours and fueled an interest in the topic of environmental health as it relates to nursing practice and human health. It was around this time that I found an advertisement in the *Canadian Nurse* magazine, looking for volunteers for an Environmental Health working group formed by the Canadian Nurses Association. This proved to be a great opportunity for me to grow professionally and to share a passion with other like-minded individuals. The working group grew into the special interest group, Canadian Nurses for Health and the Environment. Over the years I have held various positions on the Executive board, including my current role as President.

Identifying the Research Issue of Interest

With an increasing amount of evidence demonstrating a relationship between human health and environmental health, it can be inferred health care providers including nurses will require an expanded body of knowledge to address the related human health concerns (Bentley, 2013; Institute for the Future, 2007; NurseONE, 2013). Analysis of the literature indicates that nurses' lack of environmental health training is a barrier to incorporating environmental health concepts into practice (Canadian Nurses Association [CNA],2009; Hewitt, Candek & Engel, 2006; Hill, Butterfield & Kuntz, 2010; Tinker, Postma & Butterfield, 2010; VanDongen, 2002), inhibiting their ability to address the environment as a determinant of health. This data coincides with literature identifying that environmental health concepts taught in nursing programs at the undergraduate level are lacking (Gerber & McGuire, 2010). Barna, Goodman, and Mortimer

(2012) recognize the need for the inclusion of basic concepts connecting the natural environment and human health within undergraduate nursing programs to support literacy amongst our future nurse leaders. The deficiency in environmental health knowledge noted within the nursing profession further validates the need for undergraduate curriculums to be inclusive of content relating to the environmental determinants of health (Anderko & Koepsel, 2009).

Purpose of the Study

The purpose of this research is to identify undergraduate nursing faculty members' perceptions about ecoliteracy and its application to nursing education. Acquiring greater understanding of ecological determinants of health in undergraduate nursing programs is of the utmost importance as "the nursing curriculum provides the foundation for considering environmental factors as contributors to impaired health" (Kirychuck & Koehncke, 2012, p. 384).

Environment, Ecosystem & Ecological Health: What is the Difference?

The current discourse involving the concepts of environmental health, ecosystem health, and ecological health is ambiguous. The concepts are broad, and numerous disciplines are required to address the complex issue; as a result, meanings can vary slightly in the literature and distort the current lexicon (Castle, 2000). Within the profession of nursing Lausteen (2006) recognized the dearth of semantic clarity surrounding the concept of environmental health and suggested the term ecosystem as an alternative within the profession. Further to this, Howard (2005) links ecosystem health and the environment describing it as a systematic approach identifying a complex relationship between ecosystems and human health. It is accepted that "within ecological science, the term ecosystem addresses the dynamic, interacting, and relational nature of organisms and their environment" where the "ecosystem…embraces the circularity of

influence and causation, creating a web of interrelationships among and between the environment and all of the inhabiting organisms" (Lausteen, 2006, p.44). Castle (2000) concludes, "an inclusive definition of ecosystem-human health cannot contain a single set of norms but instead must rely on the analysis of the interactions between humans and ecosystems" (p.154). Furthermore, it is recognized that human health is dependent on the following ecological determinants of health: oxygen, water, and food. Additional ecological processes important for health include: protection from UV radiation, nitrogen and phosphorous cycles, detoxification of waste products through natural processes, as well as abundant soil and fresh water to support vegetation and food (Canadian Public Health Association [CPHA], 2015). This paper will use the terms environmental health, ecosystem health, and ecological health interchangeably due to the semantic ambiguity that exists.

Significance of the Phenomenon to Nursing

Potential for involvement from the nursing profession is multidimensional in addressing environmental determinants of health. Nursing professionals have the potential to interact with clients addressing environmental health in homes, schools, offices, and daycares (Kirchuck & Koehncke, 2012) with particular emphasis in public health/community health settings (Hill, et al., 2010). As well, there is increasing literature to support the role of nurses in tertiary care settings in addressing environmental health concerns. Nurses in the tertiary care setting might be involved in mitigation and adaptation activities including greening the health care system, addressing climate change, providing education, and advocating for change (CNA, 2017a).

There has been formal recognition by provincial, territorial, and federal Ministers of Health in Canada that illness prevention, health promotion and education initiatives are imperative to a sustainable health care system (Public Health Agency of Canada [PHAC], n.d). The Lalonde

Report: *A New Perspective on Public Health of Canadians a Working Document* (1974) initiated a shift from a biomedical model to a health promotion model–a model that first recognized the environment as a determinant of health. About a decade later the *Ottawa Charter for Health Promotion* (World Health Organization [WHO], 1986) broadened the link between the health of individuals and communities to the physical environment, recognizing the importance of ecosystem sustainability, and suggesting a socio-ecological approach to health promotion be upheld, leading to an Integrated Model of Population Health and Health Promotion (PHAC, 2001).

Since the mid-1990s, two frameworks have been commonly utilized to address the determinants of population health: The Population Health Promotion Model and the Population Health Framework (PHAC, 2013). Neither of these frameworks use the proactive 'ecosystem sustainability' language of the Ottawa Charter, however, both recognize the physical and built environment as a determinant of health. An example of the physical environment's influence on one's health is the connection made between childhood asthma and airborne contaminants or excessive UV-B radiation, to common disease processes such as skin cancer and immune system depression. The built environment, considered a component of the physical environment, takes into consideration the health effects related to housing, indoor air quality, transportation systems and community design.

For the purpose of this paper "environment" refers to both the physical and built environment. Lead, pesticides, mercury, solvents, asbestos, and radon are environmental hazards with the ability to influence health and are linked to the social determinants of health (Stanhope, Lancaster, Jessup-Falcioni & Viverais – Dresler, 2011). Air quality, water quality, and greenhouse gas emissions (to name a few) are environmental indicators with a probable link to

human health (Kirychuk & Koehcke, 2012). According to the CPHA (2015) *Global Change and Public Health: Addressing the Ecological Determinants of Health* the benefits of applying a sustainability lens at the public policy level surrounding discussions related to urban design and transportation, energy, agriculture and food would result in healthier communities. Three emerging threats linked to ecosystem health which are also linked to equity have been identified as "ecological degradation, climate change, and peak oil" (Poland, Dooris, Haluza-Delay, 2011) in addition to water shortages (Bentley, 2013). Consideration must now be given to the term ecological determinants of health as an expanded definition of the term environmental determinants of health. Both environmental determinants of health and ecological determinants of health will be used throughout the paper.

Over the last decade, the emphasis in public health has shifted towards the social determinants of health (Raphael, 2009; Mikkonen & Raphael, 2010) and the environment as a determinant of health has been given less consideration. Disease burden attributed to environmental causes is not equally distributed and has been recognized as a social justice issue, in Canada and internationally, supporting the need for an environmental health justice movement (Masuda, Poland, and Baxter, 2010). Socially disadvantaged children, older adults and those living in poverty experience greater health effects related to the environment as opposed to more affluent members of society (WHO, 2006). A discussion paper by the CPHA (2015), not only identifies the environment as a determinant of health but also discusses ecosystem sustainability as a health indicator. It suggests an "Ecosocial" framework for public health action, an approach that recognizes the interconnectedness of the social and ecological determinants of health and the influence on the health of individuals, communities, and populations.

The question remains whether current Population Health and Health Promotion efforts have the ability to support "ecosystem sustainability" as outlined in the Ottawa Charter. Do the efforts address "the protection of the natural and built environments and the conservation of natural resources [that] must be addressed in any health promotion strategy" (WHO, 1986)? Some Canadian health researchers are suggesting the need for change in order to address the complex health promotion needs associated with an ecosystem approach to health (Hansen-Ketchum, Marck & Ruetter, 2009; Waltner-Toews, 2009; Masuda, et al., 2010; Parkes, 2010; Webb, et al., 2010; Arya, et al. 2012).

Importance of Ecoliteracy. For all of the above-mentioned reasons, 'ecoliteracy' is an important area of knowledge for nurses today, and will likely be even more so in the future. Literacy is a concept related to that of education and has evolved since its emergence in the late 8th century (McBride, Brewer, Berkowitz & Borrie, 2013). Developing from the concept of literacy, with a closer relationship to health, is the notion of health literacy. Nutbeam (2000) views health literacy as more than the ability to read and write. Health literacy provides an individual with the capacity to use information as a form of empowerment. Ecoliteracy, known as the ability to apply the concepts of sustainability to communities, requires that nurses understand the organization and evolution of ecosystems (Capra, 2007). There are individuals involved in higher education who believe a shift in thinking from biology to ecology is required for the inclusion of sustainability content into curricula development (Capra, 2007; Haigh, 2007; Davis & Cooke, 2007). The shift in thinking requires academics and learners to acquire new knowledge and ways of thinking: ecoliteracy is the knowledge required to understand and apply the principles of ecology (Capra, 2009).

Large numbers of baccalaureate prepared nurses in the workforce provide strength to the argument supporting the need for inclusion of content supporting ecoliteracy in undergraduate nursing programs. In addition, it is recognized that nurses have the potential to address environmental health concerns within their current positions (McGuire & Gerber, 2010) providing reason to increase the environmental health concepts in undergraduate nursing curricula (Anderako & Koepsel, 2009; Harris, Pisa, Taligoga, & Vezeau, 2009). Despite nurses' potential to address environmental health, studies suggest nurses are not prepared to address the environmental health issues they face in practice (CNA, 2009; Elison-Bowers, Otterness, & Pritchard, 2011; VanDongen, 2002).

Future health care providers will require an ever-increasing understanding of the concepts associated with ecological determinants of health. Furthermore, health care providers will require the ability to apply sustainability concepts and recognize the complex relationship environmental determinants of health have to social justice issues (NurseONE, 2013). For this reason, a greater emphasis on the negative health effects related to ecosystems ought to be included in undergraduate nursing programs, and ecoliteracy provides a potential framework for its integration. The consideration of ecoliteracy as an underlying framework in undergraduate nursing programs requires exploration as it has the capacity to address the complex socio-political influences on health, which relate to environmental health concepts (Dixon, Hendrickson, Ercolano, Quakenbush & Dixon, 2009; Goodman, 2013; Hewitt et al., 2006; McGuire & Gerber, 2010). With growing human health and equity concerns attributed to ecological determinants of health, there is recognition that the environments in which we reside are a health indicator (Fraser, 2004; Masuda, Zupancic, Poland, & Cole, 2008).

Chapter Summary

The relevance of ecoliteracy to nursing practice is well justified. Nursing as a profession has the capacity to support human health needs associated with the disease burden attributed to environmental causation. Having identified a relationship between social and environmental determinants of health, health care providers will require the knowledge and skills to apply concepts in a manner that is equitable amongst health care consumers at various levels of the health care system. With growing concerns related to global warming, climate change and additional ecological health concerns, it can be inferred that all health care providers will require some degree of ecoliteracy to support the health of Canadians into the future.

CHAPTER TWO - Literature Review

The literature collected and analyzed for the review was accessed from online databases including SAGE, Oxford Journals, ERIC, Wiley, Elsevier, Pubmed Central, Medline & Gale. Key search terms were: environmental health OR ecological health OR ecosystem health, AND undergraduate nursing education OR undergraduate nursing curricula AND ecoliteracy OR ecological literacy OR environmental literacy. Only English language, peer reviewed articles, published between 2005 and 2017 were reviewed. During the review of literature snowball referencing was used, meaning that, on the occasion an article with information relevant to the thesis topic was found and was not included in the original search returns it would be included in the literature review. In order to gather pertinent information from relevant non-governmental organization websites a Google search was also completed. It is of particular interest to the researcher that a scant amount of literature related to the topic of interest was published between the start of the research project and its completion date. This further elucidates that the topic of interest is an emerging area with opportunity for further research.

Several key themes emerged from a review of the literature: semantic ambiguity related to environmental/ecological health; the concept of ecoliteracy and its use as a framework for teaching, learning and applying concepts relevant to the ecological determinants of health; international, national and local standards of practice for registered nurses associated with environmental determinants of health; and environmental health concepts that ought to be included in undergraduate nursing programs. These themes are discussed in more detail below.

Ecoliteracy' as a Framework for Exploring Issues Related to Environmental Health

In the literature, various terms with similar meanings are used when referring to the knowledge and understanding of ecological principles. Environmental literacy, ecological literacy and ecoliteracy are common terms with slightly different meanings (McBride et al. 2013)

(Appendix A). Environmental health literacy is a concept that is currently evolving. It is inferred that, with greater understanding of environmental health concepts, the result will be improved health outcomes for individuals and communities (Finn & O'Fallon, 2017). For the purpose of this paper the term ecoliteracy is used as it addresses social equity and ecological sustainability. The term, ecoliteracy, was originally published 27 years ago, evolving from the term environmental literacy, first used 45 years ago (McBride, et al., 2013). Ecoliteracy, grounded in systems thinking, views relationships as endless. From a qualitative perspective, mapping relationships between systems is important to learning the interconnectedness of ecosystems (Capra, 2009). The term ecological literacy, coined by David Orr and Fritjof Capra in the 1990's and similar to ecoliteracy, recognizes natural human systems are interdependent, and that human actions influence the natural world. Ecoliteracy provides students not only with the knowledge but also with the competencies required to address complex ecological concerns in a collaborative way. Ecoliteracy provides students the ability to integrate concepts of sustainability into professional practice issues promoting an ecocentric professional (Goleman, Bennet & Barlow, 2012). The key components of ecoliteracy frameworks address; affect, ecological and socio-political knowledge, knowledge of environmental issues, cognitive skills, and environmentally responsible behaviors (McBride, et al., 2013). Ecoliteracy is more than having the knowledge required to identify and list components of the environment, it is the ability to participate in informed decision-making (Locke, Russo & Montoya, 2013). According to Feeg (2009):

> General awareness of the relationship between the environment and human life is the base of the educational process. Building upon this base, the steps overlap in real life but can be integrated into the curriculum. Knowledge and understanding of human systems is critical,

> but not sufficient as attitudes of appreciation and a concern for the environment must be shaped. (p. 170)

Ecoliteracy encompasses components from ecological, democratic, and social justice approaches that apply in various contexts. An ecoliteracy framework in higher education seeks to instill a value system upon its students, promoting equitable sustainability (Goodman, 2010; McBride et al., 2013) to address the social justice concerns linked to ecological health. Through engagement of stakeholders and decision makers at various levels, the momentum required to produce change is possible. Higher education is able to provide leadership through the inclusion of content that supports ecoliteracy within its various programs. Institutions act as an advocate for change, leveraging support within industry and shaping the minds of future leaders, stakeholders and policy makers (Orme & Dooris, 2010). Advocacy for change must come from current generations and our future workforce, whom can acquire the knowledge and skills required through education for application in practice. An ecoliteracy framework has the ability to support the integration of ecological health principles related to sustainability and social justice within undergraduate nursing programs.

Ecoliteracy Standards of Practice/Competencies for Entry-Level Nurses

At present, the role of the Registered Nurse (RN) to varying degrees includes components linked to addressing environmental determinants of health. The reference made to a RN's role concerning environmental health in the *Framework for Registered Nurses in Canada* is a statement that RNs' worldview is broad--including person or client, health, the environment and nursing--taking into consideration the biophysical and environmental influences on health (Kozier, cited in CNA, 2007a). The CNA *Code of Ethics* document (2017b) reflects changes currently affecting health care providers as well as those that are already underway and is used

by nurses in ethical decision making. Included within the *Code of Ethics* is a statement that identifies global ethical concerns as they relate to health and well-being-- "supporting environmental preservation and restoration while advocating for initiatives that reduce environmentally harmful practices in order to promote health and well-being" (p.18)-- that identifies environmental preservation and restoration as a current issue for the nursing profession.

O'Fallon (2006) identifies various settings where nurses have the potential to interact with clients and where ecoliteracy would be required: "home, work, school, neighborhood, hospital, and clinic…. they deliver and communicate health information on environmental exposures such as indoor air pollution, water contamination, lead, mold, and pesticides, and adverse health outcomes such as asthma, autism, and Parkinson's disease" (p. 379).

RNs have the potential to bridge the gap between primary care and tertiary care. The following is an example from a case study (Harris as cited in Sattler & Davis, 2008) highlighting the involvement of RNs in the care of a client with potential environmental exposures. The public health nurses joined with an emergency department to provide follow-up care for a child admitted to the emergency department following asthmatic events. The emergency department nurses were able to identify the "at risk" group who would qualify for follow up care. Follow up care provided by a public health nurse included several activities: assessing the child's home for environmental triggers to asthma; assessing the parents'/guardians' understanding of asthma and associated medications and medical devices; and providing a care plan when necessary. The study noted the liaison between the tertiary care facility and public health resulted in decreased visits to emergency departments. Further to this, Goodman (2013) suggests nurses working within the tertiary health care system might take into consideration sustainability concepts such

as resource use and procurement such as buying and wasting less. With an understanding of ecological health concepts nurses are able to guide clients to protect and promote health-reducing exposure to ecological hazards (Dixon et al., 2009). When envisioning the future educational requirements of RNs, in terms of ecological determinants of health, role expansion from public and community health nurses into the tertiary care facilities should be considered (Harris et al., 2009).

Environmental health competencies and the role of the nurse or nursing scope of practice have the ability to influence standards of practice. Standards of practice are important as they guide education and practice for nurses and provide academics with a framework to design curricula. At international, national, and local levels, standards of practice related to environmental determinants of health exist to varying degrees. Current literature outlining the standards of practice for registered nurses outside of public/community health is scarce (Gerber & McGuire, 2010).

International recommendations for practice. The International Council of Nurses has published two position statements strongly supporting the involvement of nurses in addressing various environmental health issues. *Nurses Climate Change and Health* (2008) acknowledges "climate change as an important issue for the nursing profession, particularly in light of the impact on people's health and nursing's shared responsibility to sustain and protect the natural environment from depletion, pollution, degradation and destruction" (p.1). *Health Care Waste- The Role of Nurses and Nursing* (2010) states that "all nurses have a duty to reduce/eliminate the negative impact of health care wastes on individuals, communities, and the environment" (p.1). The Royal College of Nursing in the United Kingdom (2014) recognizes the relationship that

exists between the environment and global health and encourages nursing professionals to become engaged in activities supporting sustainability in the workplace.

National recommendations for practice. The Canadian Nurses Association has four position statements linked to nursing practice and environmental health: *Climate Change and Health (2017a)*: *Environmentally Responsible Activity in the Health-Care Sector (2009)*: *Nurses and Environmental Health (2017c)*: *and Towards an Environmentally Responsible Canadian Health Sector (2009)*. All four of the position statements support the need for an ecoliterate nursing workforce. The CNA (2017c) position statement Nurses and Environmental Health has outlined a nurse's role in environmental health as;

- Assessing and communicating risks of environmental hazards to individuals, families and communities;
- Educating patients, families and communities about environmental health and how to address key environmental health issues;
- Showing leadership in personal practices that can support and reduce harm to the environment;
- Collaborating with interdisciplinary colleagues to identify and mitigate environmental health risks in practice environments;
- Advocating for policies that protect health by preventing exposure to those hazards and promoting sustainability;
- Producing nursing science, including interdisciplinary research, related to environmental health issues;
- Promoting the development of natural and built environments that support health.

According to the CPHA (2010), roles and activities of the community/public health nurse in Canada specific to the environment include understanding that health is a basic resource influenced by many factors, including the physical and social environments. In terms of health promotion, a nurse's role is to encourage the adoption of health beliefs, attitudes, and behaviors addressing environmental and socio-economic determinants of health. Health protection requires the community/public health nurse to collaborate ensuring safe water, air, and food, control infectious disease and provide protection from environmental threats. The role may include risk communication to manage and control health concerns related to the environment (CPHA, 2010).

The Community Health Nurses of Canada (CHNC) includes the environment in its standards of practice identifying the role of the nurse is to provide prevention and protection services at various levels of the health system. The CNHC includes within its definition of environmental determinants of health chemical and biological hazards; air quality; water and soil quality; occupational risks; hygiene and sanitation; built environments, road conditions, noise and manmade climate and ecosystem changes (CHNC, 2011). Literature from the Association of Community Health Nursing Educators in the United States of America (2009), provides the following recommendations in terms of basic competencies for entry-level nurses related to environmental health:

- Identifies populations at risk for exposure to environmental hazards
- Conducts community, work place, and home environmental assessment
- Describes principles of risk communication as applied to environmental health
- Includes environmental risk questions in health histories of individuals and families
- Recognizes environmental justice that ensures protection from environmental hazards

• Incorporates environmental health information …into assessment of communities and populations

• Accesses information on national biomonitoring of human exposure to environmental chemicals.

• Recognizes the link between environmental exposures including those associated with air, water, food/agriculture, and chemicals/products.

• Makes referrals to appropriate environmental health resources in the community

• Educate individuals, families, communities, and populations about environmental health and safety issues (p. 12).

Local recommendations for practice. The College of Registered Nursing of Manitoba [CRNM] (2012) includes the following statement in their entry-to-practice requirements under professional accountability and responsibility: a nurse "recognizes and takes initiative to support environmentally-responsible practice (e.g., observing safe waste disposal methods, using energy as efficiently as possible and recycling plastic containers and other recyclable materials)" (p. 6). The entry-level competencies document is developed to assist with nursing education program approval and serves as a guide in curriculum development (CRNM, 2012). The CRNM's standard of practice document does not have a statement addressing the environmental determinants of health or the key concepts required on behalf of the nursing profession.

What do we know about Ecoliteracy in Undergraduate Nursing Programs?

A review of literature suggests concepts related to environmental health and ecological health are to varying degrees incorporated within undergraduate nursing programs, and that the main themes for educating nurses in environmental health concepts are evident; however further education is required (CNA, 2007b; CNA, 2009; Fraser, 2004). Gerber and McGuire (2010)

recognize that in general, current "nursing education does not adequately prepare nurses to understand the impact of the environment on health or to implement environmental health interventions" (p. 69). Literature infers a greater need for the education of health care professionals including nurses concerning environmental health concepts that have the potential to influence human health (CNA, 2009; Truckner, 2009).

Literature specific to the inclusion of environmental health content within undergraduate nursing programs in North America is limited. Sweeney and de Peyster (2005) recognize that "while much support exists for the inclusion of environmental health in nursing curricula, few nursing programs report on the actual integration process" (p. 440). Hewitt et al., (2006) found that in the United States "students at the undergraduate level have a good foundation to understand and apply environmental health concepts…content, whether presented as a standalone lecture with readings, or as a full course have been well received by students" (p.9). The courses where environmental health concepts have been considered for integration into existing curriculum in American programs include: Physical Assessment/Nursing Diagnosis; Introduction to Nursing Concepts/Nursing Process; Medical-Surgical Nursing; Pediatric/Maternity & Child Health & Families; Mental Health; Research; Community Health; and Leadership & Management (Institute of Medicine CEECNP cited in Gerber & McGuire, 2010).

In the United States, one college developed six learning modules that included basic and advanced nursing strategies related to environmental health concepts (Sweeney & de Peyster, 2005). The modules contained vocabulary, objectives, content, learning activities, as well as teaching and learning methodologies. Recommendations for content delivery include didactic content, in class, and an experiential clinical component, requiring students to participate in a

community placement. Heavily emphasized is the need for a multidisciplinary clinical site visit or hands on experience to achieve higher order thinking and to develop one's self efficacy in addressing the environment as a determinant of health (Hays, Davis & Miranda, 2006; Sweeney & de Peyster, 2005). Readings, review of local newspapers to identify an environmental health issue, group discussion to address national and global health issues, and risk appraisal questionnaires are also recommended (Gerber & McGuire, 2010). In some facilities, an online component to support the integration of environmental health content into courses has been useful (Savell & Sattler, 2012). The literature search did not reveal any information specific to environmental health curricula in Canadian nursing programs.

Chapter Summary

The body of knowledge surrounding ecoliteracy in undergraduate nursing programs is sparse, certainly at a local level, but also at national and international levels. Although the literature speaks to the need for ecoliteracy in post-secondary education, little to no empirical evidence exists about Canadian nurse educators' perceptions about ecoliteracy in undergraduate nursing programs. Exploring nurse educators' perceptions of ecoliteracy will provide an understanding of current practice and perhaps directions for improving ecoliteracy of the future nursing workforce. Increasing ecoliteracy in nurse educators and the future nursing workforce can improve the provision of health protection, prevention and promotion information to clients and increase participation in risk reduction initiatives in communities (Dixon et al., 2009). Additionally, increasing ecoliteracy in undergraduate nursing programs has the potential to bridge the gap in care between tertiary and primary care facilities. A nursing curriculum that incorporates a sustainability lens will require faculty to re-examine values, assumptions, and philosophies that guide our current practice (Goodman & East, 2013).

CHAPTER THREE - Methodology

Research Objectives

The objectives of this study were to explore:

(i) nurse educators' understanding of the concept of ecoliteracy, and its relevance to nursing practice.

(ii) nurse educators' perceptions about how ecoliteracy concepts are currently delivered and evaluated in undergraduate nursing programs.

(iii) nurse educators' perceptions about the barriers and facilitators to the inclusion of content which supports ecoliteracy in undergraduate nursing curricula.

Research Design

Ecoliteracy within undergraduate nursing programs is a relatively new concept. To date there is no empirical evidence exploring nurse educators' perceptions of ecoliteracy in undergraduate nursing programs in Canada. A descriptive qualitative research study was used to explore the phenomenon of ecoliteracy within undergraduate nursing programs in Manitoba, from the perspective of nurse educators. The use of a descriptive qualitative research method is appropriate when little information is available about the subject and detailed descriptions of a phenomenon are required (Neergaard, Olesen, Andersen, and Sondergaard, 2009). According to Sandelowski (2000), descriptive qualitative research provides a summary of individuals' perceptions of events and allows for the discovery of problems embedded within the phenomenon considered. Keele (2011) posits, "descriptive studies are designed to gain more information about characteristics of a topic of interest" (p. 38). Qualitative description as a method is a pragmatic approach to research with no strong philosophical ties to other qualitative approaches (phenomenology, grounded theory, ethnography or a narrative study). Qualitative

description provides a “rich description” of participant’s experiences using language similar to that of the participant (Neergaard et al., 2009). Discovering how nurse educators in Manitoba perceive ecoliteracy, and having them describe their experience, will result in an increased understanding of the phenomenon of ecoliteracy in undergraduate nursing programs in this province.

Characteristics of the Sample

The population of interest for this study is nursing educators from undergraduate nursing programs in Manitoba who meet the inclusion criteria stated below. Sandelowski (2000) and Neergaard, et al., (2009) identify purposeful sampling as appropriate for qualitative descriptive studies as it has the ability to provide information-rich sources. Purposeful sample selection in qualitative research occurs when subjects who possess the characteristics required for the study, or who have experience with, or are involved in, the phenomenon of interest, are chosen as participants (Houser, 2008; Streubert & Carpenter, 2011). Thirteen nurse educators participated in an interview, with a respectable distribution of participants between academic sites. Three levels of purposeful sampling were used: (i) purposeful selection of three university undergraduate nursing programs in each of three geographic regions of the province in order to capture different perspectives: Large Urban; Small Urban; and Northern; (ii) purposeful selection of individual participants at each study site; and (iii) ‘snowball’ sampling to recruit additional participants. The data for the study was collected over a seven-month time frame.

According to Houser (2008) specific criteria used during the selection process of a qualitative research study can assist to reduce selection bias that may occur (Houser, 2008). In this case, the literature review identified key courses with the potential for inclusion of environmental health content within undergraduate nursing programs. The inclusion criteria for

the study consisted of nursing faculty members with involvement in any of the following courses (Hays et al., 2006; Savell & Sattler, 2012);

- Community or population health
- Health promotion/Prevention of illness
- Maternal child and pediatric courses
- Health Assessment
- Medical/Surgical Nursing
- Leadership/Management/Advocacy

Further criteria were included to increase the credibility of the findings. If an individual was a nurse educator who had held an academic appointment for a minimum of one year, and who currently was teaching or had taught a course with a component that addresses any of the topics/subjects above, they were eligible to participate. Snowball sampling, a form of purposeful sampling, occurs when one participant identifies an additional individual who meets the inclusion criteria (Streubert & Carpenter, 2011). Study participants were asked to recommend individuals whom they felt would meet the inclusion criteria. Snowball sampling was viewed as beneficial in this circumstance as educators may have experience with the phenomenon of interest, but may not have been included in the initial sample selection process.

For this study, sample size was not determined prior to the study taking place but rather was determined once saturation was reached. Saturation occurs when the researcher identifies repetition in the data collected confirming the findings from previous interviews (Streubert & Carpenter, 2011). Polit and Beck (2012) define saturation in qualitative research as “the point where a sense of closure is attained because new data yield redundant information” (p. 742).

Recruitment

Gaining access to the settings required contact with the Deans or Directors of the three selected undergraduate nursing programs in Manitoba. The Dean/Director was asked for permission to access participants at each academic site (Appendix B). A Letter of Invitation (Appendix C) from the researcher, providing an overview of the study, and requesting the participation of any nurse educators meeting the inclusion criteria was then distributed. The Dean/Director was not involved in the selection or distribution process. Contact information provided in the request for participation allowed interested participants to contact the researcher directly. Due to a low response rate, snowball sampling was used and a request to the Dean/Director to attend a faculty meeting as a means of gaining participant interest was made. Interested individuals who met the inclusion criteria received an information package, including an outline of interview questions (Appendix D) and an informed consent form (Appendix E), to be completed prior to data collection. Thirteen nurse educators, representing each of the three academic sites – Large Urban (N=6); Small Urban (N=3; Northern (N=4) - participated in the study.

Data Collection

The data generation technique chosen to gain knowledge of nurse educators' perceptions of ecoliteracy in undergraduate nursing programs was a semi-structured telephone interview. Streubert and Carpenter (2011) recognize that semi-structured, open-ended interview questions have the ability to provide interview participants with the opportunity to describe in detail their experience with the phenomenon. Semi-structured interviews use questions that are open-ended, allowing participants to expand on thoughts and ideas surrounding their perception of the phenomenon. The interview guide is developed by an individual knowledgeable in the area of

interest (in this case, the researcher). The questions included within the interview guide (Appendix D) were designed specifically to focus on areas related to further understanding the concept and identifying areas for change (Neergaard, et al., 2009). In this case, participants were asked for their perspectives about ecoliteracy in undergraduate nursing programs.

Interviews that utilize technology allow for greater participation from individuals whom otherwise might not be able to participate due to their geographic location (in this case, the researcher lived in a northern community that was 300km away from the *closest* of the three study sites). Interviews conducted by telephone also have cost saving benefits as travel and time are reduced (Watson, Mckenna, Cowman, Keady, 2008). According to Novick (2008) little evidence exists regarding the use of telephone interviews in qualitative research and it currently remains to be determined whether or not the quality of information is compromised. The main concern with telephone interviews is the loss of visual cues as the participant and interviewer are not face to face (Gillham, 2005). After obtaining consent, the approximate 60-minute interviews were audio-recorded, using appropriate telephone audio-recording equipment. Data collection took place until saturation occurred, at which time data collection stopped and the data analysis process began.

Data Analysis

A transcriptionist was utilized for managing the transcription of interview data. Data transcription took into consideration pauses and ellipses and, to aid in the readability of the data, any expressions and distracting nuances (“hmms”,” ums,” etc.) were removed, assisting the reader to focus on the underlying themes of the interview (Tappen, 2011). According to Munhul (2007) it is time consuming for the researcher to be involved in the transcription process although researcher involvement is viewed as beneficial to assuring an accurate representation of

the audio recorded interviews as well as providing the opportunity to begin data analysis. The researcher completed a "spot check" of the transcribed documents in comparison to the original completed audio-recorded interviews. A "spot check" requires a sub set of the transcribed interviews to be reviewed by the primary researcher, looking for potential errors in transcription or misinterpretation of content (Streubert & Carpenter, 2011).

Providing anonymity of participants in a descriptive study with a small sample size can be difficult (Munhul, 2007; Wood & Ross-Kerr, 2011). To maintain anonymity during the transcription and analysis phases, and when reporting findings, codes were used to track participants and their location. Participants were made aware of the steps that would be taken to protect their anonymity. In order to ensure the data collected was well organized and easily retrieved, and that participant confidentiality was maintained, a cataloguing system was used. Houser (2008) recommends the following information be included within a cataloguing system "the source, date of collection, and type of data should be noted with each piece of data" (p.517). All of the data obtained was kept electronically on a password protected USB drive and the transcribed interviews were further encrypted with a password.

The data were analyzed through the process of thematic content analysis. Polit and Beck (2012) describe the process of thematic content analysis as "the process of organizing and integrating narrative, qualitative information according to emerging themes and concepts" (p.560). To begin the process of thematic content analysis an initial review of a sample of transcripts from each academic site was completed. The researcher read through each transcript once to get a sense of the content and to ensure that the transcript was clear, then a second time to begin forming codes to group similar data. In this case, initial coding was done by following the interview question guide. From these codes, themes arose and a general sense of what the

data was saying could be inferred. Codes are words used to describe a data set and include "labels, descriptions, or definitions assigned to data to allow them to be categorized and analyzed in qualitative research" (Houser, 2008, pp.518). According to Streubert & Carpenter (2011) it is recommended that neophyte researchers are mentored during data analysis by an experienced researcher. During this early phase of data analysis, the author's primary advisor reviewed several transcripts to aid in validating the codes developed from the data. Themes are recurrent data derived from statements conveying meaning, identity, or knowledge regarding a participant's perceptions or experiences (Streubert & Carpenter, 2011). Once potential themes are established and areas for further analysis were identified, the researcher further immersed herself in the data to establish an understanding of the participants' experiences. The themes identified were then translated into thematic sentences, which are a means of summary that have the ability to preserve the intricate nature of each participants' experience with the phenomenon (Sandelowski & Leeman, 2012). The goal of data analysis in qualitative description is to understand the latent variable and is achieved when the researcher stays close to the data providing a "rich description" of the participants' experience to further clarify the concept (Neergaard, et al., 2009). Themes were also analyzed to determine commonalities or differences of perceptions between nurse educators in different study sites.

Methodological Rigor

In order to increase credibility of findings peer debriefing with the primary advisor took place at regular intervals, and occasionally with other committee members. It is important to note the intended purpose of the peer debriefing is to provide theoretical validity. Sandelowski (1998) posits that peer debriefing can provide "expert criticism" assisting with question revision,

framework selection, and suggesting how data be re-presented. The role of the outsider-expert does not include the interpretation of findings.

To ensure the transcribed documents accurately portrayed the participant's experience, each participant was offered the opportunity to review the transcript from their interview. The participants were asked to respond within 7-10 days should they identify a discrepancy in the interest of time. Checking back with participants used as a form of member checking is completed to see if participants recognize the findings reported as their own (Streubert & Carpenter, 2011). All participants were provided the opportunity to review their transcripts for accuracy; no discrepancies were identified. Additionally, an audit trail will be available to show examples of how data was interpreted and synthesized. Streubert and Carpenter (2011) identify an audit trail as advantageous in demonstrating the researchers thought processes when drawing conclusions about the data collected.

Ethical Considerations

Ethics approval for the study was obtained from each of the study sites. Informed consent was obtained from the study participants prior to beginning the interview process. The consent form was reviewed with the participant and any outstanding questions were clarified prior to beginning the interview. A copy of the consent form was left with the participant for their review and reference as part of the process of informed consent. The informed consent form clearly outlined the purpose of the study and provided a definition of the concept the researcher sought to further explore. The study procedures clearly outlined the study length, and the use of interview questions to guide the interview for data collection.

The use of an audio recording device for the interview was explained as well as the use of reflective notes for the purposes of data collection. To assist in maintaining confidentiality the

transcriptionist was required to sign a Pledge of Confidentiality (Appendix F). Anonymity was further maintained by assigning participants a code to describe their location. The code consisted of a letter, representing the academic institution/region--(A) Small Urban, (B) Large Urban, and C) Northern—and then each participant was sequentially numbered under their appointed academic institution. For example, participant #1 from the 'Small Urban' setting would receive A1 as a participant code, participant #2 would receive A2 as a participant code, and so on. The principal investigator held a master copy of the participant codes. Participant codes were again used in the discussion of findings so as not to identify the study sites where participants were located. Participants' names were also listed in a separate document, along with a participant number to be used when citing quotes in the discussion section.

The audio recordings and any additional information were kept secure and confidential. The participants were made aware that direct quotes or statements made during the interview could be used in a final report, but, in such a case, no identifiable information would be linked with the statements. Individuals who participated in the study received a small honorarium (e.g., $10 Tim Horton's gift card) to compensate for their time. Participation was voluntary and each individual had the ability to refuse to participate or withdraw from the study at any time.

Chapter Summary

The study objectives, research design, data collection and analysis methods, strategy for maintaining rigour, and ethical considerations were presented. The descriptive qualitative study design was chosen due to the dearth of empiric evidence that exists in the area with the anticipation of further understanding the perceptions nursing educators have regarding ecoliteracy within undergraduate nursing programs. A sample from three unique geographic

areas in Manitoba was gathered to provide insight from various courses of three different nursing programs.

CHAPTER FOUR – Findings

This chapter describes nurse educators' perspectives on ecoliteracy, which are organized according to the following seven key themes: 1) Importance of Ecoliteracy in Undergraduate Nursing Programs: [Connection between human health and the environment; Reciprocal relationship between health care systems and the ecosystem]; 2) Support for Ecoliteracy in Undergraduate Nursing Programs [Courses with formal objectives supportive of ecoliteracy; Courses with no formal objectives supportive of ecoliteracy]; 3) Forms of Content Delivery Supportive of Ecoliteracy/Evaluation [Content delivery; Evaluation methods]; 4) Future Considerations for Ecoliteracy Content: Potential Course Fit [Theory; Clinical]; 5) Barriers to the Inclusion of Content Supportive of Ecoliteracy in Curriculum [Content saturation; Emphasis on hospital based nursing; philosophy of nursing; Students do not appreciate ecoliteracy content; Threaded or laddered content is lost]; 6) Strategies to Address Barriers [Research and scholarship; Curriculum committee; Threading and laddering content; Role of the professional association; Role of the regulatory body]; 7) Personal Values.

Theme One – Importance of Ecoliteracy in Undergraduate Nursing Programs

When participants were asked about their perceived importance of ecoliteracy in undergraduate nursing programs all but one participant reported feeling that ecoliteracy was "important" or "very important" for nursing students. The one nurse educator's perception that ecoliteracy in nursing education is of decreased importance was related to the licensure exam, as she explained:

> Unfortunately the pragmatic question I believe is what the students are focused on and what nurse educators are obligated to focus on. Whether we like it or not the focus is on writing a qualifying exam that is based on biomedical issues. Viewed in this sense it is not

> considered important, however how can one practice to their full capacity if they do not understand the environmental impacts on health? (Participant 4)

Most commonly, participants report that ecoliteracy was important in undergraduate nursing programs. Their responses can be classified in two main ways: (i) Connection between human health and the environment; (ii) Reciprocal relationship between health care systems and the surrounding environment and greater ecosystems.

Connection between human health and the environment. Several participants stated it is the responsibility of a nurse to understand their role as it relates to the environment and human health. One participant explained that this is "because nurses work with people within a community that is impacted by ecology" (Participant 1). Another individual stated:

> I think it's very important that students be aware that this is a role when it comes to connecting health and the environment…. And so it's always been part of the curriculum that I've taught, even just to get students aware of that connection between health, environment and nursing. (Participant 9)

Another participant brought forth nurses' ethical responsibility as outlined in the (CNA) (2017b) *Code of Ethics* document. This document recognizes the nurses' role in addressing environmental health concerns as well as the nurses' responsibility to understand the relationship between human health and the environment.

> The CNA *Code of Ethics* actually speaks to environmental issues and nurses need to address those issues because they affect health and well-being of humans… It just really stressed how important the environment is and how nursing needs to be involved in addressing issues that impact the environment in a good way. (Participant 10)

One educator noted the connection between ecoliteracy and nurses' scope of practice: "If they (students) don't understand the environmental impacts on health, they're not working with a full toolkit" (Participant 4).

Reciprocal relationship between health care systems and the ecosystem. In some instances, participants reported a need for greater understanding of the concepts that support ecoliteracy. For example, being able to identify the reciprocal relationship between health care systems and the ecosystem was reported by some participants as being "very important" to nursing students' education. One participant shared her perception of the importance of ecoliteracy in nursing education as something that is "fundamental to health", stating: "I would use the word fundamental taking into consideration the impact the profession has on the environment and vice versa" (Participant 2). The same participant shared their viewpoint of the importance of preparing students to be future leaders in the field of nursing and that this means understanding the impact of our practice on the environment and those we serve.

Another individual discussed the reciprocal relationship between health care systems and the ecosystem in terms of an upstream approach.

> In terms of a more upstream approach I think that nursing students need to better understand that we're talking about something more than recycling. And they also need to understand the dent in the armour that these huge hospitals put on the environment in terms of things like waste and waste disposal, generating impact in terms of how green is our health care system. (Participant 7)

Theme Two – Support for Ecoliteracy in Undergraduate Programs

When participants were asked to discuss ways in which ecoliteracy is being maintained in the academic site where they were employed, the following sub themes were identified: courses with formal objectives supportive of ecoliteracy and courses with no formal objectives supportive of ecoliteracy. It was also noted that support for ecoliteracy in the nursing program varied depending on the study site the participant was recruited from. For example, participants from the Small Urban and Northern study sites were more likely to indicate they were not aware of formal course objectives supporting ecoliteracy than participants from the Large Urban study site.

Courses with formal objectives supportive of ecoliteracy. Participants who described being involved in courses that are related to prevention of illness or health promotion and maternal child courses reported having formal course objectives that included concepts that would support ecoliteracy amongst nursing students. The course material reported as having formal course objectives with content that would support ecoliteracty were those with a focus on (in order of frequency): (i) prevention of illness; (ii) health promotion; (iii) maternal - child health.

Prevention of illness. Participants noted content would include topics such as trends and illness patterns related to climate change, food or waterborne illnesses, risk reduction, and toxic effects. One individual reported: “We did talk about, you know, the shifts in trends in health and illness patterns related to climate change and global warming” (Participant 4). Another identified a course objective related to environmental contamination and the relationship to human health that could be considered as supporting ecoliteracy in nursing students. This same participant

reported analyzing and discussing the biological behavioural, economic, political and environmental factors that create increased risks for contracting a food or waterborne disease.

***Health promotion*.** Course objectives included content connecting biological, behavioral, social and environmental risk factors in relation to health; using a systems perspective to analyze the impact on health; and viewing health holistically. One participant believed that knowledge related to the environment contributes to student's ability to practice in a holistic way, and can contribute to the improved health of families and communities if their awareness was raised. Another individual expressed never having encountered a barrier to the inclusion of content that would support ecoliteracy: "I have not experienced a lot of barriers in this regard because the course and the courses (health promotion/prevention of illness and community health) that I've taught kind of require it." (Participant 7).

Maternal-child health. This educator shared an experience with ecoliteracy content describing it as a new concept that has made its way into the curriculum in recent years.

> "Where I first recognized that – that environment awareness is sort of starting to come into the curriculum was two years ago when our Maternal Child courses we're teaching, they actually put into the curriculum that we needed to address environment and child health. So they made the formal link, and that was the first time I'd seen it" (Participant 10).

Courses with no formal objectives supportive of ecoliteracy. Participants whose teaching responsibilities fell outside of the above-mentioned courses but that met the inclusion criteria more frequently reported no formal course objectives that would support ecoliteracy in nursing students. One participant noted: "We don't have a formal course to discuss it. It is one of the concepts that, I think we informally consider ourselves – we call it threading it – threading it

through the curriculum" (Participant 2). Whereas, another participant explained that the discussion of concepts supporting ecoliteracy are not embedded in the curriculum; rather, the content would be addressed informally usually during a discussion related to current events—such as climate change.

Educators from the Northern study site reported having the perception that there was a lack of concepts that would support ecoliteracy in the program. One individual suggested that the problem went beyond their own program: "I think that, probably, it isn't directly addressed very well….in education and nursing, at… this point" (Participant 10). This same educator did say that the first time she could recall content that would support ecoliteracy was when it was made a part of the curriculum and a formal connection was made in the course, Maternal Child Health, that was offered at the academic site.

Theme Three – Forms of Content Delivery/Evaluation

Content delivery. Various forms of content delivery were described by participants that would support ecoliteracy in undergraduate nursing students (in order of frequency): (i) classroom/online discussion; (ii) lecture; (iii) group project; (iv) presentation/another project; (v) video clip; (vi) guest speaker.

Classroom/online discussion. This was the most commonly identified form of content delivery. Participants identified a variety of topics where ecoliteracy content was raised, including discussion about nursing roles and how nurses can take action to address environmental concerns. Another participant described her approach: "I would have them (students) read the article in advance, and then I would do a short presentation just on the broader issue of environmental concerns…And then we would have a class discussion" (Participant 2).

At the Large Urban site, there is an assignment that utilizes an online discussion forum for students to explore topics related to environmental health content. As one educator at this site explained: “We have a discussion forum where students explore environmental issues and ask critical-thinking questions, and have a discussion online about the different issues that they've chosen to research” (Participant 9). Some topics covered in the online discussion were provided: for example, students have researched multiple sclerosis to see if there are any environmental links; or firemen who would be exposed to smoke and the relationship to lung cancer. This same participant noted it is important to expose all of the connections between health and the environment and the relationship to overall disease burden.

Lecture. A few participants stated that the majority of the content covered is via lecture. One participant stated: “that's all it is pretty much in that course (prevention of illness) is lecture” (Participant 13). Another participant provided examples of environmental health topics that would be covered using the lecture method of content delivery: “One was the heat wave in Chicago in 1995, one was Katrina, I use Walkerton and I use Lake St. Martin” (Participant 7).

Group project. Several participants reported using a group project as a form of content delivery in the courses they were involved in. This participant describes the group size and the learning activity the students completed when providing a community with information regarding the *100 Mile Diet*:

> There would be between seven and eight students in a group; there had to be a newspaper component, there had to be a window display in the local library, and then they had to do a public oral presentation somehow about their topic. (Participant 11)

Another educator provided an example of an ecoliteracy-focused learning activity:

> They're in groups… Okay so they have to identify an environmental issue in nursing that you have observed in your classes or in your own community, explore the literature on your topic and visit the Canadian Nurses for Health and Environment website, make an informative post to clarify your thoughts about your topic and cite the literature, asking critical questions to encourage responses. (Participant 7)

Examples of topics that have been covered in that assignment include: hospital waste; air pollution and climate change; pesticides; greenhouse gases; greener approach to transfer patients; and energy conservation.

Another participant provided the following explanation of a group activity that would promote ecoliteracy in undergraduate nursing programs.

> We often use an activity where we'll divide the students into groups and they'll each study a certain disaster. So we've used Walkerton, Ontario, the SARS disaster in Toronto. And in New Orleans, Hurricane Katrina. And then there was a heat wave in Chicago, so we, you know, lots of students did each a goal for the reading of the disaster and then present as a group on, you know, how did this happen, what are the man-made implications? What was the political response? How could the disaster have been prevented? Or, you know, how could it have been better handled? (Participant 6)

Presentation/another project. One participant reported having students complete a presentation for a course of which environmental health was encouraged as a topic. Another individual talked about students involved in the community health course, where they had to

work on a project, with a topic that would support ecoliteracy taking into consideration funding as well as dissemination of information:

> There were projects where they had to… work with someone in the community to spearhead a project where they had to look at lobbying for funding - learn how to lobby for funding for a project, learn how to advertise it, and then actually do something as part of the project. An example…I had the nursing students do was - the 100-mile diet. (Participant 11)

Video clip. On occasion participants reported using video clips—often in conjunction with other forms of content delivery—as a way to deliver content that would encourage ecoliteracy in the classroom. As one educator described:

> We used a couple of different activities, but one of them was around the Lake St. Martin disaster that happened. Where you know, there was flooding, man-made consequences of the flooding. So there's the Lake St. Martin video that the students watch. (Participant 6)

Another participant described using a video to showcase community members' views related to the impact of potential environmental contamination on a community:

> So I showed them that news clip, because it was on YouTube, and then it was expressing community members concerns where they – they thought there was increased rates of cancer and they were linking it to these tailings that were coming up through the playground. They'd been covered by soil, but they were starting to be exposed. (Participant 10)

Guest speaker. In conjunction with another method of content delivery, the following educator described the use of a guest speaker when delivering content that would support ecoliteracy in an undergraduate nursing program.

> I also, in one of my classes I brought in a guest speaker, [name] who talked about the consequences and the changes to the environment and the people, and you know, they were just like, from their homes, so a lot of them are still living downtown in Winnipeg. (Participant 6)

Evaluation methods. Summative testing is used as a final evaluation of learning following content delivery and is often completed using multiple choice testing, as well as performance evaluation where students are given the opportunity to demonstrate their knowledge through the completion of an assignment such as a paper, portfolio, or a project (Dixson & Worrell, 2016). In courses where formal objectives had been developed to support ecoliteracy in undergraduate nursing courses, participants most commonly reported summative assessments as a form of evaluation.

The following participant reported a curriculum change a few years back that resulted in summative testing of content that would support ecoliteracy:

> From the courses that I am an instructor in, I see test questions that relate to, for example, food poisoning and how it affects the GI system, so – and the safety of water and waterborne illnesses. So that's where I see it and I also know, from that core curriculum change a couple of years ago, that there was questions related to pollution and the well-being of the children. And we often see test questions about – in terms of environmental

> triggers. With smoke, air pollution, and smog, etcetera, considered as triggers. (Participant 10)

Another individual recognizes that the testing of content is completed using a mid-term and final exam, where there are a few questions that are linked to content that would support ecoliteracy. The same participant notes that the questioning is low-level evaluation and that students are not expected to analyze or integrate knowledge for testing purposes but rather the focus is on identification of some issues.

For many participants rubrics were used as a method of summative evaluation following the completion of an assignment. This participant recalls having students complete an activity that is marked using a rubric that was developed using Blooms Taxonomy. “We (evaluate) the quality of their discussion or the quality of their mini paper, the quality of their responses and how they ask each other to think critically, or to reflect critically” (Participant 9). The following participant provided an example of the evaluation of learning as having students complete a research project where they would look at various roles of individuals involved in the area of environmental health and present to their peers on the topic chosen. The students were then evaluated based on their ability to research the topic.

> “For instance the role of the public health inspector…And so they would've found that information on their own and come back and made presentations of it, and we would've graded the presentations based on their ability to gather good information” (Participant 12).

Another individual (Participant 6) described having students complete a term paper that was used to evaluate student learning surrounding content that would support ecoliteracy. The participant expands the discussion related to the contents and evaluation of the assignment:

> "what are the risk factors? What are modifiable risk factors? What are non-modifiable risk factors? How do the social determinants of health play in? So for example, if somebody is experiencing poverty, are they more at risk? And they need to make an argument for why this is so. And then to bring this together, they would make a web of causation to show the interconnections between the risk factors. And that was the evaluation of the term paper itself".

Theme Four – Future Considerations for Ecoliteracy Content: Potential Course Fit

All participants, except one, reported seeing various opportunities for further expansion of concepts that would support ecoliteracy in our future nursing workforce. The one individual who reported a strong "no" when asked about the potential for content that would support ecoliteracy in future courses stated:

> There's a lot of anxiety here on the part of faculty that we have too many concepts in our curriculum already…. We constantly go back to the entry level competencies that are established by the College of Registered Nurses… you know, nursing education is increasingly being driven in, I would say, a quite an intrusive way now by regulatory bodies. (Participant 4)

The remaining participants acknowledged the potential for future placement of content that would support ecoliteracy in undergraduate nursing programs (in order of frequency) (i) theory [acute/chronic health conditions and/or older adult and pediatric courses; leadership and professional practice; issues and trends] and (ii) clinical practice [community-based; hospital-based].

Theory. The theory courses most frequently reported as being a "good fit" for content that would support ecoliteracy included:

Acute/chronic health conditions and/or older adult and pediatric courses. The following educator discussed the potential to include sustainability content in theory courses related to acute health.

> I would say…there are lots of things in acute health when it comes to waste, when it comes to managing those kinds of things. It could be part of a clinical thing, too. I'm not sure how much the environment or ecoliteracy part of – you know, hospital-based nursing? But there are issues there, too. So I think – or there might be concerns there too as far as the environment goes. (Participant 4)

Another participant identified that content to support ecoliteracy was informally included in a medical condition course due to the instructors' personal interest in the topic. The same individual believes more content to support ecoliteracy could easily be built into a medical conditions course in a more formal way. This notion that content which promotes ecoliteracy be built into theory courses that address chronic disease was mentioned by a few participants. Some participants thought that the content would be a good fit in more general courses that address chronic care, while others identified a population-specific course. For example, one individual stated: "I am thinking places where this … would fit is we have an entire course that talks about the older adult. Certain groups to me are more susceptible to the impact of the environment" (Participant 7). This same participant saw pediatric courses as a potential fit for content supportive of ecoliteracy.

> I think these kinds of concepts or ideas – because children experience the world differently than adults…And there's lots of literature around you know the impact of – again, I'm not really sure how aware people are of it, but there is a lot of literature around that talks about the impact of the environment on you know small humans and that children are more susceptible to how we treat the environment than adults. (Participant 7)

Another participant adds: "human growth and development, right, is somewhere where they could fit it in. Sometimes environment plays a huge role there as well, or can" (Participant 13).

Leadership and professional practice. The following educator admitted not knowing what the current curriculum is like in leadership and professional practice, but thought that there might be a potential fit in the course for content that would support ecoliteracy. The individual provided an example of the content that could be threaded within a professional practice course:

> I would think there would be opportunity to introduce things in professional practice, like the CNA Code of Ethics, and how it stresses the need for nurses to take action and to do education about safe environments and protecting the environment. (Participant 10)

Issues and trends. One participant suggested that ecoliteracy content might fit well in a course that includes discussion of current events.

> I think that it (content to support ecoliteracy) may come up in certain parts of the curriculum, maybe an issues course, or something like current events, you know, climate change, those kinds of [forums] that are going on, and might be introduced into a classroom. (Participant 1)

Clinical. Study participants identified a potential fit for content that would support ecoliteracy in the clinical practice areas. More frequently participants identified community-

based clinical as a potential fit however hospital-based clinical practice settings were also mentioned.

Community-based. Most frequently, educators reported community-based settings as a potential fit for content that would support ecoliteracy in undergraduate nursing programs. As one suggested:

> I could see that there would be quite some nice opportunities in…community health… students are paired with community groups or an organization that is wanting assistance from students to work on a community project… So that environmental component certainly could be a focus. (Participant 1)

A few nurse educators from the Small Urban and Northern sites reported feeling as though they had more flexibility in choosing topics for assignments within community clinical settings. One participant stated that she was involved with local government organizations in various capacities and therefore had knowledge of what the community needs were and projects that could be completed by the clinical groups. The same participant also reported that smaller class sizes likely contributed to the ability to complete projects that contained an ecoliteracy component. The participant went on to say that because the projects met the criteria outlined in the syllabus the topics covered for the clinical assignments were flexible and due to ones personal interest a topic related to sustainability was chosen. The individual also reported there was no apprehension from faculty administrators in choosing a topic with a concept that would support ecoliteracy. Another individual identified Community health clinical as a potential fit for content that would support ecoliteracy in undergraduate nursing programmes. The same individual stated that often community groups or government organizations are looking for students to assist with projects and that an environmental component could be a focus.

One educator expressed the need for more open-ended clinical practice experiences to allow for clinical placements that further integrate the concepts taught in the classroom.

> I really wish that we could create clinical practice experiences for students that are much more open-ended than they are right now... I think that the best way to understand how important this it is to actually be put in a situation where it's smack in your face. (Participant 4)

Another individual felt that the material related to environmental health can affect all aspects of an individual's health and therefore has the potential to fit into all undergraduate nursing program courses, whether theory or clinical.

Hospital-based. One participant explains that hospital based nursing has a connection to the environment and states "I'm not sure how much the environment or ecoliteracy is a part of – you know, hospital-based nursing (education)...there are issues there, too" (Participant 9).

Theme Five – Barriers to the Inclusion of Content Supportive of Ecoliteracy in Curriculum

The data collected from the participants interviewed identified five categories of barriers to the inclusion of content that would support ecoliteracy in undergraduate nursing students. The five categories of barriers most frequently reported were: (i) content saturation/time; (ii) emphasis on hospital based nursing [influence of regulatory bodies]; (iii) philosophy of nursing; (iv) students do not appreciate ecoliteracy content; (v) loss of threaded/laddered content. It was also noted that at times one category might build or influence another, which is reflected in the discussion.

Content saturation/time. Participants had a variety of things to say about the issue of content saturation and time (in order of frequency): curriculum is already jam packed; lack of

time to deliver new content; not knowing where content would fit; and how much attention should each topic receive. One educator stated: “So I think that our curriculums aren’t introducible to add new material in because it’s so jam-packed full of material already” (Participant 10). A separate educator says: “Our curriculums are…full. And that's always the answer whenever someone wants to introduce new content… I think that it's a mistake to think of the curriculum that way, but there's always resistance to introducing something new” (Participant 2). Another participant goes on to say that there is a concern around time and how much attention a topic should get and states that the topics that are given time in the curriculum are related to a patient safety requirement to ensure students enter the workforce able to meet the entry level competencies set out by the provincial regulatory body.

Emphasis on hospital-based nursing. The majority of educators expressed a perception that there is an increased emphasis placed on hospital-based nursing and content related to medical or surgical nursing practice. They identified this phenomenon as a barrier to the inclusion of content that would support ecoliteracy in undergraduate nursing students. For example, one participant suggested that community and public health content does not get the same attention or respect as acute care in terms of the role of the nurse. Another individual believes that further emphasis and value needs to be placed on nurses working in roles outside of the acute care setting:

> I also think professionally, I don’t think that nurses are - that there's a - any particular value put on the capacity of nurses to - you know, to work in policy development and advocacy roles around ecoliteracy. I think that the public perception of what nurses do is…much more limited than that. (Participant 4)

Yet another individual discussed the focus of academic nursing program content as being related to a medical model and for that reason content in "other" areas is not viewed as important. "I just think because there's such a vast amount of content to be learned within the program itself perhaps the importance isn't … it isn't weighed as highly as some of the other things in the medical model" (Participant 8). Another participant states: "But right now, you know, quite frankly the focus for the last 15 years that I've been working… has been, we need more acute care nurses. We need more acute care nurses. We need more acute care nurses" (Participant 4).

Influence of the provincial regulatory body. One participant expands the discussion in relation to how the provincial regulatory body may inhibit the inclusion of certain type of content in nursing curricula. The individual reports having too many concepts included in the nursing curriculum and goes on to express the belief that the provincial regulatory body has influence on curriculum through the entry level competency statement. Another educator refers to the entry level competency statements saying:

> You know…there's a lot of anxiety here on the part of faculty that we have too many concepts in our curriculum already. And, you know…We constantly go back to the entry level competencies that are established by the College of Registered Nurses. (Participant 4)

The following rationale was provided by a participant for the lack of emphasis placed on public and community health content: "the reason that's given is there's so much pressure from outside (regulatory body) to increase the medical content, the medical surgical content, a lot of other things are getting squeezed out" (Participant 2).

Philosophy of nursing. Another participant believes that the issue extends beyond the pressure placed upon academic sites and schools of nursing by regulatory bodies and that the

barrier is related to a philosophical perspective. The reason why there is less emphasis placed on prevention of illness is because philosophically nurse educators place a higher value in the medical model or the treatment of illness rather than prevention of illness.

> I'd say almost more of a philosophical perspective on what we should be teaching students. So some of us think we need to teach students to place a great emphasis on preventing health problems… but still I would say you know 90% of my colleagues are…interested in students coming out so they can treat these people. (Participant 7)

The following participant identifies that schools of nursing have a responsibility to provide students with the education required to pass licensure exams such as the National Council Licensure Exam [NCLEX]:

> In terms of, our curriculums are so jam-packed, the goal for graduating students is, in part, for them to be passing licensing exams and to be competent as basic graduates. And so there's a lot of emphasis on needs to address acute care and that, and there's been controversy just recently with the NCLEX. (Participant 10)

Students do not appreciate ecoliteracy content. The emphasis that is placed on the importance of the knowledge required to work in an acute care setting or hospital-based nursing varies. This extends beyond the beliefs of faculty in terms of what is considered a part of nursing practice, as noted by this participant:

> I would also say distinct lack of interest on the part of many students who do not see themselves unfortunately as - as advocates or change agents. And who just want to work on a med-surg unit and do what, you know, do whatever med-surg nurses do. (Participant 4)

Another individual recalled a particular interaction with a former student in terms of content related to a community health course, who asked what that content had to do with nursing. The educator went on to say: “students often have a hard time even when we integrate the importance of community nursing programs where they come in thinking really that acute care hospital is the focus” (Participant 1). Another participant voiced a similar opinion in terms of some student behavior:

> I think a lot of the students who take a prevention and community health course, they do it because they have to. Some of them - value it highly…that’s one minority. There's another minority that says I have no idea what this has to do with real nursing and I really wish I didn’t have to take this course. And then there's the vast majority who just say nothing. (Participant 4)

Threaded/laddered content is lost. On occasion, the nurse educators who participated in this study stated that content that would support ecoliteracy at their academic site is threaded or laddered throughout the nursing program and viewed this as a barrier. As one individual notes: “that's where the challenge comes in, in terms of every course leader or course professor has discretion about, you know, what goes into their course. And I think a lot of the threaded and laddered content gets lost” (Participant 2). Another believed an instructor’s passion for content can determine whether or not threaded content is included or discarded suggesting “an individual instructor may have a passion to discuss such things, but it doesn’t mean that other instructors will ever do it” (Participant 10). Another educator suggested there is potential for content to be lost when threaded through a program and states the importance of follow up to ensure content is not lost.

Theme Six– Strategies to Address Barriers

The study participants shared many ideas regarding how nurse educators could facilitate ecoliteracy in undergraduate nursing students. A variety of categories were reported as facilitators of change (in order of frequency): (i) research and scholarship; (ii) curriculum committee; (iii) threading/laddering of content; (iv) role of a professional association; and (v) role of a regulatory body.

Research & scholarship. Most frequently participants reported research and scholarship as the primary method to increase the uptake of content that would support ecoliteracy in undergraduate nursing programs. Approaches of research and scholarship vary amongst participants from formal research projects to informal discussions. One participant recognized that raising awareness and providing the knowledge required to take action is an important facilitator in addressing barriers to the inclusion of content that would support ecoliteracy in undergraduate nursing programs. The same participant states: "perhaps, there is opportunity in – in staff meetings and faculty meetings to sort of find out from colleagues and have a discussion about, "Well, what are you doing?" or "What should I be doing?" kind of thing" (Participant 10). Another participant reports that content which would support ecoliteracy in undergraduate nursing programs may be underway, but nurse educators may not be familiar with the term ecoliteracy, and suggests that in order to bring awareness to the term "ecoliteracy" nurse educators must begin to use this term. A separate individual identifies a view that people know the environment is important and that they are concerned about it, however, further education is required to impart the immediacy of addressing environmental health concerns. It is suggested that the way to increase awareness and one's ecoliteracy is through education: education of faculty members, followed by students who will in turn educate the populations they serve. The

same individual states “I think people are concerned about the environment, they don't know why they have to be really, really concerned right now. So I think that needs education and the education will be the buy in” (Participant 2).

Another individual who supports the importance of including nurse educators in research and scholarship as a way to increase the inclusion of content that would support ecoliteracy within undergraduate nursing programs states:

> Even the fact that you are including nurse educators in a discussion about it, is a really good way to bring the need, or consideration of it being more of a topic is critical. So encouraging people to do research on ecoliteracy and publishing, sort of educating the educators about what changes need to be made. (Participant 10)

A separate participant suggested that to raise awareness about the importance of ecoliteracy in undergraduate nursing programs a person could look into guest speaking with the provincial regulatory body and/or publishing material in *The Canadian Nurse* (journal) as a method to increase interest. Another participant suggests that we look beyond the nursing profession for individuals with an interest or expertise in the topic area and utilizing such individuals for guest speaking spots. This same participant recognizes the overlap between professions in addressing the ecological determinants of health and states that perhaps interdisciplinary education would provide an opportunity to increase nursing students ecoliteracy.

> We talk a lot about interdisciplinary education and other faculty involvement, so I would assume… for example, geography has many courses that relate to sustainability and would

> integrate, probably ecoliteracy into many of their courses. So partnering with professors from that department to have them come in as guest speakers. (Participant 1)

Curriculum committee. It was also indicated that the committee responsible for overseeing curriculum change would be an appropriate venue to facilitate the inclusion of content that would support ecoliteracy in undergraduate nursing programs. As one participant said: "I believe that presenting the topic [and this issue] to the curriculum committee would be an excellent way to look at the possibility (for change)" (Participant 1). Another participant discussed the need to raise awareness of the topic amongst faculty members and suggested this could be done though the curriculum committee in the form of threaded content. This same participant believed that threading content throughout the program curriculum rather than teaching the content as a stand-alone course would be an effective and efficient way to include content that would support ecoliteracy. Another educator built upon the thread analogy and the importance of intention when threading content in a curriculum:

> So instead of just assuming that, oh, it'll show up somewhere when the time is right …I think I would be more conscious about including the terminology and connecting the…maybe pulling all the threads together to make a rug...But I think, unless you do it consciously, at the end of the day, you're just left with a bunch of threads. And wouldn't it be nice, at the end of the day, to have a rug. (Participant 3)

Threading & laddering content. Participants identified threading and laddering content as a way to address the barriers to the inclusion of content that would support ecoliteracy in undergraduate nursing programs. As one participant noted: "if an issue is identified as laddered or threaded, as something that should be laddered or threaded then it should be at least part of the objectives in the course syllabi" (Participant 2). The assumption here is that having concepts that

have been identified as threaded or laddered within a curriculum listed as formal objectives and built into the course syllabi would help ensure content is not lost. The following participant believes faculty members as a whole have a responsibility to know what is incorporated and where the best fit for content would be.

> I think that it would be a joint effort on the part of the entire faculty to sort of ensure that it (concepts to support ecoliteracy) is incorporated and to find out where it's incorporated so there isn't really duplication, or if there is duplication that it's done in such a way that it's used to reinforce important points…I think it's just a matter of getting together and working together as a faculty to see where it fits in and if it's not in a particular area, how could we put it in there? (Participant 13)

One of the concerns brought forward by educators is that threaded or laddered content may be informal or completed on behalf of an individual instructor related to their personal interests rather then an outline to meet curriculum goals. Participants stated that threaded content should be built into the curriculum and as a result have formal objectives attached.

Role of a professional association. Study participants frequently reported the role of a professional association as a strategy to address the barriers to inclusion of ecoliteracy content identified above. In Manitoba, the recent formation of the Association of Registered Nurses of Manitoba [ARNM] was viewed as a potential resource to increase the role of advocacy for nurses in the province. Prior to its formation nurses in the province lacked support for an advocacy role in terms of nursing practice.

One participant viewed the ARNM as a starting point to raise awareness for the inclusion of content to support ecoliteracy in undergraduate nursing programs and goes on to say:

> I really believe if the professional association put forward a powerful argument in favour of this kind of beginning education in a - in an entry level practice program, that, you know, the CRNM might be interested in hearing about that. (Participant 4)

It was suggested that, in addition to the ARNM, the provincial regulatory body CRNM needs to be involved in advancing nursing education to support ecoliteracy in our future nursing workforce. The same participant as above indicated that the role of the ARNM and CRNM is to provide leadership and to raise awareness of concerns related to the education of nursing students in the province. “I think if our professional associations and our regulatory bodies bought into this idea, they could provide the leadership. And I think that nursing educators and nurses and, you know, others might sit up and take notice” (Participant 4).

Role of the regulatory body. One of the roles of the CRNM is to develop entry-to-practice guidelines that are used by nurse educators and academic sites to guide educational programs. The following individual identified one strategy to address the dearth of content supporting ecoliteracy in nursing education:

> One of the ways of putting this issue on the table as an integral part of a nursing education program is to embark on strategies that convince the regulatory bodies that this should be part of the entry level competencies for - for a new grad. (Participant 4)

Another participant identifies the need for entry level competencies to be developed by the CRNM to outline what type of knowledge is required of an undergraduate nurse in terms of ecoliteracy.

> So I think sort of strong statements from those parties that are kind of dictating, because the college does dictate what does an entry level competent nurse coming out of the

> program, what kind of knowledge do they need to have? And so I think those kinds of things help in terms of supporting ecoliteracy. (Participant 7)

The same participant indicates that more up-to-date information is required from the provincial regulatory body to address the barrier of poor student engagement.

> I think in terms of our own mechanisms within the [name of department], one thing that I would see that would be helpful in terms of addressing that is I would say more current information … from…a regulatory body…. That would be helpful in terms of us being able to say – and embedded in the entry level competencies, that students have some understanding of this (content that would support ecoliteracy). (Participant 7)

Theme Seven –Values

Study participants were asked to share their personal values related to concepts supportive of ecoliteracy. The responses generated two common themes (in order of frequency): (i) personal values; (ii) raised awareness.

Personal Values. One educator identified she highly valued ecoliteracy and links the concept to Indigenous values and beliefs stating **"**it would be really wonderful if we could include some of those traditional knowledges in all of our academic programs" (Participant 5). Another individual relates their personal values related to environmental health to being raised on a farm, seeing that how people live can contribute to illness and disability, and equating types of environmental damage to both manmade and natural disasters. A separate educator expressed a similar opinion, that coming from a farming background you were always aware of the environment.

A separate participant explains her personal values related to the environment have increased within the last five or so years “as our environment changes, and our world changes, and as we age, and have children and need to think about our children’s children, it… has actually become a point of interest to me” (Participant 8). Another educator holds similar values as the participant above stating:

> I think it's important, especially as a parent, you know, and seeing changes that are going on within our environment and not knowing, you know, what the future holds as far as, you know, what it will be like in the future for my children, their children. When you look at things like, for example, pollutants, you know, what's happening to our air, you know, right now and what's looking - you know, you're looking at global warming and so like to me it's really important that we do address issues related to and, you know, ecoliteracy and the environment itself. I think that we don't do enough really, in the way of education in general, regardless of what level of education, to sort of address issues that are occurring within, like I said, within the environment. (Participant 13)

A different individual believes that it is important to sustain the environment for future generations and says continued education in relation to the environment and global warming is required. This same individual admits to not being involved in personally in any environmental movements. Yet another participant recognizes that as an educator in her field she tends to view the world in a broader sense stating “as a human being our environment - our relationship with the environment is just a fundamental aspect of - of who we are” (Participant 2). The same individual demonstrates understanding of the link between the environment and vulnerable populations and social inequities as they relate to the environment and environmental degradation: it’s “the weakest part of the environment that show damage first and then it's always

the poorest people in our society who pay the price first." It is clear this same participant highly values the concept of ecoliteracy in the nursing profession stating "I think that there isn't an aspect of, you know, our jobs as professionals and … there isn't an aspect of our role in society that - that isn't relevant to eco-literacy and the environment".

A separate participant reported having faith as a reason for valuing the environment in their personal life. The individual stated "I belong to a - a faith organization that's very interested in issues of ecology and social justice. And I have been on their - you know, on the committee that brings these issues to the attention of the congregation for years and years and years" (Participant 4). Another individual reported work experience as a reason for increased value placed on the environment outside of the workplace. This person worked in remote areas and related the work of forest fires to wellbeing as having raised awareness in regards to the importance of environmental health literacy.

Raised Awareness. The following educator has expressed feelings of guilt having recognized that in the past she has not given the content area any consideration. The same educator goes onto say that she would likely include the content area as a topic for continuing competency with the provincial regulatory body. Another educator (Participant 3) went on to say "Well, I can say that I'm a lot more passionate about it now that I know about it."

Chapter Summary

As a result of data analysis eight key themes emerged to inform the findings of this study. It became apparent that the majority of educators who participated felt that ecoliteracy within undergraduate nursing students was very important. Ecoliteracy was viewed as important to nursing students because of the connection between human health and the environment as well as

the reciprocal relationship between health care systems and the ecosystem. When asked if undergraduate nursing programs supported ecoliteracy, responses reveal that ecoliteracy could be further supported. In some courses, formal learning objectives that support ecoliteracy already exist to varying degrees. Participants reported courses such as prevention of illness, health promotion and maternal child health courses currently have learning objectives that would support ecoliteracy. However, participants also reported that content which supports ecoliteracy in our undergraduate nursing students exists informally. Many participants felt ecoliteracy could be further supported in courses that did not have formal learning objectives to support ecoliteracy. Participants reported that courses without formal learning objectives were less likely to support ecoliteracy and content was reported as being included haphazardly and was often left to the instructors' discretion.

Various forms of content delivery and content evaluation were discussed. Findings related to content delivery were rather straightforward. It was noted that content delivery was left to theory courses and not branched over to the clinical practice setting. In terms of evaluation of content that would support ecoliteracy it was reported that knowledge acquisition was tested at a basic level on most occasions in the form of test questions.

Data analysis identified a key theme that included additional courses where content has the potential to further support ecoliteracy in undergraduate nursing students. Many participants reported multiple courses within an undergraduate nursing program where content that would support ecoliteracy could be further integrated. Included were theory courses as well as both hospital based and community based clinical practice sites. The strategies to promote the integration of material that would further support ecoliteracy include; i) incorporating formal

objectives into the course syllabi; ii) threaded and laddered environmental health content throughout a curriculum.

Several barriers were noted as common themes amongst participants however with all of those barriers strategies to facilitate the removal of such a barrier were also identified. Nurse educators who participated in the study most frequently reported content saturation as the primary barrier to the inclusion of content that would further support ecoliteracy in undergraduate nursing programs. The second most common reported barrier was related to a decreased emphasis on environmental health content. Many participants stated that the provincial regulatory body helps to set the entry level competencies for nurses in Manitoba and that there is a lack of emphasis on environmental health. Additionally, participants discussed the licensing exam for nurses does not place great emphasis on public health, community health, global health nursing let alone specific content related to environmental health.

Those who participated in the study reported research and scholarship as the most important method to facilitate an increase in the ecoliteracy of our nursing faculty and future nursing workforce, followed by presenting the issue to academic sites via their curriculum committees. Additional methods to facilitate the infusion of content which would support ecoliteracy in undergraduate nursing schools in Manitoba were to engage in dialogue with provincial associations to advocate for greater infusion of content that would support ecoliteracy, and addressing the role of the regulatory body and its ability to influence the content within nursing education.

Although the main focus of this study was not to determine the values of participants related to ecoliteracy a few themes became apparent during data analysis. In terms of values, many individuals who participated in the study reported having valued the environment in their

personal lives to varying degrees. However, the most intriguing theme that emerged was related to raised awareness. A few participants reported having an increased interest in the subject matter following participation in the study.

CHAPTER FIVE – Discussion

The evidence available demonstrating a relationship between human health and the environment is continuously expanding. Nurses are well positioned to address environmental and ecological health concerns related to human health. They have contact with patients and health care providers in various settings-- homes, communities, schools, clinics and tertiary care centres, to name a few—where they have an opportunity to observe environmental conditions. Nurses possess a broad knowledge base that provides a "good foundation to understand and apply environmental health concepts" (Hewitt et al., 2006, pp. 461). In fact, nursing is a profession founded on a conceptual framework proposed by Florence Nightingale that recognized the influence environment can have on one's health (Pfettsher, 2006). However, it is important to further build nursing knowledge in regards to the environment as it relates to the populations that nurses serve in the 21st century.

Previous research has shown that registered nurses are lacking in their ability to address the environment as a determinant of health, acting as a barrier to nurses' ability to incorporate basic environmental health concepts into practice. (CNA, 2009; VanDongen, 2002). With growing concerns relating to environmental health and the stability of ecosystems it can be assumed that greater emphasis would be required in undergraduate nursing programs to aid in preparing future nurses to address health related concerns. For this reason, the intent of this study was to identify nurse educators' perceptions about ecoliteracy and its application within nursing education.

The study findings suggest that nurse educators in undergraduate nursing programs within the province of Manitoba believe ecoliteracy is of high importance for nursing students as it relates to the profession of nursing. When participants were asked what degree they felt ecoliteracy was important to nursing students, all but one participant stated ecoliteracy was either

"important" or "very important" for nursing students. This finding supports the CNA *Nurses and Environmental Health (2017c)* position statement which states "There is a role for every nurse to promote and support actions to optimize the health of the environment because of the link to human health" (pp. 1). The findings are indirectly related to Savell and Sattlers' (2012) research that revealed 91.7% of nursing students surveyed believed that environmental health was part of nursing and that 95.8% of students believed it was important.

Participants were asked to identify courses where they believed content that would support ecoliteracy in nursing students would have a potential fit. The following courses emerged: acute/chronic health conditions and/or older adult and pediatric courses; leadership and professional practice; issues and trends as well as clinical courses both community based and hospital based. The theme surrounding potential course fit is consistent with the findings reported by Savell and Sattler (2012) who recognized the following courses as an appropriate fit for the inclusion of environmental health content: pediatrics; assessment; policy; and leadership. Additional courses include: maternity; geriatrics; adult courses as well as an issues course (Hays et al., 2006). In addition to theory courses, Hays et al., (2006); Sweeney and de Peyster (2005) support the inclusion of environmental health content in the clinical practice setting consistent with the results of this study. The study results are consistent with previous research findings as participants reported a potential fit for content that would support ecoliteracy in clinical practice areas both community and hospital-based settings.

Various forms of content delivery were reported by participants as useful when delivering content that would support ecoliteracy. These methods of content delivery include: classroom and online discussion; lecture; group project; research paper; presentation/another project; video clip; and guest speakers. Participants reported the use of current events in classroom discussions,

review of current research as well as content related to risk appraisal. This study confirms what is found in the literature; for example, Gerber and McGuire (2010) list the following forms of content delivery as appropriate for the inclusion of environmental health content within nursing curricula: review of current research; review of local issues; group discussions; risk appraisal; and case studies.

Confirming what is already known (CNA, 2017a), study findings indicate research and scholarship as a method to increase the dialogue related to the topic of ecoliteracy within nursing academia. Suggestions made by participants to increase research and scholarship include: clarification of terminology (ecoliteracy); engaging/educating faculty members; using presentations; and publications. It has become evident throughout the process of completing this project that there is a great degree of ambiguity that exists related to terminology. As a profession, nurses will need to secure language related to environmental health, ecological health, ecosystem health and ecoliteracy or environmental health literacy, a definition that suits the needs of the profession and the populations they serve. Multiple frameworks exist, all with slightly different meanings and applications; however, further classification of terminology is required for pedagogy guiding frameworks to allow for standards and assessments in education (McBride et al., 2013).

An additional strategy for the facilitation of content that would support ecoliteracy includes staff engagement. This finding is consistent with Hewitt et al., (2006), who identified the need for faculty incentives and opportunities to encourage greater faculty involvement. Additionally, Sweeney and dePeyster (2005) recommend engaging faculty members to gather baseline knowledge of concepts that would support ecoliteracy as a means of increasing environmental

health content within nursing curriculum. It is recognized that in order to assist in the infusion of content that would support ecoliteracy greater faculty involvement is needed.

Adding to the current discourse in the literature, participants' responses revealed two key themes regarding the importance of ecoliteracy for nursing students. Participants felt ecoliteracy was important for nursing students because there is a connection between human health and the environment, as well, there is a reciprocal relationship between healthcare systems and the surrounding ecosystem. The CNA (2017c) recognizes the link between the health system and the surrounding environment. It posits that as nurses become ecoliterate they will begin to recognize the impact that the health system has on the environment and, as a result, encourage environmental health and sustainability both professionally and personally.

A significant addition to the current dialogue pertains to barriers to the inclusion of environmental health content in undergraduate nursing programs and nursing students corresponding level of ecoliteracy. Study findings indicate various barriers exist to the inclusion of content that would support ecoliteracy in undergraduate nursing programs. Five key themes emerged, content saturation being the most prominent finding, which indicates that nursing programs are already experiencing overloaded curriculums, however, educators do see areas for the inclusion of content that would support ecoliteracy within undergraduate nursing programs.

Study participants suggested scholars and or experts in the subject should increase faculty awareness through presentations and faculty discussions. Adding to the current discussion in the literature, participants also suggested presentations to the regulatory body and the local nursing association as a way to increase awareness and entry to practice requirements to reflect the growing health concerns related to the environment. Lastly, participants noted the importance of

publication to increase the amount of content included in undergraduate nursing programs that would support ecoliteracy of our future nursing workforce.

Study Limitations

The results of qualitative research are not generalizable to contexts beyond the study sample. Instead the concept of transferability is used, which implies that the results of the research can be applicable to similar situations or individuals, however this is left to the reader to decide (Sandelowski & Leeman, 2012). Additionally, it must be said that with qualitative description, variations could arise when interpreting findings as one researcher's interpretation of findings could vary from another's. As Sandelowski (2000) notes, researcher bias may occur as "no description is free from interpretation" (p. 335).

Although this research study achieved its objectives, there were several limitations. The primary limitation occurred during the recruitment phase of this study. Purposeful sample selection was used to recruit participants; however, gaining participants who met the original inclusion criteria was extremely difficult. At two of the study sites the researcher was required to attend a faculty meeting to seek out participants and provide an opportunity for educators to ask questions or raise concerns regarding participation in the study. It was during these discussions the writer became aware that some faculty members were interested in participating however those same individuals did not meet the inclusion criteria. As a result, the inclusion criteria were revised to expand eligibility for participation in the study. The changes included removing the time frame for required teaching experience within specific courses, and expanding the courses eligible for inclusion in the study. Due to the difficulty recruiting study participants the time for completion of this research project was significantly increased.

A second limitation is that the number of participants in this study was lower than anticipated (one academic site only had three participants). Although it is believed data saturation was reached, it is possible that not all perspectives were captured. In addition, the study was only conducted with nurse educators in one Canadian province, so the findings may not be applicable to nurse educators in other provinces and territories. A third limitation occurred during data collection as some participants reported confusion regarding the term ecoliteracy--either not having heard the term ecoliteracy before, or not knowing what ecoliteracy had to do with the nursing profession. Although the letter of invitation included a description of the concept of ecoliteracy, it is possible that nurse educators were hesitant to participate in the study due to the perception that they didn't know enough about the topic, resulting in the lower than anticipated participant response rate.

Strengths of the Study

Although it was not the main objective of this study to evaluate participant values, two themes emerged during data analysis that were not anticipated. Study participants often reported having a personal interest or connection to the environment and others reported having an increased awareness and interest in the subject as it relates to nursing education and practice as a result of participating in the research study. Throughout the research process it became evident that the participants enjoyed contributing to the study and also reported having expanded awareness and interest in the subject area as a result. As the following participants stated: "Well I can say that I am a lot more passionate about it now that I know about it" (Participant 3); and "It's definitely something that we need to build into our curriculum more. And it is…the more that I've thought about it since agreeing to participate in this conversation, the more I am thinking it's important for them (nursing students)" (Participant 8). This expanded awareness

and interest among nurse educators may provide the momentum needed to further add to the amount of environmental health content included in undergraduate nursing programs resulting in an increased level of ecoliteracy amongst our future nursing workforce. Additionally, the interest expressed among participants provides hope for faculty engagement and potential champions within an organization to increase research and scholarship and begin a formal thread within a nursing programs in Manitoba.

Recommendations for Future Practice

During data analysis, it became strikingly clear that, although the current undergraduate nursing curriculum in Manitoba does include some environmental health content, there is a need to increase not only nursing students' ecoliteracy, but also nursing faculty interest in the subject area to encourage the integration of content into nursing curricula (Hewitt et al., 2006). Future recommendations for practice include: (i) threading of ecoliteracy content in the undergraduate curriculum; and (ii) continuing education.

Threading of Ecoliteracy Content in Curriculum. A common recommendation of participants is to thread and ladder content that supports ecoliteracy in undergraduate nursing programs. An example could be related to the topic of sustainability, which is included within Manitoba's entry-to-practice document (CRNM, 2012). The CRNM entry-to-practice document includes the following statement under professional accountability and responsibility: a nurse "recognizes and takes initiative to support environmentally-responsible practice (e.g., observing safe waste disposal methods, using energy as efficiently as possible and recycling plastic containers and other recyclable materials)" (p. 6). The entry-to-practice document serves as a guide within nursing education to assist with curriculum development.

In order to *purposefully* include environmental health content within undergraduate nursing programs that would support ecoliteracy, the findings suggest that academic sites include formal ecoliteracy learning objectives within relevant courses. In the case of sustainability, curriculum committees could determine the course(s) where sustainability content would be well suited and develop a learning objective(s) to meet the entry-to-practice statement related to sustainability. It is important to note that further research is required to differentiate the knowledge that is required of an entry-to-practice registered nurse and knowledge which is considered advanced practice knowledge (Hewitt et al., 2006). Since Standards of Practice are used to guide practice it might be beneficial to develop standards of practice that are required for environmental health nursing. Currently, there are no standards of practice that exist for environmental health nursing (Gerber & McGuire, 2013). Perhaps further research would include an environmental scan and literature search to organize the subject matter required of entry-to-practice nurses in Canada and that which is considered advanced knowledge.

Continuing Education. This study focused on how educators understand and perceive ecoliteracy within undergraduate nursing programs. One study participant suggested that, with the current concerns of faculty regarding content saturation in undergraduate nursing programs, perhaps content related to the environment would be appropriate as a special interest area. With the growing concern related to environmental health and ecological health, it can be inferred that nurses, and the health care profession as a whole, will require further education beyond the basic understanding that can be offered at the undergraduate level. Continuing Education for registered nurses offered thru a special interest group such as the CNA associate group Canadian Nurses for Health and the Environment is one way to address the current knowledge gap that exist within the profession.

Stand-alone course offering – A continuing education course or post-graduate course can be developed and offered as an elective or to RN's as part of their continuing competency. This is consistent with the recommendation made by Avery (1996) and Hill et al. (2010) as a way of increasing the environmental health knowledge of nurses. The course(s) could be delivered as an online learning module or as continuing education modules in order to meet the needs of the nursing workforce. Miller, Valenti, Schettler and Tencza (2016) have developed an online learning module to increase health care professionals' environmental health literacy. It is called *A Story of Health*; the resource is available online which makes it easily accessible and can be completed at the leisure of the individual.

Gaining Momentum

Amid growing concerns related to pollution, climate change and disaster management, one might infer that we are currently living during a threshold for change. Landrigan et al. (2017) identify a growing health concern related to pollution and the detrimental effects on human health and the health of our planet's life support systems and the surrounding ecosystems. There is a responsibility amongst health care professionals to reduce carbon emissions both personally and professionally. Nurses are required to further build the knowledge related to environmental health and the effects of pollution on human health (Landrigan et al. 2017).

In addition to growing concerns related to pollution, "climate change is believed to be one of the largest threats to human health that the planet has ever experience" (Sullivan-Marx & McCauley, 2017, p. 593). Climate change is a social justice issue. It has the ability to affect all individuals, but the most vulnerable in society will likely experience the greatest health effects (Leffers, Levy, Nicholas, & Sweeney, 2017). Nurse educators can play an important role in preparing future nurses to address health concerns as they relate to climate change (Sullivan-

Marx & McCauley, 2017; Leffers et al., 2017). Within the profession of nursing there is a need to further develop the curriculum as it relates to climate change and human health in undergraduate nursing programs and as a continuing education (Leffers, et al, 2017).In terms of disaster management, nurses and the health care setting will require resilience in order to persevere during complex situations. Nurses will need to take into consideration the deleterious effects of climate change, anticipating, and preparing for the harmful effects on human health and the health care system. Resiliency is required not only on an individual basis, but also a requirement from a larger perspective in terms of the health sector (Kurth, 2017). The health sector will require preparation in order to properly respond to an impending crisis, in order to maintain essential functioning, and mitigate the consequences associated with the crisis (Kruk, Myers, Varpilah, & Dahn, 2015).

CHAPTER SIX - Conclusion

The purpose of this descriptive qualitative research study was to explore and describe nurse educators' perceptions of ecoliteracy in undergraduate nursing programs within the province of Manitoba. The findings both supported, and added to, what was known about the topic. Participants were able to provide detailed description about their views related to ecoliteracy within undergraduate nursing programs in Manitoba. This study demonstrates that, while nurse educators feel that ecoliteracy is important for nurses at the undergraduate level, there are many complexities involved in achieving ecoliteracy within undergraduate nursing programs in Manitoba. Further research should be conducted to explore how to best achieve ecoliteracy within undergraduate nursing programs, including how to differentiate the knowledge required of an entry-to-practice nurse and that required of a nurse in a speciality practice area.

The demand for nurses to be literate in terms of environmental and ecological health concerns will continue to increase as the stability of ecosystems continue to decline affecting human health and the health care system and vice versa. Nurses who are able to identify their individual impact on the environment, and the impact the greater health care system has on the surrounding ecosystem, have the ability to adapt and mitigate climate related human health concerns to develop resilient health care systems and healthy populations.

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Appendix A

Definition of Terms

Type of Literacy	General Conceptions of Environment	Dominant Educational Objectives	Primary Pedagogical Approaches	Examples of Strategies	Questions for Further Discussion
Environmental Literacy	□ Problem □ Field of values	□ Develop problem-solving skills, from diagnosis to action. □ Develop a system of ethics. □ Adopt environmentally responsible behaviors.	□ Cognitive □ Pragmatic □ Affective/ Moral	□ Case study, issue analysis, problem-solving project. □ Analysis and clarification of values, criticism of social values.	Must environmental literacy be fundamentally oriented toward problem solving? Are environmentally literate individuals necessarily engaged in action projects aimed at resolving environmental issues, or are they simply prepared to do so? Alternatively, considering the state of our world, is environmental literacy essentially useless if it is not manifested in active problem solving? What is the range of environmental values appropriate for

					environmental literacy, and who should determine them? What are the particular values or sources of values that underlie environment-ally sound decisions and behavior?
Ecological Literacy	□ Object of study □ System	□ Acquire knowledge of ecological concepts and principles. □ Develop skills related to the scientific method: observation and experiment-ation. □ Develop systems thinking: analysis and synthesis. □ Understand environmental realities in view of informed decision-making.	□ Cognitive □ Experiential	□ Observation, demonstration, experimentation, research activity. □ Case study, environmental system analysis, construction of ecosystem models.	Is the scientific method a necessary and sufficient way to understand environmental realities, or is it imposing a quest for *the* right answer, as is customary in the sciences? Must an individual necessarily have a systemic, comprehensive vision of his or her reality in order to be ecologically literate? And, in practical terms, is ecological literacy different than environmental literacy?

Ecoliteracy	□ Shared resource for sustainable living □ Gaia	□ Promote and contribute to economic development that addresses social equity and ecological sustainability □ Develop the many dimensions of one's being in interaction with all aspects of the environment. □ Develop an organic understanding of the world and participatory action in and with the environment.	□ Cognitive □ Pragmatic □ Holistic □ Intuitive/ Creative	□ Case study, social marketing, sustainable consumption activities, sustainable living management project. □ Immersion, visualization, creative workshops.	Precisely what is the ecoliterate individual striving to sustain under the aegis of sustainable development, at what level, and over what spatial and temporal scales? How is the ecoliterate person to judge which actions will positively contribute to sustainable development (see also Bonnett, 2002)? What roles might intuition, creativity, and spirituality play in enhancing ecoliteracy? Alternately, what are the pitfalls that may be associated with a spiritual approach?

Appendix B

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TO THE OFFICE OF THE DEAN

I am a graduate student in the Masters of Nursing program at the University of Manitoba in the process of completing my thesis project. The title of my thesis is 'Nurse Educators' Perceptions of Ecoliteracy in Undergraduate Nursing Programs.' Ecological literacy equips students with the knowledge and competencies necessary to address complex and urgent environmental issues in an integrated way, and enables them to help shape a sustainable society that does not undermine the ecosystems upon which it depends. The intent of this interaction is to request your permission to contact members of your faculty (academic staff) requesting participation in a study. Once your permission is granted, using the online faculty directory, a letter of invitation will be sent to all nursing faculty.

For further information regarding this request for information please contact;

Jennifer L. Otto

umotto@myumanitoba.ca

Appendix C

UNIVERSITY
OF MANITOBA

College of Nursing
Faculty of Health Sciences
Winnipeg, Manitoba
Canada R3T 2N2
Telephone: (204) 474-7452
Fax: (204) 474-7682

A Letter of Invitation

Greetings,

My name is Jennifer Otto and I am a graduate student in the Master of Nursing program at the University of Manitoba. This letter is being sent to you to identify individuals meeting the inclusion criteria outlined for the study.

For my Master's thesis, I am conducting a study about **Nurse Educators' Perceptions of Ecoliteracy in Undergraduate Nursing Programs.** Dr. Benita Cohen of the College of Nursing, *Faculty of Health Sciences, at the University of Manitoba* is my advisor for this study. Ecoliteracy refers to a way of thinking about the world in terms of its interdependent and natural humans systems, including a consideration of the consequences of human actions and interaction within the natural context. Ecological literacy equips students with the knowledge and competencies necessary to address complex and urgent environmental issues in an integrated way, and enables them to help shape a sustainable society that does not undermine the ecosystems upon which it depends (Capra, 2009). With growing concerns related to global warming, climate change and additional environmental health issues, all health care providers will require some degree of ecoliteracy to support the health of Canadians into the future. However, there is little evidence regarding the level of ecoliteracy among nurses in Canada, or the extent to which Canadian nursing programs promote ecoliteracy.

I would like to conduct a telephone, audio-recorded interview with you about your perceptions of ecoliteracy in undergraduate nursing programs. The interview will take approximately one hour of your time.

If you are a nurse educator who has held an academic appointment for a minimum of one year, and who currently teaches or has taught a course that has a component that addresses any of the topics/subjects below, you are eligible to participate:

- Community health, population health
- Health promotion/Prevention of illness
- Maternal child and pediatric courses
- Health Assessment

- Medical/Surgical Nursing
- Leadership/Management/Advocacy

Prior to the interview, you will be provided with a $10 Tim Horton's gift card as compensation for your time and effort. You will be offered an opportunity to review the transcript from your interview and given 7-10 days to respond should you feel the transcript does not accurately portray your thoughts. The timeframe expected to review the transcript is approximately one hour. I will compile and analyze all gathered information from your interview and the interviews of other participants and compose my thesis, highlighting the findings and providing recommendations for future nursing education. Your name will not be used in any study documents nor will your academic institution be identified. I will refer to the research site as an undergraduate Nursing Program located within Manitoba in either an urban, northern, or rural setting as it pertains to the participant

Upon completion of the study, I will provide you with an executive summary of the study's findings. Findings of the study will also be shared with educational administrators and your colleagues, it will be used for my master's thesis and published in academic nursing journals and presented at conferences.

If you are interested in hearing more about this study, please contact me and I will explain the study in further detail and answer your questions. If you decide to participate, you are asked to read, sign and return the attached Informed Consent form, and I will arrange an interview time that is convenient for you. If you decide not to participate, you can say no without any consequences. Participation throughout this study is completely voluntarily and you may stop at any time.

This research has been approved by the Education and Nursing Research Ethics Board at the University of Manitoba. If you have any concerns or complaints about this project, you may contact Jennifer Otto or the Human Ethics Coordinator (HEC) at 204- 474-7122 or by email at humanethics@umanitoba.ca

Thank you for your time and consideration for this study.

Sincerely,
Jennifer Lynn Otto, RN, BN, Graduate Student
College of Nursing, University of Manitoba
Email: umotto@myumanitoba.ca

Appendix D

UNIVERSITY OF MANITOBA

College of Nursing
Faculty of Health Sciences
Winnipeg, Manitoba
Canada R3T 2N2
Telephone: (204) 474-7452
Fax: (204) 474-7682

Interview Question Guide

SCRIPT: *"Before we start, I would like to remind you that the purpose of this study is to explore nurse educators' perceptions about ecoliteracy in undergraduate nursing programs. Ecoliteracy provides students with the knowledge required to understand and apply the principles of ecology, and also with the competencies required to address complex ecological concerns in a collaborative way."*

1. To what degree is ecoliteracy important for nursing students?
2. In what way(s) is/are ecoliteracy being developed or supported in your undergraduate nursing program?
    a. Are there formal objectives or course requirements addressing ecoliteracy in your course syllabi?
    b. If no, where do you see concepts supporting ecoliteracy fitting in?
3. In what way are ecoliteracy concepts currently delivered and evaluated in your undergraduate nursing programs?
    a. Can you provide an example of a method of content delivery?
    b. Can you provide an example of a method for the evaluation of learning?
4. What do you perceive as barriers to the inclusion of content that would support ecoliteracy in our undergraduate nursing programs?
    a. Can you provide an example of a time when you yourself experienced a barrier to including concepts supportive of ecoliteracy?
    b. If barriers exist, in what way are the barriers identified addressed?
5. If unable to act on the barriers what would you suggest be done to strengthen the integration of concepts which support ecoliteracy in undergraduate nursing programs?
    a. Is there a time you recall an innovative way of incorporating concepts, which are supportive of ecoliteracy, used to address one of the barriers mentioned?
6. Please describe your personal values related to concepts supporting ecoliteracy?
7. Are there any additional points you would like to make?
8. Do you feel satisfied with what was said during the interview?
9. Is there anyone else you could think of recommending for participation in this study?

Explain what will be done with the interview data and the research project as a whole. Ask whether they would like to see a transcript of the interview and confirm a summary of the project will be sent upon its completion.

Appendix E

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Canada R3T 2N2
Telephone: (204) 474-7452
Fax: (204) 474-7682

January 28, 2016

Informed Consent Form

Research Project Title: Nurse Educators' Perceptions of Ecoliteracy in Undergraduate Nursing Programs

Principal Investigator:
Jennifer Lynn Otto, RN, Graduate Student, College of Nursing, Faculty of Health Sciences, University of Manitoba
Email: umotto@myumanitoba.ca
Phone:

Thesis Committee members:
Dr. Benita Cohen, Associate Professor, College of Nursing, Faculty of Health Sciences, University of Manitoba (Advisor)
Email: Benita.Cohen@umanitoba.ca
Phone: 204.474.9936
Fax: 204.474.7682

Dr. Nicole Harder, Assistant Professor, College of Nursing, Faculty of Health Sciences, University of Manitoba
Email: Nicole_Harder@umanitoba.ca
Phone: 204.474.6714
Fax: 204.474.7682

Dr. Shirley Thompson, Associate Professor, Natural Resources Institute, University of Manitoba
Email: s.thompson@ad.umanitoba.ca
Website: Environmental Research
Phone: 204. 474.7170
Fax: 204.261.0038

Sponsor: Self-Funded
This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail

about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

Purpose of study

This is a thesis project by a graduate student to explore and understand common perceptions of nurse educators related to ecoliteracy in undergraduate nursing programs. Ecoliteracy provides students not only with the knowledge but also with the competencies required to address complex ecological concerns in a collaborative way. Ecoliteracy provides students the ability to integrate concepts of sustainability into professional practice issues promoting an ecocentric professional (Goleman, Bennet & Barlow, 2012). Ecoliteracy is more than having the knowledge required to identify and list components of the environment. It is the ability to participate in informed decision-making (Locke, Russo & Montoya, 2013). With growing concerns related to global warming, climate change and additional environmental health issues, all health care providers will require some degree of ecoliteracy to support the health of Canadians into the future. However, there is little evidence regarding the level of ecoliteracy among nurses in Canada, or the extent to which Canadian nursing programs promote ecoliteracy. How nurse educators perceive concepts of ecoliteracy within undergraduate nursing programs and the perceived barriers to the inclusion of such content is required to inform curricula change.

Study Procedures

In this study, you, as a Nurse Educator, are being asked to participate in a telephone interview. The duration of the interview is estimated to be about one hour. A set of semi-structured questions will be used as a guide to direct the discussion. During the interview, our discussion will be audio recorded using a telephone recording device. You will be asked questions about your experiences with ecoliteracy within undergraduate nursing education. The researcher will write reflective notes during and after the interview to document the interview process. The reflective notes would contain information such as questions that arise during the interview or ideas generated as a result of the participant's response. The audio-recording will be transcribed word for word. I will refer to your place of employment as a Bachelor of Nursing Program located within Manitoba either large Urban, small Urban, or Northern. You will be offered an opportunity to review the transcript from your interview and given 7-10 days to respond should you feel the transcript does not accurately portray your thoughts. The timeframe expected to review the transcript is approximately one hour. An audit trail will be available to show examples of how data was interpreted and synthesized. All information, both audio-recorded and study documents will be treated with confidentiality. For example, all names and identifying features will not be contained in any research reports. All transcribed documents (no names or identifying features) will be stored on the University of Manitoba's H:Drive then uploaded onto a qualitative research software program that is located on the principal investigators office computer. Audio–recordings will be kept on the University of Manitoba's H:Drive. Any additional documents – hand written journal notes, consent forms (hardcopy)-- will be kept in a locked cabinet in the principal investigators office. If documents are to be shared with Dr. Benita Cohen (my thesis supervisor), they will be transferred onto a password-protected USB.
I will refer to the place of employment as a Bachelor of Nursing Program located within Manitoba – either larger urban, small urban or Northern.

Risks and Discomforts
There is minimal risk or anticipated discomforts to participating in this study. Although direct quotes of statements you make during the interview may be used in a final report, no identifiable information will be linked with the statements. Although no names or identifying information will be used in a final report it is possible you could be indirectly identified through the sample selection process; the academic institutions are identified as (large urban, small urban, and Northern). Due to the limited number of individuals that meet the inclusion criteria at the participating schools it may be possible to presume that particular individuals have participated.

Benefits
There are no personal benefits to participating in this study. Participating in this study will provide you with an opportunity to make a contribution towards evidence-based understanding of undergraduate nurse educators' perceptions of ecoliteracy. The information gathered from this study has the potential to support recommendations for addressing those barriers and strengthening ecoliteracy within undergraduate nursing curricula in Manitoba.

Compensation
Upon receipt of you completed informed consent, you will be mailed a $10 Tim Horton's gift card to compensate for your time. Should you decide to withdraw from the study, you may keep the card.

Voluntary Participation/Withdrawal from the study
Your decision to take part in this study is voluntary. Consent is ongoing, meaning if changes occur to the research project, you will be made aware of those changes and may refuse to participate or you may withdraw from the study at any time or refuse to answer any individual questions with no negative consequences. To withdraw from the study, inform the PI via email or telephone (umotto@myumanitobca.ca, [redacted]) and your interview transcript and any corresponding data will be deleted. You have a maximum of 30 days from the time your transcript is approved for accuracy to withdraw from the study.

Confidentiality
Once your consent has been received by the principal investigator you will be assigned a "participant code". The code will consist of a letter, representing the academic institution/region--(A) Small urban, (B) Large urban, and C) Northern)—and then each participant will be sequentially numbered under their appointed academic institution. For example, participant #1 from Small urban would receive B1 as a participant code, participant #2 would receive B2 as a participant code, and so on. The principal investigator will hold a master copy of the participant codes.
The transcriptionist will be provided audio files that include the assigned participant code for identification purposes. The transcriptionist will be asked to sign a pledge of confidentiality that s/he will not discuss the contents of the interview with anyone other than the researcher or the researcher's advisor.
Once the transcription is complete, the transcriptionist will give the password protected electronic transcript files to the researcher and will not keep any copies of any study files. All transcribed documents (no names or identifying features) will then be uploaded onto the

University of Manitoba's H:Drive as well as NVivo (a qualitative research software program) that is located on the principal investigator's office computer.

All study data (digital recordings, transcripts, electronic journal notes, consent forms, audit trail) will be stored on the University of Manitoba's H: Drive, accessible only to the researcher. In the event that information sharing with Dr. Benita Cohen (Thesis Advisor) is required, files will be kept on a password protected USB and will be destroyed when the study is completed, according to the University of Manitoba's policy for destruction of confidential material. All study data will also be kept on the University of Manitoba's H:Drive, only accessible to the researcher. Electronic files on the University of Manitoba's H:Drive will be deleted permanently after seven years(10/22) . All raw data or documents related to the interview will be kept in a locked, secure room for the required seven years, and then will be destroyed after 10/22. Information gathered in this research project may be published or presented in public forums. However, your name and other identifying information such as the specific name of the educational institution will not be used or revealed.

Results of the study

Upon completion of the study (May 2016), an executive summary of the study's findings will be provided to participants. Findings of the study will also be shared with educational administrators and additional faculty from each academic site and will be submitted for publication in academic nursing journals and presented at the Western & Northwestern Region Canadian Association of Schools of Nursing conference in the form of a poster or oral presentation. Additional dissemination opportunities might exist within the Canadian Nurses Association special interest group, 'Canadian Nurses for Health and the Environment.' The data may use individual participant's quotes that are free from individual identifiers.

The intended purpose of the study is to make a contribution towards evidence-based understanding of undergraduate nurse educators' perceptions of ecoliteracy. The information gathered from this study has the potential to support recommendations for addressing those barriers and strengthening ecoliteracy within undergraduate nursing curricula in Manitoba.
If you would like to receive a mailed or emailed copy please provide your address (mail or email) in the space below.

Address: _____

_____

_____

_____

Email Address: _____

Please indicate if I may contact you by email to ask you to review your transcript for accuracy.
YES NO

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you

prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way. This research has been approved by the Education and Nursing Research Ethics Board at the University of Manitoba. If you have any concerns or complaints about this project, you may contact the Human Ethics Coordinator (HEC) at 204- 474-7122 or by email at humanethics@umanitoba.ca . A copy of this consent form has been given to you to keep for your records and reference.

Print the emailed consent form, review and complete the document, scan the signed document and return the document by email to the principal investigator, Jennifer Otto, at umotto@myumanitoba.ca,

Participant's name (please print):_____

Participant signature _____Date _____
(Day/Month/Year)

Researcher's signature_____

Appendix F

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Canada R3T 2N2
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Nurse Educators' Perceptions of Ecoliteracy in Undergraduate Nursing Programs
Transcriptionist's Oath of Confidentiality

I understand that the digital audio-recordings given to me to transcribe are data from a research project and that according to ethical principles of the research process, I am bound to uphold the confidentiality of the research process. This means that I will keep confidential all matters pertaining to the identity of the participants involved in the project. I will discuss the research project only with the researcher and keep confidential all matters associated with this process.

During the course of the transcription of the interview recordings, in order to maintain confidentiality, I will refer to the participants and any other individuals mentioned by pseudonym only. I understand that participant's names are not to appear on any transcribed data. Upon completion of my work on this project, I will return all research data to the researcher and will not keep any electronic or hardcopies of the transcripts or recordings.

Transcriber…….

Witnessed by Researcher…….

Date……..