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Impacting Positive Breastfeeding Attitudes of Prelicensure Nursing Students Using an Evidence-based Breastfeeding Module

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IMPACTING POSITIVE BREASTFEEDING ATTITUDES OF PRELICENSURE
NURSING STUDENTS USING AN EVIDENCE-BASED BREASTFEEDING MODULE

by

Stephanie D. Uhr

A Dissertation Submitted in
Partial Fulfilment of the
Requirements for the Degree of

Doctor of Philosophy
in Nursing

at

The University of Wisconsin – Milwaukee

August 2022

ABSTRACT

IMPACTING POSITIVE BREASTFEEDING ATTITUDES OF PRELICENSURE NURSING STUDENTS USING AN EVIDENCE-BASED BREASTFEEDING MODULE

by

Stephanie D. Uhr

The University of Wisconsin – Milwaukee, 2022
Under the Supervision of Professor Teresa S. Johnson

Background: Robust evidence demonstrates optimal breastfeeding behaviors provide unmatched short- and long-term health outcomes. Therefore, breast milk feeding is more than a feeding decision; it is a significant public health concern. Breast milk is species-specific nutrition for a developing infant. The health impact of providing breastmilk extend to the lactating parent. However, the existing breastfeeding education is often inadequate to support the care of the breastfeeding dyad. The dissertation examines the role breastfeeding plays in prelicensure nursing education and analyzes the use of an evidence-based breastfeeding educational module (EBBM) on breastfeeding attitudes.

Method: An integrative review analyzed the current state of breastfeeding education for prelicensure nursing students. An evidence-based breastfeeding educational module (EBBM) was developed and evaluated using a quasi-experimental study design. The study used a pretest-posttest approach and was conducted in two university settings examining the breastfeeding attitudes of prelicensure nursing students (PNS).

Results: The Iowa Infant Feeding Attitude Scale (IIFAS) measured the breastfeeding attitudes of the PNS. A statistically significant increase was found between pretest

breastfeeding attitude of PNS to posttest breastfeeding attitude ($t = 11.761$, $df = 72$, $p < .001$].

Conclusion: The EBBM based on the United States Breastfeeding Committee (USBC) Core Competencies in Breastfeeding Care for All Healthcare Providers effectively improved the positive attitudes of PNS in the study sample. The study's findings establish a viable educational intervention to impact the breastfeeding education of PNS. The implementation of a standardized breastfeeding education can be achieved by the nursing program accreditation organization. The systematic approach can require the inclusion of vital breastfeeding instruction. Nurses are uniquely positioned to impact the care of the breastfeeding dyad in all healthcare settings.

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DEDICATION

This dissertation is dedicated to all those in my life that helped me achieve this mighty goal and gave me the support I needed to be efficient and dedicate so much of my time to this journey.

To my husband, Alex, your love, support, and confidence in my ability to accomplish this got me through the challenges along the way. To my children, Andre and Kyra, your patience and love helped remind I could achieve my goal and still be a good mom. Kyra, the connection we shared when we both collected and analyzed data, you with your AP Capstone project and me with my dissertation study, will forever be a favorite memory.

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Chapter 1

Introduction

Problem and Significance

Breastfeeding an infant provides numerous health benefits, including reducing the overall neonatal and infant morbidity and mortality risk worldwide (World Health Organization [WHO], 2021). Researchers have reported that practicing optimal breastfeeding behaviors worldwide would prevent an estimated 823,000 child deaths and save an estimated \$300 billion in healthcare costs (WHO, 2021; Mullan, 2015; Victoria et al., 2016; Rollins et al., 2016). Therefore, breastfeeding is considered a worldwide health concern, with multiple countries and organizations supporting substantial initiatives and detailed procedures that advocate for breastfeeding globally. The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) lead worldwide strategies to increase breastfeeding initiation, exclusivity, and duration rates. In addition, WHO and UNICEF provide detailed recommendations for optimal feeding practices for breastfeeding dyads worldwide. Optimal breastfeeding implies breastfeeding initiation within the first hour of birth, exclusive breastfeeding for the first six months of life, and continued breastfeeding up to 2 years of age or more (WHO, 2021, para. 2). Documented health benefits of breastfeeding for infants include decreased risk of respiratory tract and gastrointestinal infections, necrotizing enterocolitis (NEC), Sudden Infant Death Syndrome (SIDS), allergic disease, asthma, obesity, diabetes, and childhood cancers such as leukemia (American Academy of Pediatrics [AAP], 2012; Victora et al., 2016; U.S. Department of Health and Human Services [USDHHS], 2020; Health Resources and Services Administration [HRSA],

2020). Breastfed infants also experience beneficial neuro-developmental outcomes such as increased IQ, and preterm infants experience both short and long-term neuro-developmental protection (AAP, 2012; Victora et al., 2016).

Lactating parents who breastfed their babies experience health benefits, potentially by a cumulative length of breastfeeding, such as the reduced risk of postpartum bleeding, breast and ovarian cancers, type 2 diabetes, obesity, and rheumatoid arthritis (AAP, 2012; Victoria et al., 2016). In addition, Tschiderer et al. (2022) demonstrated a relative risk reduction for all cardiovascular disease (CVD) outcomes in their recent systematic review and meta-analysis. Accordingly, healthcare-based and public health organizations regards breastfeeding as less a lifestyle choice for the lactating parent and a more vital public health concern (AAP, 2012; WHO, 2021; CDC, 2021).

Prevalence

A lactating parent's decision to breastfeed is a complex phenomenon influenced by physical (both maternal and birth interventions), social, and psychological components. The current breastfeeding initiation rate is at 83.9% in the United States, demonstrating that most parents decide to breastfeed their infants (Centers for Disease Control [CDC], 2021). However, as many as 60% of lactating parents cannot meet their own breastfeeding goals regarding breastfeeding initiation, exclusivity, and duration (Odom et al., 2013; Sriraman & Kellams, 2016; Rollins et al., 2016). In addition, social and physiological factors such as the healthcare provider's education and support in the prenatal period affect both initiation, duration, and exclusivity of breastfeeding (Odom et al., 2013; Sriraman & Kellams, 2016; Victoria et al., 2016; Rollins et al., 2016).

Conversely, some lactating parents who meet their goals have prior education and support, regardless of external factors.

While the overall average of breastfeeding initiation may be above 80%, there are significant disparities between numerous areas of the United States. A substantial decrease in specific geographic regions demonstrates the continued need for breastfeeding support, education, and promotion (CDC, 2021). For example, the current rate of “any” breastfeeding in the states of Washington is 95.1%, whereas West Virginia and Mississippi are at 63.0% and 68.0%, respectively (CDC, 2021). A substantial percentage of lactating parents do not have support, with a higher proportion occurring within vulnerable populations of lower socioeconomic levels and racial/ethnic backgrounds. The absence of support heightens the inequities in breastfeeding rates (Odom et al., 2013; Sriraman & Kellams, 2016; Rollins et al., 2016). The intersectionality of race, gender, and income level worsen the disparities in breastfeeding rates between racial groups (Walsh, 2012; Beauregard et al., 2019).

Researchers demonstrate a gap in the knowledge and attitudes of nurses and other healthcare providers that translate into ineffective support for lactating parents (Ahmed et al., 2011; Rollins et al., 2016; Boyd & Spatz, 2013; Bozzette & Posner, 2013; Cianelli et al., 2014; Davis & Sherrod, 2015; Folker-Maglaya et al., 2018; Folker-Maglaya et al., 2020; Linares et al., 2018; Pajalic, 2014; Rhodes & Burgess, 2018; Yang et al., 2019; Vandewark, 2014). A primary strategy is to strengthen efforts to educate healthcare workers, especially front-line care providers such as nurses, to support new lactating parents. Nurses make up a significant part of the healthcare team and are uniquely positioned to impact breastfeeding practices (Sriraman & Kellams, 2016;

Odom et al., 2013). When health care providers provide a targeted focus with a systematic approach, this can influence breastfeeding practices of lactating parents of all ages, socioeconomic, and racial/ethnic groups (USDHHS, 2011). The U.S. Surgeon General issued a call to action to recommend expanding breastfeeding content in educational programs for nurses and other healthcare professionals to impact the level of care provided to a breastfeeding dyad (USDHHS, 2011). The continued lack of standardized breastfeeding education decreases nurses' ability to promote and support breastfeeding as normative infant feeding practice for all families and impacts health outcomes (Ahmed et al., 2011; Campbell et al., 2022).

Purpose

Nurses are uniquely positioned to influence breastfeeding practices due to interactions with lactating parents and infants in all health care settings. Initiatives to increase breastfeeding rates hinge on the abilities of nurses to promote, educate, and support lactating parents with breastfeeding, thereby increasing breastfeeding initiation and continuation (Lopez-Peña et al., 2020). Thus far, researchers report that a lack of education and support are critical factors in the inadequate breastfeeding rates for initiation, inclusivity, duration. (USDHHS, 2011; Lopez-Peña et al., 2020). One of the factors known to impact breastfeeding initiation, exclusivity, and duration is provider support directed to the breastfeeding dyad in the healthcare setting (USDHHS, 2011; WHO, 2021). Despite some progress, the United States falls short of the breastfeeding goals set forth by the CDC, U.S. Surgeon General, and the World Health Organization (USDHHS, 2011; Healthy People 2020, 2020; WHO, 2021). The current Healthy People 2030 metrics target two breastfeeding-specific goals. The first goal is to increase the

current rate of 24.9% for breastfeeding exclusively at six months to 42.4% (MICH-15). The second goal is to increase the overall percentage of breastfeeding babies at one year of age (MICH-16). The current rate is 35.9% at one year of age but the goal is set at 54.1% (USDHHS, 2020).

In the first hours of life, breastfeeding initiation is positively associated with knowledgeable healthcare workers and the lactating parent's self-efficacy (Lau et al., 2018). Researchers point to support from healthcare workers and family and friends as a substantial component of lactating parents' self-efficacy (Lau et al., 2018; Linares et al., 2018; Bozzette & Posner, 2013). **All** nurses have the potential to care for a breastfeeding dyad in any care area (Bozzette & Posner, 2013; USDHHS, 2011; Lopez-Peña et al., 2020; Linares et al., 2018). Therefore, a significant effort must be coordinated to educate **all** prelicensure nursing students on how optimal breastfeeding impacts health. The targeted educational measure will expand lactating parent's support in **all** healthcare areas. In addition, the emphasized breastfeeding education and support can augment breastfeeding initiation, duration, and exclusivity rates in multiple healthcare facilities and units caring for lactating parents and their infants.

Theoretical Framework

Ajzen's (1991) Theory of Planned Behavior (TPB) served as the theoretical underpinning examining nursing students' attitudes and knowledge about breastfeeding. TPB posits that behavior is primarily guided by **intent**. The TBP has been used to explain and predict behaviors in healthcare and multiple other disciplines (Ajzen, 2020). For example, researchers have used the TPB to explain breastfeeding intent and examine factors that can improve breastfeeding rates (Jefferson, 2013; Lau et al., 2018;

Bai & Dinour, 2017; Bai et al., 2011; Guo et al., 2016; Zhu et al., 2014). The TPB predicts the person's **intent** towards a particular behavior based upon three components: 1) *attitude* (A) toward the behavior, demonstrating a more positive attitude increases intent; 2) *subjective norm* (SN) concerning the behavior, with more favorable societal expectations increasing intent; and 3) the *perceived behavioral control* (PBC), signifying increasing control increases intent (Ajzen, 1991; Jefferson, 2013). Guo et al. (2016) posit that using TPB as an outline to develop positive attitudes about breastfeeding, framing breastfeeding as the accepted societal norm, and enhancing the perceived behavioral control to promote breastfeeding can be used for supportive breastfeeding practices.

This study used a conceptual model illustrating nursing students breastfeeding attitudes based on the TPB's three central tenets to explore and visualize the theory's application and feasibility (Figure 1.1). The first tenet of *Attitude* relates to the negative or positive attitude a nursing student has about breastfeeding. The second tenet of *Subjective norm* centers on the student viewing breastfeeding as the normative infant feeding method. The critical element of societal acceptance is included to promote the normative nature of breastfeeding. The third tenet of *perceived behavioral control* correlates with increased breastfeeding knowledge will enhance the students' belief in their ability to assist the breastfeeding dyad. Therefore, the three facets of the TPB can increase the students' **intent** to care for the breastfeeding dyad by educating, promoting, and supporting breastfeeding. The conceptual model also incorporated additional variables that can have a mediating or moderating effect on the intent of promoting evidence-based breastfeeding behavior. Nurses are expected to provide

interventions based on science and not on personal or familial experiences. Examining the demographic data was important to explore any relationships with intent and guide education and initiatives to increase care provided by nursing students.

Positive attitudes or beliefs created from evidence-based information can result in behavioral intention (Ajzen, 1991; Linares et al., 2018). Therefore, an evidence-based breastfeeding module (EBBM) based on the United States Breastfeeding Committee (USBC) Core Competencies in Breastfeeding Care and Services for all Health Professionals (Appendix B), underpinned by the TPB, will empower nursing students to provide breastfeeding care grounded in science. Furthermore, this newfound knowledge will impact their intent to promote breastfeeding. The aims of the study were to: 1) create an evidence-based breastfeeding module (EBBM) based on the USBC's Core Competencies in Breastfeeding Care and Services for all Health Professionals; and 2) to evaluate the effectiveness of the evidence-based breastfeeding module (EBBM) with prelicensure nursing students.

Research Questions

1. Is there a difference in the undergraduate prelicensure nursing students breastfeeding attitude before (pretest score) and after (posttest score) participating in the evidence-based breastfeeding module (EBBM)?
2. What is the relationship between the prelicensure nursing student's breastfeeding awareness level and pretest breastfeeding attitude score?
3. Is there a relationship between age, gender identity, race/ethnicity, and country of birth and the pretest breastfeeding attitude score among prelicensure nursing students?

4. What is the relationship between the pretest breastfeeding attitude scores and posttest breastfeeding attitude scores of the two groups (Group 1 - Illinois cohort, group 2 - Wisconsin cohort)?

Methods

This study examined the attitudes of prelicensure nursing students towards breastfeeding before and after an evidence-based breastfeeding module (EBBM). The study was a quantitative inquiry using a quasi-experimental design. The pretest and posttest surveys were administered using the online Qualtrics platform. The evidence-based breastfeeding module (EBBM) was constructed from the curriculum based on the USBC (2010) Core Competencies in Breastfeeding Care and Services for all Health Professionals (Appendix B). Data from different demographic populations was achieved using two university settings to increase diversity and the generalizability of the findings. One university is in a rural area of northern Illinois, and the second university is in an urban community in southern Wisconsin.

The study intended to address gaps in the current literature examining prelicensure nursing students breastfeeding education by combining a curriculum based on current evidence-based practice guidelines and deploy it in multiple university settings. Two university settings were included to expand the scope of the populations sampled. In addition, further exploration of the demographic variables was included in the analysis to determine the relationship with the students' pretest attitude.

Impact on Nursing Discipline

Researchers continue to report that the breastfeeding education of nursing students lacks standardized content (Campbell et al., 2022; Yang et al., 2018).

Therefore, applying the USBC (2010) Core Competencies to the evidence-based breastfeeding module (EBBM) provided a framework for the nursing students addressing the needed knowledge, skills, and attitudes to care for the breastfeeding dyad. The USBC's Core Competencies focus on the lactation process, supporting the breastfeeding dyad in the healthcare setting, and awareness of substantial barriers that impede optimal breastfeeding practices. The knowledge gained will assist the breastfeeding dyad and increase awareness of the inequities in maternity care.

The maternal breastfeeding decision-making process is complex and is often more involved than increasing education and understanding of overall health. Lactating parents decide to breastfeed based on support and other factors outside the realm of their knowledge base (Snyder et al., 2020; Hawkins et al., 2017; Fisher et al., 2014). In addition, researchers report those various barriers affect successful breastfeeding. A significant percentage of the barriers relate to the social determinants of health (SDOH) and persistent racial disparities arising from implicit bias and structural racism (Antsey et al., 2017; Bartick et al., 2017; Beauregard et al., 2019; Jones et al., 2015; Reeves & Woods-Giscombé, 2015; Safron et al., 2021; Spencer & Grassley, 2013).

A critical aspect of breastfeeding practices is lactating parent's intent and breastfeeding initiation in the immediate postpartum period (Beauregard et al., 2019). Along with intent, numerous social and societal factors impede optimal breastfeeding practices, such as healthcare policies, socioeconomic level, and lack of support from family, friends, and societal norms. Increasing a lactating parent's intent by providing education and bedside support to initiate breastfeeding is the first step to increasing breastfeeding exclusivity and long-term commitment to providing breast milk for infants

(Fischer & Olson, 2014). Complications with lactating parent's intent relate to a decreased effort to promote and support a lactating parent, especially African American/Black people, at the bedside due to insufficient education and support (Beauregard et al., 2019). Many lactating parents face barriers to quality of care, access to care, and adequate education and support beginning in the antepartum period and postpartum. Most African American/Black lactating parents are aware of the breastfeeding benefits to their infants but are not supported in the decision-making process prenatally or after delivery. Therefore, focusing efforts to increase education will not impact the breastfeeding disparities (Spencer & Grassley, 2013; Reeves & Woods-Giscombé, 2015). Overarching goals must focus on nurses' support, breastfeeding supportive systemic policies, and peer support in the community and healthcare facilities to normalize breastfeeding practices.

The evidence-based breastfeeding module (EBBM) constructed from the USBC Core Competencies in Breastfeeding Care and Services for All Health Professionals that includes racial/ethnic and cultural awareness allowed students to see the existing support structures and how the SDOH impact breastfeeding practices for racial/ethnic groups and vulnerable populations of low socioeconomic status (USBC, 2010). The EBBM also provided information regarding the contradictory messages and information new lactating parents face, such as the abundant marketing of infant formula in the United States (Reeves & Woods-Giscombé, 2015). The healthcare domain must promote, educate, and support breastfeeding as the normative method for infant feeding. The knowledge, skills, and attitudes in the USBC's Core Competencies may promote a heightened sense of advocacy, potentially affecting the students' desire to

provide correct information and support to the breastfeeding dyad. The impact of positive attitudes or beliefs created from evidence-based information can result in behavioral intention (Ajzen, 2020; Linares et al., 2018). Therefore, the ultimate goal of the EBBM is to increase breastfeeding rates as well as bring awareness to the racial disparities that many lactating parents face, the lack of societal acceptance of breastfeeding as the normative feeding practice, and the numerous barriers related to the SDOH.

Organization of the Dissertation and Manuscript Placement

This introduction represents Chapter one and provides an overview of the complete dissertation. The theoretical framework of the Theory of Planned Behavior (TPB) described can be seen threaded throughout the dissertation chapters. Chapter two presents an integrative review of the literature examining the current state of breastfeeding education for prelicensure nursing students. The integrative review followed PRISMA guidelines and reflected both qualitative and quantitative studies. The integrative review serves as the primary manuscript. Chapter three, the secondary manuscript, presents the methodology and results of the dissertation research that examines the use of the evidence-based breastfeeding module (EBBM). Chapter four describes a feasible policy design to impact breastfeeding education of prelicensure nursing students and therefore the overall health of lactating parents and their infants. Finally, chapter five concludes with a summation of the literature review, synthesis of the findings from the quantitative study, policy recommendations, and future guidance for research. The content and organization of the dissertation and the consequent manuscripts are described in Table 1.1.

Conclusion

The dissertation intended to assess the content and quality of breastfeeding education for prelicensure nursing students. The findings from this dissertation will contribute to advancing the state of nursing education concerning breastfeeding. Nurses make up the majority of the healthcare workforce and have the potential to impact patient care and lifelong outcomes through the education they receive. The manuscripts constructed from this dissertation will be submitted for publication to the targeted journals listed in Table 1.1.

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Figure 1.1

The Theory of Planned Behavior Framework

Prelicensure Nursing Students Breastfeeding Attitude
Based on the Theory of Planned Behavior (Ajzen, 2020)

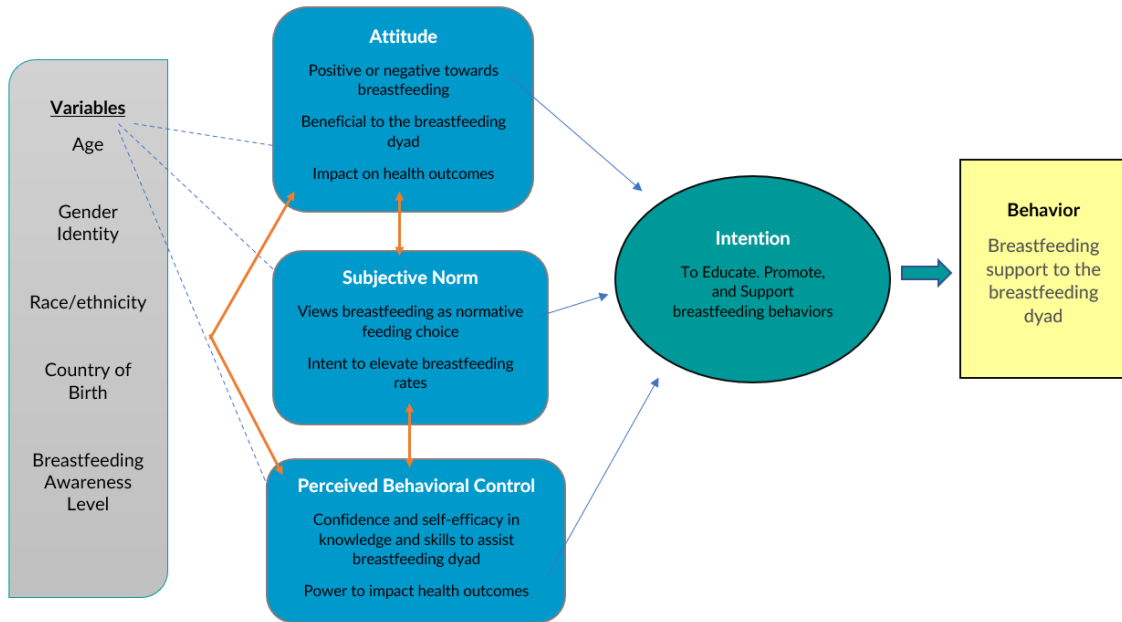


Table 1.1**Chapters and Manuscript Placement with Target Journals**

	Title	Aim	Target Journal(s)
Chapter 1	Introduction	To introduce the dissertation	n/a
Chapter 2 ~ Manuscript 1	Suboptimal Breastfeeding Education of Prelicensure Nursing Students – An Integrative Review	To report the findings of the current literature of breastfeeding education with prelicensure nursing students.	<ul style="list-style-type: none"> • Journal of Nursing Education * • Nurse Educator • Journal of Nursing Scholarship
Chapter 3 ~ Manuscript 2	Increasing Positive Breastfeeding Attitudes Using an Evidence-Based Module for Prelicensure Nursing Students	Study Methods and Result paper	<ul style="list-style-type: none"> • Nurse Educator * • Journal of Nursing Education
Chapter 4 ~ Manuscript 3	Optimizing Care for the Breastfeeding Dyad - A Human Milk Feeding Education Policy	Policy paper	<ul style="list-style-type: none"> • Journal of Professional Nursing* • Maternal and Child Health Journal • The American Journal of Maternal / Child Nursing (MCN) • Journal of Obstetric and Neonatal Nursing (JOGNN)
Chapter 5	Conclusion	To conclude the dissertation	n/a
* = current manuscript format			

Chapter II: Literature Review

The purpose of this chapter is to present the current state of the science on breastfeeding education in prelicensure nursing programs. The prelicensure nursing student (PNS) population was chosen because educating on the health impact of breastmilk can translate into each person's nursing practice. In addition, the literature review reveals the gap in research relating to standardized breastfeeding education for the entry-level nurse. The manuscript has been formatted to the Journal of Nursing Education specifications and will be submitted for publication in fall 2022.

Abstract

Background: Providing breastmilk to a newborn infant is the gold standard for infant nutrition. The impact on the newborn's health extends past infancy into young childhood, and beyond. Even more vital is the impact on maternal health. Robust evidence demonstrates that short- and long-term health is improved by lactation. The article examines the breastfeeding attitudes of prelicensure nursing students (PNS).

Method: An integrative review was completed using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Sources analyzed the current state of breastfeeding education for prelicensure nursing students (PNS).

Results: Twenty-four papers were extracted and reviewed from four databases, CINAHL, Web of Science, ERIC, and PubMed. The results demonstrated numerous small-scale interventions improve breastfeeding education but lack standardization.

Conclusion: There is a dearth of standardized breastfeeding elements in prelicensure nursing programs. Enhanced and comprehensive education for all nursing students is needed to impact the overall health of lactating parents and infants.

Background

Providing breast milk is essential to short- and long-term health outcomes of lactating parents and infants, thereby reducing the overall neonatal morbidity and mortality risk worldwide (Victora et al., 2016; WHO, 2020). Optimal breastfeeding practices could annually save the lives of 820,000 children under the age of five and nearly \$300 billion in economic savings (World Health Organization [WHO], 2020). The known health impacts of breastfeeding for infants includes decreased risk of the respiratory tract and gastrointestinal infections, necrotizing enterocolitis (NEC), Sudden Infant Death Syndrome (SIDS), allergic disease, obesity, diabetes, and childhood cancers (American Academy of Pediatrics [AAP], 2012; Victora et al., 2016). In addition, breastfed infants experience valuable neuro-developmental outcomes and increased I.Q. (AAP, 2012). The vulnerable population of preterm infants specifically experiences increased short and long-term neuro-developmental protection (AAP, 2012; Victora et al., 2016). A lactating parent's health benefits vary from reduced postpartum bleeding to decreased type 2 diabetes, obesity, and breast and ovarian cancer. Furthermore, breastfeeding mitigates the manifestation of the lactating parent's cardiovascular disorders and rheumatoid arthritis (AAP, 2012; Victora et al., 2016; Tschiderer et al., 2022). Accordingly, the American Academy of Pediatrics (2012) considers breastfeeding a public health concern rather than a lifestyle choice (AAP, 2012).

The fundamental goal of numerous healthcare-based organizations is to improve breastfeeding rates. However, those rates are deficient, primarily when examined for disparities in racial and ethnic groups (WHO, 2020; Lau et al., 2018; U.S. Department of Health and Human Services [USDHHS], 2011; USDHHS, 2020; Beauregard et al.,

2019). Researchers have reported several instances where healthcare providers (HCP) failed to provide equitable education and support for childbearing families regarding how breastfeeding can impact maternal and infant health (Antsey et al., 2017; Jefferson, 2013; Reeves & Woods-Giscombé, 2015). The lack of HCP breastfeeding support and existing societal barriers affect establishing and maintaining lactation (Jones et al., 2015). The expansion of breastfeeding education can long-term impact overall health, especially within at-risk populations (Walsh, 2012).

All HCP must be educated to provide front-line support for the breastfeeding parent-infant dyad in all healthcare settings to promote optimal breastfeeding practices. Several researchers reported that educational modules with multiple elements containing evidence-based information revealed an improved level of knowledge and positive attitudes towards breastfeeding (Bozzette & Posner, 2013; Cianelli et al., 2014; David & Sherrod, 2015; Folker-Maglaya et al., 2018; Lopez-Peña et al., 2020; Rhodes & Burgess, 2018; Vandewark, 2014; Yang et al., 2019). In addition, a substantial factor known to impact breastfeeding initiation, duration, and exclusivity is HCP support in the preconception, prenatal, and the postpartum period for the breastfeeding dyad (USDHHS, 2011; WHO, 2020).

Nurses make up a significant part of the healthcare environment and can impact breastfeeding practices worldwide (Sriraman & Kellams, 2016; Odom et al., 2013). Unfortunately, many nursing students and other healthcare providers receive inadequate education on the core competencies for HCP for breastfeeding support. In addition, the education HCP received often lacked the impact of breastfeeding on health outcomes and preparation to promote and support breastfeeding as normative infant

feeding practice for all families (Ahmed et al., 2011; Campbell et al., 2022). Therefore, this literature review aims to assess the current breastfeeding curricula for prelicensure nursing students (PNS).

Method

Inclusion Criteria

The Preferred Reporting Items for Systemic Reviews and Meta-Analyses (PRISMA) guidelines were employed with electronic databases to conduct this integrative literature review (Page et al., 2021). The databases examined were the Cumulative Index of Nursing & Allied Health Literature (CINAHL), Education Resources Information Center (ERIC), the Web of Science, and PubMed databases. Inclusion criteria were: 1) quantitative, qualitative, or mixed methods studies that examined prelicensure nursing students' education of breastfeeding content; 2) peer-reviewed sources; 3) conducted in the United States; 4) published between 2000 – 2021. Exclusion criteria were: 1) a primary focus on nursing students outside of prelicensure programs; 2) focused on HCP outside of the nursing discipline; and 3) conducted outside of the United States.

Search Strategy

The search strategy and identification of potential keywords resulted from an initial cursory search of CINAHL. The keywords and subject headings searched in combination consisted of "breastfeeding, breast feeding, or lactation" and "nursing students," "student nurses," "prelicensure," "undergraduate nurses," "baccalaureate nursing programs." An additional search included adding "education or teaching" to the above search strategy. The search strategy of the four databases of CINAHL, ERIC,

PubMed, and Web of Science yielded 180 sources. See the PRISMA flow diagram in Figure 2.1. There were 40 duplicate sources removed from the initial screening process. The remaining 140 sources were screened using titles and abstracts for inclusion criteria that focused on breastfeeding education of PNS. As a result, 92 sources were excluded based on a focus outside of the PNS population, studies conducted outside of the United States, and an educational concentration outside breastfeeding content. A full-text review was conducted on the 48 remaining sources for inclusion in the final integrative review. A total of 24 sources remained that met inclusion criteria (see Table 2.1). A systematic review and a scoping review were kept for analysis and included in the total sources.

Results

The details of the 19 studies included in the review are displayed in Table 2.1. The table includes one mixed-method study (Vandewark, 2014) and four qualitative studies (Rhodes & Burgess, 2018; Cricco-Lizza, 2006; Webber et al., 2021; Yang et al., 2019). Multiple researchers included pre/post-test questionnaires in their quantitative design with an educational module. Some researchers measured the learning in the clinical setting by collecting data before and after the maternal-infant clinical rotation (Yang et al., 2019; Vandewark, 2014). Three studies tested innovative techniques such as audiovisual and online elements (Bozzette & Posner, 2013; Cianelli et al., 2014), the use of a standardized patient (Davis & Sherrod, 2015), and high-fidelity simulation (Yang et al., 2019).

This integrative review included one systematic review and one scoping review (Campbell et al., 2022; Yang et al., 2018). The systematic review by Yang et al. (2018)

and the scoping review by Campbell et al. (2022) compile multiple sources from 21 to 39 years. The research highlighted key elements that increase knowledge retention and improve attitudes toward breastfeeding for nursing students. For example, much of the research demonstrated that lecture-based modules effectively increased breastfeeding knowledge in a small scope but lacked a standardized curriculum (Ahmed et al., 2011; Cianelli et al., 2014; Linares et al., 2018).

The ethical concerns of not including breastfeeding education within the nursing curriculum influences the lack of randomized control trials (RCT) in breastfeeding education with nursing students. The National Council of State Boards of Nursing (NCSBN) and the NCLEX Detailed Test Plan necessitate maternity care and infant feeding education requirements in nursing curricula (Ahmed et al., 2011; NCSBN, 2021). Multiple studies reviewed have a quantitative methodology where one group of students participated in the standard educational lecture. The second group participated in the experimental group, which utilized the same standard lecture-based module but with an additional educational element (Bozzette & Posner, 2013; Cianelli et al., 2014; Davis & Sherrod, 2015; Dodgson & Tarrant, 2007). removed the sentence that was here, it did not add anything

Four themes emerged among the quantitative and qualitative sources evaluated. The systematic review and scoping review supported the same themes. The first theme noted was a lack of a standardized breastfeeding curriculum that employed current evidence-based practice guidelines. The second theme was that frequent small sample sizes and distinct geographic areas were prevalent, and often only one nursing program was studied, which limited generalizability (Campbell et al., 2022). The third theme

provided measures to increase breastfeeding education time allotted in the classroom, with or without an innovative element, which increased breastfeeding knowledge and attitudes (Yang et al., 2018; Campbell et al., 2022). Finally, the fourth theme revealed that most nursing students understood that breastfeeding an infant is the optimal nutrition source. However, the students often lacked the knowledge to care for the breastfeeding dyad and the ability/confidence to assist them with breastfeeding challenges (Cricco-Lizza, 2006; Folker-Maglaya et al., 2020; Froehlich et al., 2013; Yang et al., 2019). The four themes identified in this review were repeated in publications from various healthcare-based organizations (WHO, 2020, USDHHS, 2011; USDHHS; 2020).

The current state of breastfeeding curricula in nursing programs is difficult to assess based on the available literature as it varies by program. However, a central characteristic of breastfeeding education for nursing students must be grounded in a standardized, evidence-based curriculum and effective educational practices that promote knowledge acquisition, retention, and application (USBC, 2010; USDHHS, 2011; Campbell et al., 2022; Yang et al., 2018). A standardized curriculum would allow nurses to educate, promote, and support breastfeeding practices with their patients regardless of the healthcare setting. This lack of adequate education is a significant gap in the nursing educational model. The instructional deficiency bears further investigation and, more importantly, intervention to provide prelicensure nursing students with the education and skillset to care for the breastfeeding parent-infant dyad no matter where they practice (USDHHS, 2011; Sriraman & Kellams, 2016, Odom et al., 2013; Folker-

Maglaya et al., 2018). In addition, every lactating parent has the right to equitable breastfeeding education and support from the HCP (Sriraman & Kellams, 2016).

Limitations

There were several limitations highlighted in this review. Many of the studies included modest sample sizes and limited geographic areas. The lack of scope and depth decreases generalizability of the findings. Some of the educational interventions tested were effective but not replicated in further research (Davis & Sherrod, 2015; Cianelli et al., 2014). There is a shortage of standardized educational modules that include essential evidence-based information. Folker-Maglaya et al. (2018, 2020) used the evidence-based curriculum from the United States Breastfeeding Committee (USBC) Core Competencies in Breastfeeding Care and Services for all Health Professionals. Another limitation mentioned in numerous studies is the absence of longitudinal data. There is currently a lack of data examining if nursing students elevated knowledge and positive attitudes translate into long-term benefits throughout their careers and even in their personal lives (Davis & Sherrod, 2015; Vandewark, 2014; Lopez-Peña et al., 2020; Campbell et al., 2022). Future studies can address the limitations observed in the studies reviewed. Expanding and improving the educational strategy would impact breastfeeding rates and public health outcomes.

Gap in the Literature

The significant gap identified in this literature review was the lack of a standardized educational model. Developing a standardized breastfeeding educational model based on best practice guidelines supported by healthcare organizations is feasible to close the gap in breastfeeding education. The lack of standardization in

breastfeeding education is displayed by some researchers utilizing educational guidance from the American Academy of Pediatrics (AAP), and others incorporated components from WHO/UNICEF and including the Ten Steps to Successful Breastfeeding (Cianelli et al., 2014; Davis & Sherrod, 2015; Dodgson & Tarrant, 2007; Froehlich et al., 2013; Yang et al., 2019). In comparison, others have based their education principles on the USBC Core Competencies in Breastfeeding Care and Services for all Health Professionals (Folker-Maglaya et al., 2018; Folker-Maglaya et al., 2020; Spatz, 2014; USBC, 2010). The USBC Core Competencies focus on the required breastfeeding knowledge, skills, and attitudes required to care for parent-infant dyad (USBC, 2010).

A parallel gap in establishing adequate breastfeeding knowledge for nursing students is the ever-present trend of disparities in breastfeeding, centered around race/ethnicity and socioeconomic level (Victora et al., 2016). The presence of socioeconomic and racial disparities is often mentioned, but there is a lack of targeted educational interventions that focus on vulnerable populations. Inadequate educational preparation, conflicting information from nurses, and the lack of breastfeeding as the normative infant feeding practice for at-risk populations perpetuate these inequities (Spencer & Grassley, 2013; Anstey et al., 2017; Beauregard et al., 2019). A standardized education for all nursing students that highlights equitable prenatal education is needed. Targeting the PNS will provide all nurses with the appropriate education to support the breastfeeding parent-infant dyad in all healthcare settings which can optimize health outcomes and improve public health.

Implications for Practice

The primary concept emphasized by the WHO (2020) and the USDHHS (2011) to increase evidence-based education for all healthcare providers, especially nurses, can be seen reiterated in the literature. Providing standardized and evidence-based breastfeeding education to nursing students can enhance their knowledge and strengthen their attitude to educate, promote, and support the breastfeeding parent-infant dyad in all healthcare systems (Campbell et al., 2022; Odom et al., 2013). The significance of breastfeeding advocacy will continue to improve initiation, duration, and exclusivity, which subsequently elevates lactating parents' and infants' health worldwide (AAP, 2012; WHO, 2020; Health Resources and Service Administration [HRSA], 2020; CDC, 2018).

The prevalence of continued health disparities due to inequalities in care demands a change in the educational standards. Evidence-based education exposes the barriers the breastfeeding dyad faces. Some HCP provide suboptimal breastfeeding education and support prenatally, at the bedside, and in the postpartum period, especially for parents of certain racial and ethnic minorities and lower socioeconomic levels (Beauregard et al., 2019; Spencer & Grassley, 2013). These inequities are well documented in the literature and provide the rationale for a comprehensive standardized education for PNS. Nurses are the largest group of HCP and make the most significant impact on patient care (Sriraman & Kellams, 2016; Victora et al., 2016). Nurses and other HCP must educate and support all breastfeeding dyads equitably regardless of race/ethnicity and socioeconomic level. The breastfeeding goals set forth

by healthcare organizations can be improved by supporting **all** lactating parents (Walsh, 2012; Campbell et al., 2022; WHO, 2020; USDHHS, 2011; USDHHS, 2020).

In addition, a vital rationale for standardized and comprehensive breastfeeding education in the nursing programs is adequate preparation of PNS. The National Council Licensure Examination (NCLEX) contains questions related to the care of the childbearing family including infant feeding. Knowledgeable PNS who become nurses will translate their education into practice and benefit the breastfeeding parent-infant dyads in any healthcare setting.

Conclusion

The literature review demonstrated the inadequate and inconsistent state of breastfeeding education in prelicensure nursing programs in the United States. Nurses make up a substantial portion of the healthcare providers caring for the breastfeeding dyad; hence targeted breastfeeding education for nursing students is vital. The literature demonstrates effective educational methods but lacks standardized curricula that can be implemented in nursing programs around the country (Campbell et al., 2022). Adding creative and innovative features such as audiovisual and tactile elements can increase critical thinking and metacognition, making the educational module more meaningful (Andina-Díaz, 2020). The literature's significant gap lies in the lack of consistency and the scope and depth of the nursing student populations studied. Most researchers utilize a single university setting and one geographic area. Simultaneously, the results are promising and can assist in guiding future research, the limited scope of location and population decrease generalizability. Therefore, creating a standardized breastfeeding curriculum must be developed and assessed in multiple collegiate settings in various

locations. The data collected from such a study can address the gap in research on nursing students' breastfeeding knowledge and attitudes. A standardized curriculum is the first step to address the more significant racial disparities in breastfeeding initiation, duration, and exclusivity. In addition, the racial disparities seen in breastfeeding rates can also be affected by a standardized curriculum that addresses vulnerable populations, including the barriers many breastfeeding dyads face in their breastfeeding journey.

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Figure 2.1
PRISMA Flow Diagram

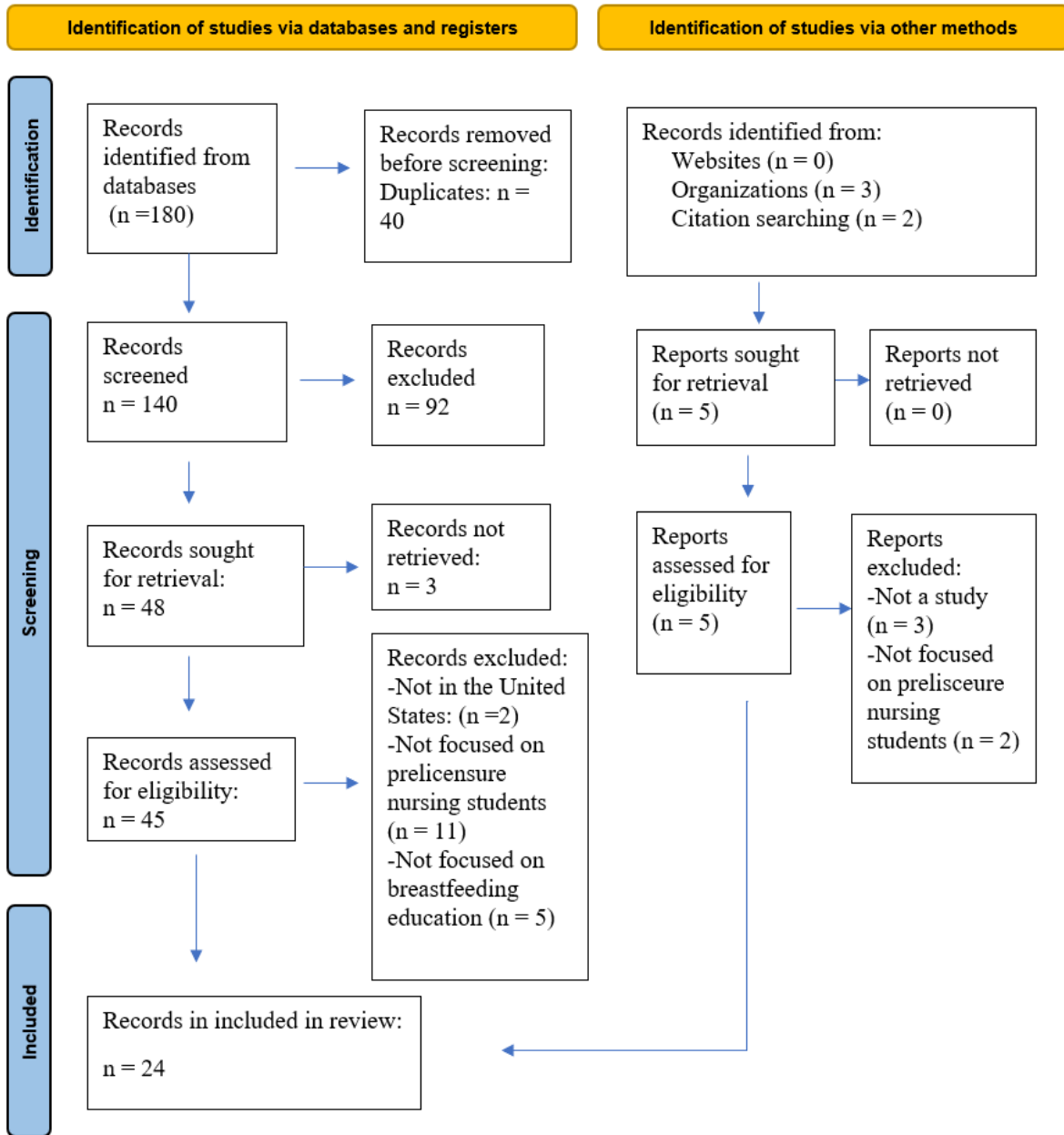


Table 2.1 – Literature Review Evidence Table

Author Year	Research Question / Hypothesis	Design / Sample	Measures / Tools	Statistical Test	Outcomes	Strengths (S) / Limitations (L)
Ahmed et al. (2011)	To assess BF knowledge of senior NS.	Explorative descriptive Convenience sample n = 115	ABKAQ - Brodribb (2008)	t-test Pearson corr.	Positive relationship between knowledge of lactation physiology and BF management. Examined K & S needed for generalist nurse to use in any setting.	S = first to explore the type of relationship K & S L = small sample size, one geographic area
Bozzette & Posner (2013)	Examine if BF education will change NS knowledge of BF in BS programs.	One group comparison Pretest / posttest 24 students	Pretest / posttest Marzalik (2004)	t-test	SS improvement in NS knowledge in 6 course objectives after BF education pilot program. Mean 13.08 (SD 2.26) increased to a mean of 16.79 (SD 1.64).	S = potential to change curriculum to meet educational needs L = pilot study, one sample, tool used has T/F options only
Campbell et al. (2022)	Examine the literature for BF educational methods, resources, and curriculum.	Scoping review n = 29 1982 - 2018	PRISMA for Scoping Reviews	n/a	Lack of standardization of BF educational & innovative methods including cultural diversity and SDOH. Increased BF education increases K, S, attitudes.	S = extended date range, multidisciplinary, multilingual, international L = none
Cianelli et al. (2014)	Developing and testing an online breastfeeding training (BT) among undergraduate NS.	Pretest / posttest n=86	Module based on UNICEF / WHO / BFHI 20 hours BF curriculum	Paired t-test	NS increased their levels of knowledge & confidence related to BF to care for mothers & infants	S = education module based on evidence-based guidelines, online format L = sample size and one school
Cricco-Lizza (2006)	Explore breast-feeding attitudes and beliefs of NS in an urban university BSN program.	Qualitative n = 12	Semi structured interviews	Thematic analysis	Barriers identified: 1) societal views about the breast, 2) dependence / independence conflicts, 3) intimacy concerns. Felt comfortable educating but not promoting BF.	S = viewpoints received, open sharing L = small sample, older publication
Davis & Sherrod (2015)	Will an evidence-based educational intervention will improve baccalaureate NS BF	randomized pretest / posttest n=113	ABKAQ - Brodribb (2008)	Paired t-test	BF lecture and standardized patient (SP). Increased knowledge (pretest mean 3.33 to posttest mean 4.13) and attitude (pretest	S = use of SP L = Small sample, limited results, no control for extraneous variables,

Author Year	Research Question / Hypothesis	Design / Sample	Measures / Tools	Statistical Test	Outcomes	Strengths (S) / Limitations (L)
	knowledge and attitude?				mean 3.58 to posttest mean 3.86).	inconsistency with role play time
Dodgson & Tarrant (2007)	Determine the effectiveness of an infant feeding education intervention on NS knowledge and attitude levels.	cross-sectional, quasi-exper.	19-item knowledge survey Theory of Planned Behavior	t -test Chi Square Fisher exact test	SS to associate BF with positive outcomes. control group (M = 6.84; SD = 2.95) vs intervention group (M = 10.30; SD = 2.51) Attitudes toward BF and formula-feeding were not SS.	S = enc curriculum interventions, "NS will be in a position to promote best practices and give health-related advice" L = no randomization, non-equil groups
Folker-Maglaya et al. (2018)	Investigate the effectiveness of a BF toolkit education in an ADN program.	Pilot study Pretest / posttest n=114	Marzalik (2004) BF knowledge tool	F test t-test Linear regression	Intervention group (mean of 2.97, SD 2.23) demonstrated a SS higher score (mean of 2.02, SD 1.91) than the control group.	S = toolkit based on evidence-based care, validated tool L = 1 sample, 1 ADN program, limited control of moderating variables
Folker-Maglaya et al. (2020)	Determine the effectiveness of the BF curriculum (toolkit).	Pretest / Posttest n = 102	Marzalik (2004) BF knowledge tool	F test t-test Linear regression	Increase in posttest scores for both groups. Inter. group scored signif. higher on posttest. inter mean = 12.34, control mean = 10.73, t value = 4.12, p < .0001	S = replicated study on toolkit L = 1 sample from 1 ADN program
Froehlich et al. (2013)	Determine if a brief educational intervention would affect BF K&S.	Pretest / posttest n = 308	Attitude of BF, public acceptance	chi-square ANOVA t -tests	Theory of Planned Behavior. SS change in K & S toward BF noted between pre- and posttest scores on 5 of 8 questions	S = use of the TPB, brief education can increase knowledge L = short fact sheet, homogenous sample
Linares et al. (2018)	To ascertain the BF attitudes of NS, identify misconceptions, and examine attitudes pre and post BF education.	Undergrad, DNP, PhD NS n=793	50 question survey	One-way ANOVA	SS increase in attitudes for those NS who had the BF education	S = surveyed cross section of nursing students L = low response rate of 17%, did not use existing tools

Author Year	Research Question / Hypothesis	Design / Sample	Measures / Tools	Statistical Test	Outcomes	Strengths (S) / Limitations (L)
Lopez-Peña et al. (2020)	To formulate and test a BF knowledge questionnaire for NS.	Cross-section study n = 144	"Apprendel act" 21 question survey (after pilot data modifications)	Kuder-Richardson -20 MW/KW	SS results demonstrated increased level of knowledge from 1 st year to 4 th year NS. Reliability and validity of survey tool was established.	S = survey designed and validated for NS L = one geographic area, further test survey tool
Rhodes, & Burgess (2018)	Evaluation of a BF workshop's impact on NS knowledge, skills, and attitudes toward BF.	Pretest / posttest qualitative survey n= 69	2.5-hour workshop	n/a	Based on evaluation the workshop strengthened positive attitudes and beliefs surrounding BF.	S = detailed description of workshop design L = limited results and data analysis provided
Spear (2006)	Asses the BF knowledge of junior and senior baccalaureate NS.	Survey n = 80	Smith's (2004) breastfeeding knowledge tool	Spearman Rho	Findings reveal the need to strengthen both the didactic and clinical components of the obstetric course curriculum.	S = supported findings in other studies L = convenience sample, one program, no psychometric analysis done on tool
Vandewark (2014)	The research objective was to further the body of knowledge concerning the relationship between BF knowledge and attitudes, particularly in novice NS.	mixed methods n=89 two cohorts = 1 st & last semester NS	Iowa Infant Feeding Attitude Scale (IIFAS) Brodribb (2008) (ABKAQ)	ANOVA Pearson correlation	Attitude scores for both groups were similar (not SS). Knowledge scores for the groups differed significantly ($p=.006$). Positive correlation between knowledge and attitudes were SS $r(89) = .482, p < .000$.	S = results consistent with the literature, encourage increased education even after graduation. Partially replicated studies by Riley (2007) and Ahmed & El Guindy (2011) L = low response rate, self-selection bias, individual location
Webber et al. (2021)	Impact of a lactation simulation experience on the BF self-efficacy of undergraduate NS. Qualitative differences of low-fidelity	Qualitative 1 - after simulation experience 2 - end of clinical n = 76	low- and high fidelity simulation Rhodes and Burgess (2018)	Thematic analysis	1. <i>Breastfeeding Techniques</i> improved hands-on skills 2. increased <i>Student Confidence</i> in care & education of patients 3. <i>Breastfeeding Advocacy</i> 4. <i>Simulation Experience</i> positive	S = quality lactation education plus simulation is beneficial L = anecdotal qualitative, 1 sample, small sample

Author Year	Research Question / Hypothesis	Design / Sample	Measures / Tools	Statistical Test	Outcomes	Strengths (S) / Limitations (L)
	or high-fidelity BF sim.					
Yang, Salamonson, Burns, & Schmied (2018)	Examination of studies focused on BF knowledge, attitudes, and confidence of NS.	systematic review n=14 2000 - 2017	PRISMA	n/a	Need evidence-based curriculum, culturally appropriate to determine how BF knowledge and skills are best facilitated. How can NS relate theoretical BF knowledge to practice?	S = 7 countries, multiple types of healthcare provider students L = year 2000 and above
Yang, Schmied, Burns, & Salamonson (2019)	Examine the BF theoretical and clinical learning experiences effect on knowledge and attitude in Taiwanese NS.	cohort study pretest / posttest n=215	ABKAQ Short-Form	Regression	Education demonstrated a SS increase in NS knowledge and improved positive attitudes towards BF.	S = data collected at 2 points in time vs. 1 with other studies L = Homogenous sample in one university, possible maturation effect
Yang, Burns, Salamonson & Schmied (2019)	Explore the expectations and experiences of Taiwanese NS supporting BF in the clinical.	qualitative descriptive	Focus groups n = 8 students n = 6 faculty n = 4 RNs n = 12 moms	Thematic analysis COREQ	Themes: 1) High expectations 2) The reality is different 3) Improving confidence in students Classroom instruction does not fully prepare NS to support mothers with BF.	S = perspectives of mothers, nursing staff and teachers about NS supporting BF. L = individual location

Key:

- BF: breastfeeding**
- SS: statistically significant**
- NS: nursing students**
- GDM: gestation diabetes mellites**
- K & S: knowledge and skills**

Chapter III: Methods

The purpose of this chapter is to present the quasi-experimental study designed to examine the breastfeeding attitudes of prelicensure nursing students (PNS). The impetus for choosing the population of PNS and the importance of education on breastfeeding will be explained. The evidence-based breastfeeding module used as the intervention will be described. The module included breastfeeding knowledge, skills, and attitudes for all healthcare workers. Finally, the general and statistically significant findings will be discussed, and future implications outlined. The manuscript has been formatted to the specifications for Nurse Educator and will be submitted for publication in 2023.

Abstract

Background: Optimal breast milk feeding provides unmatched health benefits for lactating parents and their infants since breast milk contains the species-specific blend of nutritional and immunobiological components to facilitate growth for an infant.

Purpose: The aim of this study was to create a breastfeeding educational module based on evidence-based guidelines and evaluate the effect on the breastfeeding attitudes of prelicensure nursing students (PNS).

Methods: The study implemented a quasi-experimental design with a pretest-posttest to measure the breastfeeding attitudes of PNS in two university settings.

Results: A statistically significant increase was demonstrated between pretest breastfeeding attitude of PNS to posttest breastfeeding attitude ($t = 11.761$, $df = 72$, $p < .001$) in a total sample of 73 students from two educational settings.

Conclusion: Nurses are uniquely positioned to promote, educate, and support breastfeeding. The breastfeeding module enhanced the attitudes of the PNS in the study sample. The study's findings can be used to develop standardized interventions to include in curricula of PNS to optimize the education and support for the childbearing / breastfeeding dyad.

Keywords: *nursing education, breast feeding, breastfeeding, evidence-based, curriculum, competencies*

Background

The provision of breastmilk impacts the health of lactating parents and infants alike. The World Health Organization (WHO) estimates that increasing breastfeeding rates to the optimal feeding recommendations could prevent an estimated 820,000 deaths in children less than five years every year (WHO, 2020). Lactating parents who provide breastmilk to their infants also experience short- and long-term health benefits (WHO, 2020). Cancer and heart disease are the leading causes of death for adults in the United States, and breastfeeding has been associated with a lower risk of breast and ovarian cancer (American Academy of Pediatrics [AAP], 2012). Victora et al. (2016) estimates that breastfeeding can save 20,000 annual deaths in women from breast cancer. Heart disease is the other leading cause of death, and the process of lactation is a known factor to mitigate the effects of cardiovascular disease (AAP, 2012). Tschiderer et al. (2022) demonstrated a relative risk reduction for all cardiovascular disease (CVD) outcomes in women who “ever” breastfed as reported in their recent systematic review and meta-analysis. In addition, the American Academy of Pediatrics (2012) states that if the rate of exclusive breastfeeding for six months rose to 90%, the United States could see an economic savings of \$13 billion in health care costs per year. Multiple healthcare agencies and organizations mandate increased breastfeeding promotion and education to impact the overall health of all people (AAP, 2012; WHO, 2020).

Lactating parents who choose to breastfeed face numerous barriers. However, lactating parents can achieve breastfeeding goals through breastfeeding promotion, education, and support from nurses and other frontline healthcare providers. In the first

hours of life, breastfeeding initiation is positively associated with knowledgeable healthcare workers and the mother's self-efficacy (Campbell et al., 2022; Lau et al., 2018; Yang et al., 2018). Unfortunately, there are few publications in the literature about how to educate nursing students about the health impacts of breastfeeding, and there are even fewer resources to provide practical interventions to nursing students to increase knowledge and positive attitudes based on standardized, evidence-based practice guidelines (Campbell et al., 2022; Yang et al., 2018).

Theoretical Underpinning

This research study was constructed based on the Theory of Planned Behavior (TPB) framework, which has been utilized in various disciplines, including nursing, to explain and predict behaviors and guide practice changes (Russell-Babin, 2017). In addition, the TPB has been foundational for research focused on health decision-making behaviors and pivotal in the design of health-promoting interventions (Polit & Beck, 2017). The TPB was based on the premise that a person's behavior is primarily guided by the **intent** to participate in that behavior. The degree of intent is dependent on three factors: 1) *attitude* toward the behavior, 2) *subjective norm* or whether there is social pressure to perform or not perform the behavior, and 3) *perceived behavioral control* indicating self-efficacy with the behavior (Ajzen, 2020).

The three tenets of the TPB can be correlated to breastfeeding education and is displayed in Figure 1. The first tenet of *attitude* demonstrates that a more positive attitude toward breastfeeding increases a nursing student's intent to promote breastfeeding as best practice. The second tenet of the *subjective norm* can characterize that a more favorable societal expectation increases intent to promote

breastfeeding. Lastly, the third tenet of *perceived behavioral control* can correlate to a nursing student's increased knowledge and skills to provide education and support to the breastfeeding dyad, thereby increasing their intent.

Purpose

The purpose of the study as underpinned by the Theory of Planned Behavior was to develop functional educational module to promote knowledge acquisition and positive attitudes to foster optimal breastfeeding support. The study examined the module's impact on breastfeeding attitudes of prelicensure nursing students (PNS). This evidence-based breastfeeding module (EBBM) was constructed from the United States Breastfeeding Committee (2010) Core Competencies in Breastfeeding Care and Services for All Health Professionals and are displayed in Table 3.1. The study aims were to 1) create an EBBM based on the United States Breastfeeding Committee (USBC) Core Competencies in Breastfeeding Care and Services for all Health Professionals and 2) evaluate the effectiveness of the EBBM with PNS. The research questions were:

1. Is there a difference in the undergraduate prelicensure nursing students breastfeeding attitude before (pretest score) and after (posttest score) participating in the evidence-based breastfeeding module (EBBM)?
2. What is the relationship between the prelicensure nursing student's breastfeeding awareness level and pretest breastfeeding attitude score?
3. Is there a relationship between age, gender identity, race/ethnicity, and country of birth and the pretest breastfeeding attitude score among prelicensure nursing students?

4. What is the relationship between the pretest breastfeeding attitude scores and posttest breastfeeding attitude scores of the two groups (Group 1 - Illinois cohort, group 2 - Wisconsin cohort)?

Methods

Design

This quasi-experimental study used a pretest-posttest design to examine the effect of the EBBM intervention on undergraduate PNS breastfeeding attitudes. Prior to the recruitment of study participants, Institutional Review Board (IRB) approval was obtained for each university setting. The additional layer of protection for the participating nursing students was to have students choose a secure identity using a unique identifier code (UC) for the pretest and the posttest surveys. No other identifying data was collected. The online Qualtrics platform assisted the research team to maintain confidentiality, protect students' identities, and prevent the perception of coercion to participate in the study. Ethical research principles were followed to assure ethical treatment of data.

Setting

The study was conducted in two university settings that offered undergraduate PNS programs. One university was in an urban city in southeastern Wisconsin, and the other was in a suburban/rural city in Northern Illinois.

Sample

A power analysis using the G Power program was completed *a priori* to determine the sample size needed. The sample size parameters established that 71 students were required to achieve the power of .80. A convenience sample of 155

undergraduate PNS who met the eligibility requirements from the two university settings was recruited to participate in the study. The inclusion criteria were as follows: 1) adults 18 years or older; 2) a currently enrolled student in the prelicensure nursing program; 3) registered in a nursing course with maternal-infant content; 4) able to read or write the English language; 5) and agreed to participate in the study. The exclusion criteria were as follows: 1) an inability to complete the pretest and posttest surveys, 2) unable to read and write English, and 3) did not wish to participate. Participation was voluntary, no benefits were extended to those who participated, and no negative repercussions were provided with those who did not participate.

Measurement Instruments

Demographic information, self-reported by the PNS, on the pretest survey included age, gender identity, race/ethnicity, and country of birth (Table 3.2). The Breastfeeding Awareness measurement, also collected with the pretest survey, was self-reported in one of five categories by the PNS (Table 3.2). The five classifications categorized the level of breastfeeding awareness and experience each student had encountered based on their personal experience, family experience, and professional exposure. The Breastfeeding Awareness level was author developed data collection tool designed to quantify the PNS awareness of and experiences with the breastfeeding process. The data collection tool's creation was inspired by the lack of appropriate measures available in the literature. Further testing of the validity and reliability of the tool is recommended.

The Breastfeeding Attitude Score was measured using the Iowa Infant Feeding Attitude Scale (IIFAS) and collected on the pretest and posttest surveys. de la Mora et

al. (1999) developed the IIFAS to measure the attitude (positive/negative) toward breastfeeding as an infant feeding method. The IIFAS included 17 items completed using a 5-point Likert scale. A higher score equates to increased knowledge and a more positive attitude towards breastfeeding (Casal et al., 2017). In addition, the IIFAS reported consistent construct validity and reliability with an average Cronbach's alpha of .86 (et al., 2017).

For the reliability of this study and to determine the internal consistency of the IIFAS tool, a Cronbach's alpha was run and was found to be .70. Validity was measured using face validity and content validity based on previous research with the IIFAS and evaluation by the research team. Test-retest reliability was expected because the pre- and post-test surveys included the same IIFAS questions.

Procedure

The pre and post survey was provided for students to describe any change in attitudes after the EBBM and presented during the spring semester of 2022 (February 2022 - April 2022). Students self-selected to participate by completing the surveys using a unique identified code (UC) to maintain anonymity.

The EBBM was constructed based on two evidence-based sources. The first source was the USBC (2010) Core Competencies in Breastfeeding Care and Services for All Health Professionals (Table 3.1). Applying the USBC (2010) Core Competencies to the EBBM provided a framework to educate the nursing students with the needed knowledge, skills, and attitudes to care for the breastfeeding dyad. The USBC (2010) Core Competencies focus on the lactation process, supporting the breastfeeding dyad in the healthcare setting, and awareness of substantial barriers that impede optimal

breastfeeding practices. The second source used to structure the EBBM was the Maternity and Women's Health Care (12th ed) text by Lowdermilk et al. (2020). The content in Chapter 25 focused on infant feeding and was combined with the Core Competencies to create the EBBM PowerPoint module.

The EBBM was delivered via a 45-minute live PowerPoint Presentation session. The pretest was deployed one week prior to the EBBM. The posttest was made available to students immediately after the EBBM was presented and had to be completed within one week. The time for students to complete the pretest and posttest survey was estimated to be between five and ten minutes. Due to the anonymous nature of the study participation, the pretest and posttest survey links were provided to all eligible undergraduate PNS at both universities.

Data Collection

The recruitment of eligible undergraduate PNS based on inclusion and exclusion criteria was undertaken by fully disclosing the study purpose and procedure for the research study. A written copy of the recruitment script and consent was provided electronically to each eligible student. The pretest survey was administered using the online Qualtrics platform. The pretest survey included: 1) the unique identifier code (UC) created by each student to maintain anonymity; 2) five demographic questions (Table 3.2), and 3) the seventeen questions contained in the IIFAS. Those eligible undergraduate prelicensure students who participated took the pretest using the supplied Qualtrics link. Informed consent of each student participant was obtained upon initiation of the pretest survey. The students began the pretest survey (Table 3.4) by creating their UC.

The Qualtrics link was supplied to all eligible undergraduate PNS in the maternal-infant course who were informed of the study prior to the pretest distribution. The link was sent to all prelicensure undergraduate students due to the anonymity of those who chose to participate. The posttest survey included only the UC and the IIFAS questions (Table 3.4). The UC maintained confidentiality.

Data Analysis

The data was compiled from the pre- and posttest surveys using the Qualtrics platform and exported for analysis to a Microsoft Excel document. The data collected only displayed the unique identifier code (UC); therefore, it was considered de-identified. All files were kept in a secured One Drive account of the PI, and no sharing of raw data occurred. Only the aggregated data sets were shared with the research team via encrypted email communication. Data analysis was conducted in collaboration with the research team. The demographic variables with sample characteristics were analyzed using descriptive statistics, frequencies, means, and standard deviations. Upon final posttest survey results, the variables (Table 3.3) and completed data collection were reviewed and analyzed (Tables 3.5 and 3.6).

Statistical analysis was achieved using SPSS version 28. The level of significance was set at 0.05. The data were examined for missing data and outliers. The data was cleaned, and any cases with missing data were not included in the data analysis. The assumptions for normality were met and parametric statistical analysis were conducted.

Results

There were 155 PNS screened for inclusion in this study. Descriptive statistics were calculated for the 73 PNS from the two university locations that completed the pre- and posttest surveys and were included in the data analysis. The characteristics of the sample and Breastfeeding Awareness are displayed in Table 3.6. Two students failed to complete the country of birth question.

Research Question 1:

A paired t-test was used to detect a difference in the undergraduate PNS breastfeeding attitude before and after participating in the EBBM for each cohort of students pre- and post-intervention. The data was presented to display the mean difference between pre- and post-test data collection across all student populations. The populations were observed for normal distribution and homogeneity of variance. The effect size, or the degree of the relationship between the breastfeeding attitude score before and after the EBBM, was calculated and reported using Cohen's d , which was 1.68. The null hypothesis was therefore rejected.

Research Question 2:

A Pearson correlational analysis determined any connection between the pretest breastfeeding attitude score and the breastfeeding awareness level. A small statistically significant positive correlation was seen (Pearson $r = .263$, $p = .05$). A larger sample in the current study may have demonstrated a more enhanced relationship. The researcher's hypothesis anticipated that an elevated breastfeeding awareness level would have a stronger relationship with the pretest breastfeeding attitude score.

Research Question 3:

Multiple regression analysis examined the relationship between the pretest breastfeeding attitudes among undergraduate PNS and their reported age, gender, race/ethnicity, and country of birth. The data analysis determined no statistical relationship between the demographic data collected and the pretest breastfeeding attitude scores. The study's sample size may be a significant factor in the lack of relationship between the variables and the breastfeeding attitude scores ($n = 73$). For example, a considerably small portion of the participants self-reported being born outside of the United States ($n = 5$); therefore, the country of birth variable was potentially negligible. The other variables of age, gender identity, and race/ethnicity, while valuable, were closely related to the general demographics of prelicensure nursing students in the United States. Nearly 80-90% of the participants self-reported being younger, female, and non-Hispanic/White (Rauner & Schneider, 2017; Smiley et al., 2021).

Research Question 4:

Independent samples t-test was utilized to compare the nursing student cohorts in the intervention groups from Illinois and Wisconsin before and after the EBBM. The data analysis determined a lack of statistical significance between the two cohorts. This can be attributed to the demographics of the PNS in both universities mirroring the current demographics of all prelicensure nursing students in the United States (Rauner & Schneider, 2017; Smiley et al., 2021). Another factor potentially affecting the lack of diversity was that those PNS who chose to participate were from similar backgrounds and interested in breastfeeding.

The findings from this study support the primary research question demonstrating that an EBBM based on the USBC (2010) Core Competencies can be provided to increase PNS attitudes regarding breastfeeding. The pretest sample mean was 62.23 (SD 4.9), and the posttest sample mean was 71.30 (SD 5.814). The paired *t*-test demonstrated a statistically significant difference in means of $t = 11.761$ ($df = 72$, $p < .001$). In the pretest survey, 94.5% ($n = 69$) of students had an attitude score in the Neutral attitude towards breastfeeding category. In contrast, in the posttest survey results, only 37% ($n = 27$) remained Neutral, with the remaining students ($n = 46$) elevated to the Positive or Very Positive toward Breastfeeding category. Overall, 58.9% ($n = 43$) of students rose into the next highest category of positive attitudes after the posttest. The mode rise in score was 12 points (SD 6.58) from pretest to posttest.

The findings revealed that a categorized breastfeeding awareness level did significantly associate with the pretest breastfeeding attitude score (Table 3.5). However, the positive correlation was small ($r = .263$). While the data was able to support the second research question, further investigation needs to be completed. Replication of the current study with larger sample size and further assessing the validity and reliability of the breastfeeding awareness categories is suggested. The third research question was unfounded due to the lack of a significant correlation between age, gender, or race/ethnicity with pretest breastfeeding attitude score. The Illinois cohort of PNS and Wisconsin cohort both demonstrated a significant ($p = < .001$) rise in breastfeeding attitude ($t = -9.506$, $df = 41$ and $t = -7.473$, $df = 30$ respectively). However, there were no significant differences between the two cohorts in sample characteristics.

Discussion

The study demonstrated that the EBBM influenced a change in the positive breastfeeding attitudes among the PNS who participated in the study. The EBBM was delivered by an experienced maternity nurse educator knowledgeable about breastfeeding. In addition, the breastfeeding lecture content was based on the infant feeding chapter in Lowdermilk et al. (2020) and the USBC (2010) Core Competencies. This practical, evidence-based educational intervention can be easily adapted into the curriculum of any prelicensure nursing program. Nurses are uniquely positioned to promote, educate, and support feeding practices for the breastfeeding dyad. These findings can assist in establishing a standardized core curriculum to educate prelicensure nursing students (PNS) in programs across the United States about the health impacts of breastfeeding for both the lactating parent and infant.

Limitations

One limitation was the modest sample size, although an impressive percentage of the eligible PNS participated in the study, and the sample size for power analysis was reached. Expanding the sample to an increased number of PNS may expand the diversity of those PNS who choose to participate and can strengthen the EBBM intervention results. In addition, there was an 8% attrition rate in the current study. Eighty-six PNS completed the pretest survey, but only seventy-three completed the post-test survey. The link was available immediately after the EBBM and remained open for one week. However, after the initial twenty-four hours, the response rate dropped dramatically. Efforts to manage attrition could be achieved potentially with small

monetary incentives for those PNS who complete both the pretest and posttest in the established time parameters.

A second limitation is regarding the breastfeeding awareness level measure. The researcher created the measurement instrument to aid in data collection based on a lack of tools in the literature that qualified breastfeeding experiences. Expanded use of the measurement tool should be conducted to establish a baseline reliability and validity for its use.

A final potential limitation is that the EBBM was provided by a faculty member with an Internally Board-Certified Lactation Consultant (IBCLC) qualification. Replicating the study may be more difficult with a faculty member who has a cursory knowledge of infant feeding content and care of the breastfeeding dyad. While enthusiasm for supporting and caring for the breastfeeding dyad is not a drawback, it can complicate the reproducibility of the study design.

Implications

The breastfeeding process for the lactating parents and the consumption of breast milk for infants can contribute to improve overall health outcomes worldwide. For example, chronic conditions such as cancer and heart disease can be mitigated by increasing breastfeeding rates. In addition, infants and young children benefit from breast milk consumption for short-term conditions such as respiratory and gastrointestinal issues to more severe conditions such as obesity, diabetes, and Sudden Infant Death Syndrome (SIDS).

Increasing education for PNS can optimize the care they provide to lactating parents and infants. A PNS who demonstrates a positive attitude may have a greater

intent to pass along their knowledge and foster the breastfeeding relationship (Vandewark, 2014). Another aspect of the USBC (2010) Core Competencies is the greater focus to eliminate health disparities. The EBBM highlights the need to provide equitable care and education to all parents of childbearing age. Researchers have demonstrated how the social determinants of health and inequitable care negatively impact breastfeeding rates (Reeves & Woods-Giscombé, 2015; Safon et al., 2021; Spencer & Grassley, 2013; Walsh, 2012). This focus including racial/ethnic and cultural awareness allowed students to see the existing support structures and how social determinants of health impact breastfeeding practices for vulnerable populations of racial/ethnic groups and low socioeconomic status (Anstey et al., 2017; Bartick et al., 2017).

This study's finding adds to the literature by developing and testing just one EBBM that can be utilized widely in nursing education. Additional research is needed to evaluate this EBBM and other similar modules to increase awareness of breastfeeding's importance. In addition, research focused on following a PNS for a longer term to determine the length of time that the EBBM impacts the care of the breastfeeding dyad five or ten years into their career would be meaningful.

Conclusion

Nurses will care for the breastfeeding dyad in many inpatient, outpatient, and community settings throughout their careers. Therefore, a concerted effort to improve breastfeeding education for entry-level for nurses is required. This study using an evidence-based curriculum based on the USBC (2010) Core Competencies will promote additional research while implementing the current study design. The findings from this

study may stimulate future research to establish an effective curriculum to increase nursing students' breastfeeding knowledge and attitude, thereby promoting, educating, and supporting the breastfeeding parent-infant dyad. The USBC (2010) Core Competencies include equitable care to promote awareness of racial disparities and current societal acceptance of breastfeeding. Overall support and the normalization of breastfeeding can begin to close the gaps in breastfeeding rates seen in the United States. Increasing optimal breastfeeding practices is one way nurses can positively impact the overall health outcomes of the parent and child throughout the lifespan.

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Figure 3.1 – Theoretical Framework

**Nursing Students Breastfeeding Attitude
Based on the Theory of Planned Behavior (Ajzen, 2020)**

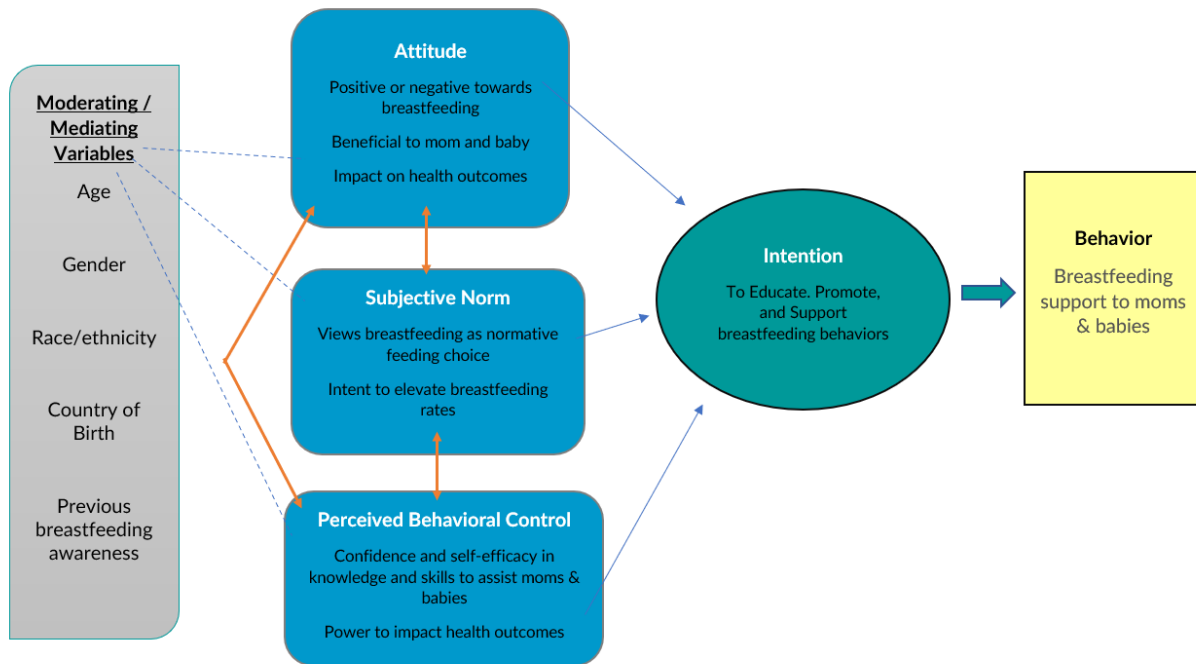


Figure 3.2

Core Competencies in Breastfeeding Care and Services for All Health Professionals

Knowledge All health professionals should understand the:

- 1.1 basic anatomy and physiology of the breast
- 1.2 role of breastfeeding and human milk in maintaining health and preventing disease
- 1.3 importance of exclusive breastfeeding, and its correlation with optimal health outcomes
- 1.4 impact of pregnancy, birth, and other health care practices on breastfeeding outcomes
- 1.5 role of behavioral, cultural, social, and environmental factors in infant feeding decisions and practices
- 1.6 potentially adverse outcomes for infants and mothers who do not breastfeed
- 1.7 potential problems associated with the use of human milk substitutes
- 1.8 few evidence-based contraindications to breastfeeding
- 1.9 indications for referral to lactation services
- 1.10 resources available to assist mothers seeking breastfeeding and lactation information or services
- 1.11 effects of marketing of human milk substitutes on the decision to breastfeed and the duration of breastfeeding

Skills All health professionals should be able to:

- 2.1 practice in a manner that protects, promotes, and supports breastfeeding
- 2.2 gather breastfeeding history information sufficient to identify mothers and families who would benefit from specific breastfeeding support services
- 2.3 seek assistance from and refer to appropriate lactation specialists
- 2.4 safeguard privacy and confidentiality
- 2.5 effectively use [new information](#) technologies to obtain current evidence-based information about breastfeeding and human lactation

Attitudes All health professionals should:

- 3.1 value breastfeeding as an important health promotion and disease prevention strategy
- 3.2 recognize and respect philosophical, cultural, and ethical perspectives influencing the use and delivery of breastfeeding care and services
- 3.3 respect the confidential nature of the provision of breastfeeding care and services
- 3.4 recognize the importance of delivering breastfeeding care and services that are free of commercial conflict of interest or personal bias
- 3.5 understand the importance of tailoring information and services to the family's culture, knowledge, and language level
- 3.6 seek coordination and collaboration with interdisciplinary teams of health professionals
- 3.7 recognize the limitations of their own lactation knowledge and breastfeeding expertise
- 3.8 recognize when personal values and biases may affect or interfere with breastfeeding care and services provided to families
- 3.9 encourage workplace support for breastfeeding
- 3.10 support breastfeeding colleagues
- 3.11 support family-centered policies at federal, state, and local levels

United States Breastfeeding Committee. Core Competencies in Breastfeeding Care and Services for All Health Professionals. Rev ed. Washington, DC: United States Breastfeeding Committee; 2010.

Table 3.1**Demographic Questions on Pretest Survey**

Variable	Scale	Categories
Age	years	20-25 years old 26-30 years old 31- 40 years old 41-50 years old
Race/ethnicity	NIH categories	American Indian or Alaska Native Asian Black or African American Hispanic or Latino Native Hawaiian or Other Pacific Islander White Multiracial
Gender Identity		Male Female Non-binary/third gender Prefer not to say
Country of birth		Open text box
Breastfeeding awareness	No Awareness to Extrememly Aware	<ol style="list-style-type: none"> 1. No awareness = no experience, only aware that breastfeeding is a feeding option 2. Slight awareness = strangers in public or distant family/friends 3. Moderate awareness = limited personal (days to weeks) or family/friends experience, know someone who has breastfed, limited contact and discussion regarding breastfeeding 4. Very aware = personal experience (days to months), multiple family/friends, healthcare provider shared their knowledge 5. Extremely aware = personal experience (months to years), multiple family or friends, attended support groups, discussed breastfeeding with others

Table 3.2 – Study Variables

Variable Name	Variable Type	Level of Measurement
Age	Independent variable	Categorical
Gender	Independent variable	Categorical
Race/Ethnicity	Independent variable	Categorical
Country of Birth	Independent variable	Nominal or categorical
Breastfeeding Awareness Level	Independent variable	Categorical
Breastfeeding Attitude Score (score based on IIFAS)	Dependent variable	Continuous
Evidence-based Breastfeeding Module (EBBM)	Independent variable (Intervention)	

Table 3.3 – Components of Pretest and Posttest Surveys

Pretest Survey		Posttest Survey	
1	Unique Identifier Code (UC)	1	Unique Identifier Code (UC)
2	Demographic questions <ul style="list-style-type: none"> • Age • Gender identity • Race/ethnicity • Country of birth 	2	Iowa Infant Feeding Attitude Scale (IIFAS) <ul style="list-style-type: none"> • 17 questions
3	Breastfeeding Awareness level		
4	Iowa Infant Feeding Attitude Scale (IIFAS) <ul style="list-style-type: none"> • 17 questions 		

Table 3.4 – SPSS Output

Paired Samples Statistics				
	Mean	N	Std. Deviation	Std. Error Mean
Pretest score	62.23	73	4.900	.574
Posttest score	71.30	73	5.814	.680

Paired Samples Test									
	Paired Differences					t	df	Significance	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
				Lower	Upper				
Pretest score - Posttest score	-9.068	6.588	.771	-10.606	-7.531	-11.761	72	<.001	<.001

Significant at the 0.05 level

Paired Samples Test									
	Paired Differences					t	df	Significance	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
				Lower	Upper				
pretest score IL - posttest score IL	-10.429	7.109	1.097	-12.644	-8.213	-9.506	41	<.001	<.001
Pretest score WI - Posttest score WI	-7.226	5.383	.967	-9.200	-5.251	-7.473	30	<.001	<.001

Significant at the 0.05 level

Correlations			
		BF awareness level	Pretest score
BF awareness level	Pearson Correlation	1	.263*
	Sig. (2-tailed)		.025
	N	73	73
Pretest score	Pearson Correlation	.263*	1
	Sig. (2-tailed)	.025	
	N	73	73

*. Correlation is significant at the 0.05 level (2-tailed).

Table 3.5 – Distribution of Demographic Data (n = 73)

Age			
	Frequency	Percent	Cumulative Percent
20-25	61	83.6	83.6
26-30	7	9.6	93.2
31-40	5	6.8	100.0
Total	73	100.0	
Gender			
	Frequency	Percent	Cumulative Percent
male	11	15.1	15.1
female	61	83.6	98.6
non-binary/third gender	1	1.4	100.0
Total	73	100.0	
Race/ethnicity			
	Frequency	Percent	Cumulative Percent
Asian	6	8.2	8.2
Black or African American	4	5.5	13.7
Hispanic or Latino	13	17.8	31.5
Native Hawaiian or other Pacific Islander	1	1.4	32.9
White	45	61.6	94.5
Multiracial	4	5.5	100.0
Total	73	100.0	
Country of birth			
	Frequency	Percent	Cumulative Percent
Cameroon	1	1.4	1.4
Gabon	1	1.4	2.7
none	2	2.7	5.5
Puerto Rico	1	1.4	6.8
USA	68	93.2	100.0
Total	73	100.0	

Table 3.5 – Distribution of Demographic Data (n = 73)

Breastfeeding Awareness Level			
	Frequency	Percent	Cumulative Percent
No awareness	12	16.4	16.4
Slight awareness	10	13.7	30.1
Moderate awareness	40	54.8	84.9
Very aware	4	5.5	90.4
Extremely aware	7	9.6	100.0
Total	73	100.0	

	N	Minimum	Maximum	Mean	Std. Deviation
BF awareness level	73	1	5	2.78	1.096

Chapter IV: Policy

The purpose of this chapter is to present a policy proposal based on the findings of the dissertation study to influence the breastfeeding education of prelicensure nursing students (PNS). The policy recommendation is aimed at the accrediting organizations of the American Association of Colleges of Nursing (AACN), the Commission on Collegiate Nursing Education (CCNE), and the Accreditation Commission for Education in Nursing (ACEN). The manuscript has been formatted to the Journal of Professional Nursing specifications and will be submitted for publication in 2023.

Abstract

Purpose: Providing breast milk to infants is more than a feeding decision; it is a significant public health concern. The impact of breastmilk improves both maternal and infant health, seen as short- and long-term health outcomes. However, healthcare providers' breastfeeding support and education are often insufficient to care for the breastfeeding dyad.

Description: This article presents the essential case for policy development to expand standardized breastfeeding education to nurses, who comprise the majority of healthcare workers. Providing a standardized breastfeeding education program for prelicensure nursing students (PNS) allows the most significant opportunity to optimize a positive influence on the breastfeeding dyad.

Assessment: A review of existing educational offerings for prelicensure nursing students (PNS) present a dearth of standardized breastfeeding curriculum. The Commission on Collegiate Nursing Education (CCNE) endorses the United States Breastfeeding Committee (USBC) Core Competencies in Breastfeeding Care and Services for All Health Professionals. The knowledge, skills, and attitudes in the core competencies can easily be adapted into the curriculum for prelicensure nursing programs.

Conclusion: Structuring a national Human Milk Feeding Education policy for prelicensure nursing programs accredited by the CCNE can mandate the inclusion of essential breastfeeding education, thereby optimizing breastfeeding initiation, duration, and exclusivity.

Keywords: breastfeeding, prelicensure nursing students, policy, health outcomes, core competencies

Highlights

- Breast milk consumption for the infant and the lactation process for the lactating parent improves short- and long-term health outcomes.
- Breastfeeding education for prelicensure nursing student (PNS) is inconsistent.
- A Human Milk Feeding Education policy for PNS integrating the USBC Core Competencies in Breastfeeding Care and Services for all Health Professionals has the potential to positively impact the breastfeeding dyad.

Purpose

All nurses have the opportunity to care for the breastfeeding dyad in any healthcare setting. Establishing a consistent human milk feeding curriculum for PNS and mandating its inclusion in nursing program curriculums can positively impact the breastfeeding dyads' health outcomes. In addition, the education can promote and support breastfeeding as a normative infant feeding practice for families (Ahmed et al., 2011; Campbell et al., 2022). Moreover, policy development to include the United States Breastfeeding Committee (USBC) Core Competencies in Breastfeeding Care and Services for all Health Professionals can increase the promotion, education, and support of lactating parents and their infants in the critical first hours of life (United Nations Children's Fund [UNICEF], 2016; WHO, 2018; Odom et al., 2013; Sriraman & Kellams, 2016; Rollins et al., 2016; USBC, 2010). This crucial breastfeeding policy mandates education regarding breastfeeding care and maintenance of lactation, which can increase breastfeeding rates and overall health of breastfeeding dyads.

Description

The curriculum in prelicensure nursing programs should be current and based on comprehensive guidelines grounded in evidence and research to prepare

knowledgeable and competent nurses. The National Council of State Boards of Nursing (NCSBN) guides content with the National Council Licensure Examination for Registered Nurses (NCLEX-RN®) detailed test plan (NCSBN, 2021). The NCLEX-RN exam tests potential nurses to certify they are qualified to safely practice nursing care at the entry-level (NCSBN, 2021). Nevertheless, even with this guidance from the NCSBN, the educational content on breastfeeding practices in existing nursing programs lack standardization (Campbell et al., 2022; Yang et al., 2018; Spatz, 2014).

Researchers describe substandard coverage of breastfeeding content in current nursing programs across the country (Ahmed et al., 2011; Campbell et al., 2022; Chuisano & Anderson, 2019; Yang et al., 2019; Spatz, 2014; Folker-Maglaya et al., 2018; Folker-Maglaya et al., 2020; Bozzette & Posner, 2013; Davis & Sherrod, 2015; Dodgson & Tarrant, 2007; Rhodes & Burgess, 2018; Vandewark, 2014; U.S. Department of Health and Human Services [USDHHS], 2011). Folker-Maglaya et al. (2018) argue that an introductory discussion on breastfeeding skills does not adequately prepare nursing students to care for the breastfeeding dyad. Multiple researchers recommend that the breastfeeding information provided to PNS be based on the United States Breastfeeding Committee (USBC) Core Competencies in Breastfeeding Care and Services for all Health Professionals (Spatz, 2014; Folker-Maglaya et al., 2018; Folker-Maglaya et al., 2020; Campbell et al., 2022; Rhodes & Burgess, 2018; USDHHS, 2011). The Core Competencies (Figure 4.1) provide standards for the knowledge, skills, and attitudes required to support the breastfeeding dyad. Although these guidelines are not all-inclusive of breastfeeding knowledge, it is a concise list to base breastfeeding curricula on for the generalist PNS.

The USBC (2010) stipulates that a PNS must primarily possess knowledge of the basics of human lactation, beginning with the anatomy and physiology of milk production and how human milk components affect health outcomes for both members of the breastfeeding dyad (USBC, 2010). In addition, PNS need to be informed of how birth practices, culture, and societal influences affect breastfeeding initiation, exclusivity, and duration. Societal influences include formula marketing, community resources, and lactation services available to families. The required knowledge base also encompasses the negative aspects, such as the few contraindications to breastfeeding and the risks of formula feeding (USBC, 2010).

Once PNS gain vital knowledge, they can develop the skills and attitudes to care for the breastfeeding dyad. The USBC (2010) lists required skills that include the overall promotion, protection, and breastfeeding support in their nursing practice. The skills are reinforced by completing a personal lactation health history and identifying factors in a parent's life that may affect the breastfeeding relationship. Additional skills involve seeking out lactation professionals and using technology for evidence-based care (USBC, 2010).

Expanded knowledge and competent skills promote attitudes that regard breastfeeding as a public health concern and support patients, family, friends, and breastfeeding practices (USBC, 2010). PNS must recognize their own biases and values that may affect their care of the breastfeeding dyad. A positive attitude can promote PNS's respect for cultural differences and the parents' breastfeeding decisions. Evidence-based information provided in the breastfeeding education can also make the

PNS aware of the influence of formula marketing and the impact on the breastfeeding dyad (USBC, 2010).

Implications

In the first hours of life, skin-to-skin care and breastfeeding initiation is positively associated with knowledgeable healthcare workers and the mother's self-efficacy (Lau et al., 2018). In addition, the literature points to breastfeeding support from healthcare workers, family, and friends to be a substantial component of mothers' self-efficacy (Lau et al., 2018; Bozzette & Posner, 2013). Unfortunately, PNS and other healthcare providers often receive inadequate education regarding how the initial care during the first hours of life and at the initial birth hospitalization can impact health outcomes of the breastfeeding dyad. Also missing is PNS educational preparation to promote and support breastfeeding as a normative infant feeding practice for families (Ahmed et al., 2011; Campbell et al., 2022). Therefore, a significant effort is needed to educate PNS on optimal breastfeeding behavior and its impact on health. In addition, policy development as a targeted measure can expand the breastfeeding dyad's support in all healthcare settings and the community. The expanded support for the breastfeeding dyad can potentially increase breastfeeding initiation, duration, and exclusivity rates.

The intent to breastfeed for a parent is a substantial factor in breastfeeding behaviors. A parent's intent can be augmented by encouragement and guidance from healthcare providers, family, and society (Spencer & Grassley, 2013; Sriraman & Kellams, 2016; Odom et al., 2013). When a lactating parent lacks reassurance and assistance from healthcare providers breastfeeding intent and overall success can negatively be impacted (Ahmed et al., 2011; Campbell et al., 2022; Anstey et al., 2017;

Odom et al., 2013). Currently, there is a sizable amount of research that investigates breastfeeding education, but much of the research is focused educate breastfeeding parents and current healthcare providers (Yang et al., 2018; Campbell et al., 2022). Reports of PNS breastfeeding education are limited in the literature, and even less research is available related to workable interventions to increase knowledge and attitudes. Unfortunately, some nursing programs may not provide breastfeeding education in their curricula.

Policy Recommendation

Drafting a Human Milk Feeding Education policy that incorporates a breastfeeding curriculum into the accrediting branch of the American Association of Colleges of Nursing (AACN) and the National League for Nursing (NLN) Commission for Nursing Education Accreditation (CNEA), can hopefully encompass all PNS. The Commission on Collegiate Nursing Education (CCNE), which accredits bachelor's programs, endorses the USBC's Core Competencies which provide clear guidelines for breastfeeding content inclusion. A similar endorsement is needed from the Accreditation Commission for Education in Nursing (ACEN), responsible for accrediting diploma and associate degree programs and some bachelor's programs. Having the CCNE, CNEA, and the ACEN implement a breastfeeding education policy would help to increase consistency in breastfeeding instruction across prelicensure nursing programs in the United States.

Curricular changes can be a lengthy and arduous process. Therefore, incorporating a mandated policy of integrating the breastfeeding module or toolkit in standards to accredit nursing programs would facilitate the implementation of the

curricular change. Evidence of the health impacts of optimal breastfeeding behaviors and the current abundance of successful breastfeeding educational programs in the literature supports this Human Milk Feeding Education policy change (Campbell et al., 2022; Yang et al., 2018). Folker-Maglaya et al. (2020) stress the inclusion of breastfeeding practices into educational offerings due to the protective nature of breastfeeding practices to reduce the risk against chronic illnesses such as Type 2 Diabetes, obesity, cancer, and cardiovascular disease. Healthcare-based organizations around the world advocate for reframing breastfeeding practices as a critical public health issue (AAP, 2012; HRSA, 2020; USDHHS, 2011; WHO, 2020; Spatz, 2014; Folker-Maglaya et al., 2020). Establishing a policy change that integrates standardized breastfeeding education in prelicensure nursing programs is one step closer to impacting the health and welfare of people across the United States.

Conclusion

Increasing the number of breastfeeding dyads worldwide who follow optimal breastfeeding practices provides the potential to save \$300 billion in healthcare expenditures, impact overall health outcomes, and prevent over 800,000 annual childhood deaths (World Health Organization [WHO], 2020). Despite the positive impact of breastfeeding, nearly 60% of mothers cannot meet their breastfeeding goals (Odom et al., 2013; Sriraman & Kellams, 2016; Rollins et al., 2016). Health care provider support in the acute care setting is one of the most important factors known to impact a placating parent's decision to initiate breastfeeding with their infant, as well as breastfeeding duration and exclusivity (Health Resources and Service Administration [HRSA], 2020; U.S. Department of Health and Human Services [USDHHS], 2011;

WHO, 2020). The U.S. Surgeon General's Call to Action targets expanded content in breastfeeding educational programs for nurses and emphasize the importance of breastfeeding practices (USDHHS, 2011).

The literature demonstrates the significance of optimal breastfeeding practices on improved health outcomes, thereby justifying the need to standardize breastfeeding education (Campbell et al., 2022, Yang et al., 2018; WHO, 2020; AAP, 2012; HRSA, 2020; USDHHS, 2011; Spatz, 2014; Folker-Maglaya et al., 2020). Currently, there is a lack of clear standards to guide breastfeeding education in the nursing program curricula around the United States (Campbell et al., 2022, Yang et al., 2018; Folker-Maglaya et al., 2018). By focusing on all PNS, providing proper education on care for the breastfeeding dyad can expand the impact to all areas of healthcare. In addition, directing the policy as part of the accreditation process for the CCNE and the ACEN may enforce the education's utilization at the entry-level for all nurses. Building the breastfeeding educational content based on the USBC (2010) Core Competencies is a comprehensive plan to structure essential breastfeeding content, including the fundamental knowledge, skills, and attitudes to promote optimal breastfeeding practices (USBC, 2010; Spatz, 2014; Folker-Maglaya et al., 2020).

Without a Human Milk Feeding Education policy advocating for the use of standardized breastfeeding education, the instruction provided to PNS can remain varied and inadequate (Folker-Maglaya et al., 2020). The continued insufficient knowledge and skills by nurses on care of the breastfeeding dyad can only compound the existing issues with optimal breastfeeding practices. A sustained deficiency in

proper education can perpetuate suboptimal health outcomes for our nation, affecting quality care and healthcare expenditures (WHO, 2020; USDHHS, 2011).

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Figure 4.1

Core Competencies in Breastfeeding Care and Services for All Health Professionals

Knowledge All health professionals should understand the:

- 1.1 basic anatomy and physiology of the breast
- 1.2 role of breastfeeding and human milk in maintaining health and preventing disease
- 1.3 importance of exclusive breastfeeding, and its correlation with optimal health outcomes
- 1.4 impact of pregnancy, birth, and other health care practices on breastfeeding outcomes
- 1.5 role of behavioral, cultural, social, and environmental factors in infant feeding decisions and practices
- 1.6 potentially adverse outcomes for infants and mothers who do not breastfeed
- 1.7 potential problems associated with the use of human milk substitutes
- 1.8 few evidence-based contraindications to breastfeeding
- 1.9 indications for referral to lactation services
- 1.10 resources available to assist mothers seeking breastfeeding and lactation information or services
- 1.11 effects of marketing of human milk substitutes on the decision to breastfeed and the duration of breastfeeding

Skills All health professionals should be able to:

- 2.1 practice in a manner that protects, promotes, and supports breastfeeding
- 2.2 gather breastfeeding history information sufficient to identify mothers and families who would benefit from specific breastfeeding support services
- 2.3 seek assistance from and refer to appropriate lactation specialists
- 2.4 safeguard privacy and confidentiality
- 2.5 effectively use [new information](#) technologies to obtain current evidence-based information about breastfeeding and human lactation

Attitudes All health professionals should:

- 3.1 value breastfeeding as an important health promotion and disease prevention strategy
- 3.2 recognize and respect philosophical, cultural, and ethical perspectives influencing the use and delivery of breastfeeding care and services
- 3.3 respect the confidential nature of the provision of breastfeeding care and services
- 3.4 recognize the importance of delivering breastfeeding care and services that are free of commercial conflict of interest or personal bias
- 3.5 understand the importance of tailoring information and services to the family's culture, knowledge, and language level
- 3.6 seek coordination and collaboration with interdisciplinary teams of health professionals
- 3.7 recognize the limitations of their own lactation knowledge and breastfeeding expertise
- 3.8 recognize when personal values and biases may affect or interfere with breastfeeding care and services provided to families
- 3.9 encourage workplace support for breastfeeding
- 3.10 support breastfeeding colleagues
- 3.11 support family-centered policies at federal, state, and local levels

United States Breastfeeding Committee. Core Competencies in Breastfeeding Care and Services for All Health Professionals. Rev ed. Washington, DC: United States Breastfeeding Committee; 2010.

Chapter 5 – Conclusion

Dissertation Review

The aim of this closing chapter is to summarize the dissertation work in its entirety regarding an examination of the breastfeeding attitudes of prelicensure nursing students (PNS).

Over ten years ago, the United States Surgeon General put out a Call to Action that emphasized the promotion of optimal breastfeeding practices through education and support of all lactating parents (USDHHS, 2011). As a result, breastfeeding rates have steadily improved, but the United States falls short of the Healthy People goals and may not achieve the 2030 metrics (USDHHS, 2020). Providing breastmilk to an infant is a personal decision based on knowledge and support, however this provision has an important impact on the health of the public. Often the choice to breastfeed is a very polarizing topic; however, the impact on health outcomes demands discussion in a non-biased manner (Mullan, 2015; Rollins et al., 2016). Other factors include cultural traditions and personal preferences, influenced by societal expectations and common misconceptions.

Researchers have reported that a common factor in lower than desired breastfeeding rates correlates to healthcare provider support and knowledge (Campbell et al., 2022; Yang et al., 2018; Victora et al., 2016; Sriraman & Kellams, 2016; Folker-Maglaya et al., 2018; Folker-Maglaya et al., 2020). There is also extensive evidence that a lack of support is a significant factor in the low breastfeeding rates that some racial and ethnic groups suffer (Reeves & Woods-Giscombé, 2015; Spencer & Grassley, 2013). Providing equitable support and education must be provided to all

lactating parents to achieve the metric set as a benchmark from government and healthcare-based organizations. It is estimated that nearly 60% of lactating parents do not achieve their own breastfeeding goals (Odom et al., 2013). Increasing breastfeeding education, promotion, and support go beyond healthcare-based directives and organizations.

There are numerous ways to impact the support and education lactating parents receive. The largest group of health care providers are nurses. If that education and support were targeted to prelicensure nursing students (PNS), the potential to impact childbearing or lactating families throughout society and the entire healthcare system would be enhanced. Researchers have provided ample evidence that increasing breastfeeding knowledge and support affect breastfeeding initiation rates in addition to duration and exclusivity. However, to date, there is a modest volume of standardized, evidence-based interventions that can be implemented in nursing programs. Therefore, the purpose of the dissertation was to evaluate the current state of the science on breastfeeding education for PNS, develop an evidence-based module, and evaluate its effectiveness.

Research Questions

1. Is there a difference in the undergraduate prelicensure nursing students breastfeeding attitude before (pretest score) and after (posttest score) participating in the evidence-based breastfeeding module (EBBM)?
2. What is the relationship between the prelicensure nursing student's breastfeeding awareness level and pretest breastfeeding attitude score?

3. Is there a relationship between age, gender identity, race/ethnicity, and country of birth and the pretest breastfeeding attitude score among prelicensure nursing students?
4. What is the relationship between the pretest breastfeeding attitude scores and posttest breastfeeding attitude scores of the two groups (Group 1 - Illinois cohort, group 2 - Wisconsin cohort)?

Discussion

The purpose of the dissertation study was to create an evidence-based breastfeeding module (EBBM) and examine the breastfeeding attitudes of prelicensure nursing students (PNS). The Theory of Planned Behavior (TPB) served as the framework for the study. Ajzen (2020) states that increased intent can increase the desired behavior. Therefore, it was hypothesized that if students can experience an enhanced positive breastfeeding attitude, they are more likely to provide better breastfeeding care. PNS need to comprehend the essential nature of breastmilk. The increased intent can promote breastfeeding, the importance of maintaining lactation, and the desire to seek support services for their patients. The study was guided by the adapted TPB theoretical framework seen in Appendix A.

The study was a quasi-experimental design utilizing a pretest-posttest methodology. A total of 73 PNS participated by completing a pretest and posttest survey after the EBBM was presented. Two of the research questions were supported by the evidence. First, a statistically significant number of participants experienced an increased breastfeeding attitude after the EBBM. The pretest sample mean was 62.23 (SD 4.9), and the posttest sample mean was 71.30 (SD 5.814). A score of 62.23 is

considered a Neutral breastfeeding attitude, whereas the posttest mean of 71.30 signified a Positive breastfeeding attitude using the Iowa Infant Feeding Attitude Scale (IIFAS) by de la Mora et al. (1999). The most impressive increase was 30 points from pretest to posttest, but the majority rose 12 points. The breastfeeding awareness levels were positively correlated with the pretest breastfeeding attitude. However, the correlation was small and required further testing to determine substantiality.

The two research questions not supported by the evidence were the demographic data of age, gender, race/ethnicity, and country of birth affecting the pretest breastfeeding attitude. This could be due to the modest sample size or diversity of the participants. Secondly, there was no significant difference between the PNS cohorts. Some differences were expected due to the different geographic areas and the composition of the cities where the university was located.

Overall, the dissertation study effectively established the EBBM positively impacted the breastfeeding attitudes of the participating PNS. The EBBM was developed based on the USBC (2010) Core Competencies in Breastfeeding Care and Services for **All** Health Professionals (Appendix B), and the infant feeding chapter in the Lowdermilk et al. (2020) textbook. In addition, the findings enable future research to expand on the intervention tested.

Limitations

One limitation of the dissertation study was the lack of random assignment. Every eligible PNS received the EBBM lecture as part of the mandatory course content. Participation in the pretest and posttest surveys was voluntary. Future research designs could include a random assignment for evaluating the EBBM. However, a carefully

structured interventional design would be required to ensure all PNS still receive required breastfeeding education.

Another limitation relates to the potential threat to validity inherent in self-reported data. The students self-reported their demographic data, breastfeeding awareness level and breastfeeding attitudes for the IIFAS pre-and post-survey. The Breastfeeding Awareness level was an author developed data collection tool. Therefore, further testing of the validity and reliability of the tool is recommended. In addition, the sample population mirrored the demographics of the nursing profession in general, which is made up mostly of non-Hispanic/White females (Rauner & Schneider, 2017; Smiley et al., 2021). While some race/ethnicity and gender variations were seen, it was not a significant percentage. Therefore, a generalization of the findings to a more diverse population may not be valid.

An additional limitation or point of concern was the delivery of the EBBM between the university settings. Both EBBM lectures were presented live using the same PowerPoint presentation and script. However, the Illinois university presentation was in person, whereas the Wisconsin presentation was via Zoom. The in-person presentation elicited a considerably higher number of questions and feedback from the PNS that was absent from the online delivery. That could have been due to differences in the cohort groups or the lack of a face-to-face environment. However, the differences in the PNS cohorts were not statistically significant based on the demographic variables.

A final concern relates to the experience and dedication of the faculty member who presented the EBBM. This individual had a background as an Internally Board-Certified Lactation Consultant (IBCLC) and may have delivered the content with more

enthusiasm and knowledge than a faculty member who was not an IBCLC that influenced the students' perspective. The data analysis demonstrated statically significant results for both cohorts, so that this additional influence may have been minimal. However, the issue becomes replication of the study and how or whether that level of content enthusiasm might affect other populations.

Policy Recommendation

Nurses and other healthcare providers can use the findings of this study and the previously accomplished research to facilitate organizational and societal policy changes. Directing the focus on the accrediting bodies of the American Association of Colleges of Nursing (AACN), Commission on Collegiate Nursing Education (CCNE), and the Accreditation Commission for Education in Nursing () may ensure a wide-reaching recommendation of the vital breastfeeding content. Using the USBC (2010) Core Competencies in Breastfeeding Care and Services for **All** Health Professionals will also guarantee that the needed knowledge, skill, and attitudes are included in the content. Nurses can provide important leadership to highlight changes that need to occur on healthcare and lactation care inequities will lead to future work to decrease health disparities concentrated in maternal-infant health. Certifying that each nursing program covers this essential curriculum also allows the content to be delivered to all PNS's as part of their entry-level education. As expected, PNS who specialize in care of childbearing families will need and hopefully receive additional breastfeeding education. However, since nurses make up the most significant healthcare group providing this education at the entry-level will make sure every nurse has some general knowledge. Utilizing the currently endorsed USBC (2010) Core Competencies is a wise step

towards policy change. In addition, the curriculum is evidence-based and contains the vital cultural care-element required to address the breastfeeding disparities already seen in the United States.

Cultural Disparities

Throughout the dissertation, breastfeeding disparities have been emphasized numerous times. While there is a racial and ethnic component to the disparities, the common underlying issue in all races is support for the breastfeeding dyad. The support is lacking primarily from healthcare workers and those who care for lactating parents at the bedside (Reeves & Woods-Giscombé, 2015). Increasing the education regarding the health impact breastfeeding provides is not the answer. Most lactating parents understand the significance that breastfeeding has on the health of the parent and infant. However, what parents reported that they experience is a lack of provider support (Jones et al., 2015; Thomas, 2018). For African Americans and other marginalized and at-risk populations, the history of systemic racism and disrespect has expanded the breastfeeding care gap (Jefferson, 2013; Bai et al., 2011; Beauregard et al., 2019). A generational effect dating back to slavery has led to an environment where breastfeeding is no longer a normalized practice especially seen in the African American community (Jones et al., 2015; Spencer & Grassley, 2013). Inequitable care and institutionalized racism have compounded the effects of health promotion and susceptibility to chronic conditions (Walsh, 2012; Reeves & Woods-Giscombé, 2015; Spencer & Grassley, 2013).

Establishing an evidence-based breastfeeding curriculum that includes culturally humble approach to the care for all people may will decrease the continuation of

disparate care provided to lactating parents. The USBC (2010) Core Competencies include a cultural component focusing on knowledge, skills, and attitudes. The inclusion of breastfeeding educational modules such as the EBBM in nursing programs expands the reach of culturally sensitive care for all nurses.

Further Research Recommendations

A future research consideration is to create a similar study design but expand data collection into a longitudinal assessment of how positive breastfeeding attitudes continue in the PNS's nursing career. For example, does the PNS feel more confident providing care to breastfeeding dyads because of the foundational content presented in their nursing program? In addition, do the knowledge, skills, and attitudes gained from the EBBM continue in the PNSs' career and personal lives?

Future research can expand the scope and diversity of PNS populations' studies using a similar study design. In addition to increasing the population size, managing attrition could be achieved with small monetary incentives for PNS who complete both the pretest and posttest. An 8% attrition rate was seen in the current study. Sampling a larger population in more significant geographic areas may expand the generalizability of the findings and support the findings of this initial study. If future research can replicate the findings, increased emphasis can be placed on determining the feasibility of a comprehensive policy to add the EBBM or a similar module into nursing programs around the country. Dissemination of the findings can lead to policy change and one more step toward reaching the breastfeeding goals of the WHO and other healthcare organizations (USDHHS, 2011, WHO, 2021).

Another objective for future research would be to investigate the Breastfeeding Awareness measurement tool for reliability and validity. The current study utilized the tool for collecting the PNS breastfeeding awareness level before the EBBM. However, without future examination of the measurement tool, it is difficult to determine if it is effective and can be used on other populations.

Finally, qualitatively expanding the focus of breastfeeding education would provide a greater understanding of the EBBM intervention and its success. Collecting qualitative data would highlight the perspective of the PNS to determine what knowledge, skills, and attitudes were the most beneficial. Combining qualitative data collection with a longitudinal study design could advance practical interventions to educate PNS that can affect the care they provide lactating parents and children throughout their careers.

Conclusion

The cumulation of years of clinical and educational experience spurred the chosen dissertation topic of breastfeeding education for PNS. However, as the dissertation work continued, a wealth of evidence increased the sense of urgency to create feasible interventions to change the state of breastfeeding education for entry-level nurses. The two leading causes of death for adults in the United States are cancer and heart disease. More robust evidence demonstrates how the process of lactation and breast milk impacts the short-term health of lactating parents and their infants and can also affect long-term health and mitigate the effects of chronic conditions (APA, 2012, Tschiderer et al., 2022). Healthcare organizations and providers viewing breast milk as a public health concern more than just a feeding choice will push breastfeeding

as the normative infant feeding method (APA, 2012; Rollins et al., 2016). The increased education of nurses will enhance the knowledge, skills, and attitudes needed to care for the breastfeeding dyads. Increasing supportive measures beginning in the prenatal period, throughout pregnancy, and into the postpartum period are required. Increasing overall emphasis and cultural awareness can impact marginalized groups who have historically suffered from a lack of care and support.

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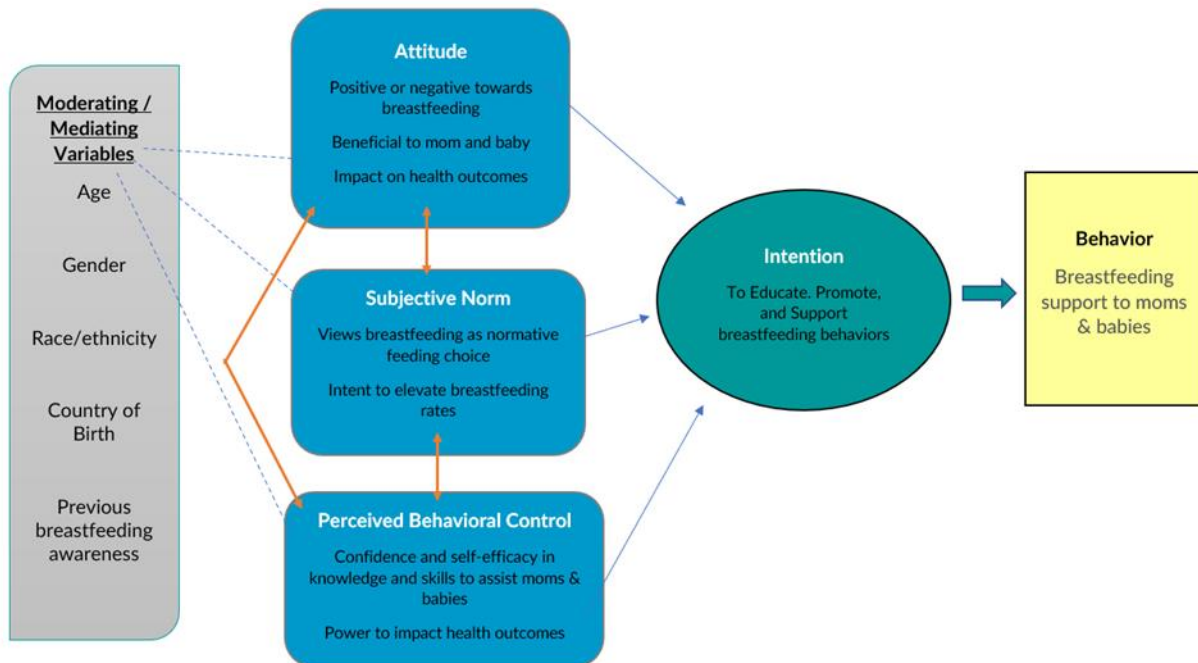
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Appendix A

Nursing Students Breastfeeding Attitude Based on the Theory of Planned Behavior (Ajzen, 2020)



Appendix B

Core Competencies in Breastfeeding Care and Services for All Health Professionals

Knowledge All health professionals should understand the:

- 1.1 basic anatomy and physiology of the breast
- 1.2 role of breastfeeding and human milk in maintaining health and preventing disease
- 1.3 importance of exclusive breastfeeding, and its correlation with optimal health outcomes
- 1.4 impact of pregnancy, birth, and other health care practices on breastfeeding outcomes
- 1.5 role of behavioral, cultural, social, and environmental factors in infant feeding decisions and practices
- 1.6 potentially adverse outcomes for infants and mothers who do not breastfeed
- 1.7 potential problems associated with the use of human milk substitutes
- 1.8 few evidence-based contraindications to breastfeeding
- 1.9 indications for referral to lactation services
- 1.10 resources available to assist mothers seeking breastfeeding and lactation information or services
- 1.11 effects of marketing of human milk substitutes on the decision to breastfeed and the duration of breastfeeding

Skills All health professionals should be able to:

- 2.1 practice in a manner that protects, promotes, and supports breastfeeding
- 2.2 gather breastfeeding history information sufficient to identify mothers and families who would benefit from specific breastfeeding support services
- 2.3 seek assistance from and refer to appropriate lactation specialists
- 2.4 safeguard privacy and confidentiality
- 2.5 effectively use [new information](#) technologies to obtain current evidence-based information about breastfeeding and human lactation

Attitudes All health professionals should:

- 3.1 value breastfeeding as an important health promotion and disease prevention strategy
- 3.2 recognize and respect philosophical, cultural, and ethical perspectives influencing the use and delivery of breastfeeding care and services
- 3.3 respect the confidential nature of the provision of breastfeeding care and services
- 3.4 recognize the importance of delivering breastfeeding care and services that are free of commercial conflict of interest or personal bias
- 3.5 understand the importance of tailoring information and services to the family's culture, knowledge, and language level
- 3.6 seek coordination and collaboration with interdisciplinary teams of health professionals
- 3.7 recognize the limitations of their own lactation knowledge and breastfeeding expertise
- 3.8 recognize when personal values and biases may affect or interfere with breastfeeding care and services provided to families
- 3.9 encourage workplace support for breastfeeding
- 3.10 support breastfeeding colleagues
- 3.11 support family-centered policies at federal, state, and local levels

United States Breastfeeding Committee. Core Competencies in Breastfeeding Care and Services for All Health Professionals. Rev ed. Washington, DC: United States Breastfeeding Committee; 2010.

CURRICULUM VITAE

Stephanie D. Uhr, PhD (c), MS, RN, IBCLC

Education

- Doctorate in Philosophy (PhD) August 2022
University of Wisconsin-Milwaukee, Milwaukee, Wisconsin
Concentration: Nursing
- Master of Science Degree (MS) May 2014
Northern Illinois University, DeKalb, Illinois
Concentration: Nursing Education
- Bachelor of Science Degree (BS) December 1997
Northern Illinois University, DeKalb, Illinois
Major: Nursing Minor: Biology
- Associate of Science (AS) December 1994
Harper College, Palatine, Illinois
Major: Biology

Teaching Experience

- Northern Illinois University – DeKalb, Illinois August 2014 - Present
Nursing Instructor
- Pre-licensure Courses
 - Professional Nursing (NURS 302)
 - Nursing Care of the Childbearing Family (NURS 319)
 - Childbearing Family Clinical (NURS 343)
 - Critical Thinking for the Health Care Professional (NURS 349X)
 - RN-BS Completion Program Courses:
 - Concepts and Issues of Professional Nursing (NURS 347)

Clinical Experience

- Northwestern Medicine Huntley Hospital – Huntley, Illinois**
(previously Centegra Health System) September 2001 – Present
Lead Lactation Consultant - Breastfeeding Resource Center

- Chair, Baby Friendly Hospital Initiative Task Force
- Team Lead for the creation of the Breastfeeding Resource Center
- Lactation Scheduler
- OB Core Measures Analyst
- Annual lactation policy creation and revision

- Develop educational requirements of unit nurses
- Liaison for the community and the health system
- Awarded a grant to obtain equipment to provide best practice care for ICN babies
- Care for breastfeeding mothers and infants in the in-patient, out-patient, telephone triage, and support group settings
- Prenatal classes in labor preparation, infant care, breastfeeding, sibling preparation

Registered Nurse

- Mother/Baby
- Labor and Delivery
- Intermediate Care Nursery

Rockford Health System – Rockford, Illinois

April 1999 - September 2001

Registered Nurse – Maternal Fetal Medicine

- Assist perinatologist with various procedures
- Perform ultrasound examinations, fetal monitoring, and interpretation
- Provide patient education and telephone triage
- Manage daily office functioning. Requisition medical and office supplies. Function as liaison between office and hospital units.
- Coordinate and implement new policies and procedures.

Sherman Hospital – Elgin, Illinois

January 1998 - April 1999

Registered Nurse

- Mother/Baby
- Labor and Delivery

Professional Awards

Nurses Educational Funds, Inc. (NEF)

- NEF Scholar 2021-2022
- Miriam M. Powell Scholarship Award
- June 2021

Northern Illinois University

- Excellence in Undergraduate Teaching Award
 - Spring 2022 - award recipient
 - Spring 2020 – College of Health and Human Sciences nominee

Centegra Health System

- Shining Star Award – January 2013

Professional Presentations

Health Research Symposium, University of Wisconsin - Milwaukee

- Nursing Students Attitudes Regarding Breastfeeding Education
- May 16, 2022
- Winner: Outstanding Project Abstract

Midwest Nursing Research Society (MNRS) Annual Conference, Schaumburg, Illinois

- Nursing Students Attitudes Regarding Breastfeeding Education
- March 31, 2022

Sigma – Eta Nu Chapter, University of Wisconsin - Milwaukee

- Chapter Membership Educational Session - Featured Presenter
- The Impact of Breastfeeding on Health Outcomes
- February 17, 2022

Sigma – Eta Nu Chapter, University of Wisconsin - Milwaukee

- Nursing Students Attitudes Regarding Breastfeeding Education
- November 11, 2021

Health Research Symposium, University of Wisconsin - Milwaukee

- The Iowa Infant Feeding Attitude Scale (IIFAS) - An Application with Nursing Students Breastfeeding Attitudes
- May 7, 2021
- Winner: Outstanding Scientific Significance and Impact

Sigma – Eta Nu Chapter, University of Wisconsin - Milwaukee

- Iowa Infant Feeding Attitude Scale (IIFAS)
- November 12, 2020

Centegra Health System

Fall Nursing Symposium – Poster presentation

- Baby Friendly Hospital Initiative
- September 2016

Fall Nursing Symposium – Guest Lecturer

- Supporting Breastfeeding Mothers and Infants
- November 2012

Registration

- Registered Professional Nurse, IL - 041-308289

Certifications

- International Board-Certified Lactation Consultant (IBCLC) 107-26102
- Neonatal Resuscitation (NRP)
- CPR

Service to Northern Illinois University

School of Nursing, Undergraduate Curriculum and Evaluation Committee

- Instructor Volunteer/Member August 2019 - present
- Secretary August 2017- August 2018

School of Nursing, Student Nurses Organization (SNO)

- Faculty Advisor January 2016 – Present

School of Nursing, Course Facilitator (previously Course Coordinator)

- Third Track - Nurs 319 & Nurs 343 August 2019 - Present

School of Nursing, Simulation Subcommittee

- Member August 2018 – Present

School of Nursing, First Track Restructure Task Force

- Lead August 2016 – August 2017

Northern Illinois University, STEM fest

- Student Nurses Organization (SNO) table planner/presenter
- October 2016, 2017, 2018, 2019, 2021

Northern Illinois University, Student Nurse Political Action Day

- Planner and participant
- Spring 2016, 2017, 2018, 2019, 2022

Service to the Greater Community

Sigma Theta Tau International – Honor Society of Nursing

- Eta Nu Chapter Member 2019 - Present
- Beta Omega Chapter Member 1996 - Present

International Lactation Consultants Association

- Member 2007 – Present

Association of Women’s Health, Obstetric, and Neonatal Nurses (AWHONN)

- Member 2000 - Present

Midwest Nursing Research Society (MNRS)

- Member 2020 – Present