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Implementing a Breastfeeding Toolkit for Nursing Education

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ABSTRACT

All health professional organizations recommend exclusive breastfeeding for at least 6 months, with continued breastfeeding for 1 year or more after birth. Women cite lack of support from health professionals as a barrier to breastfeeding. Meanwhile, breastfeeding education is not considered essential to basic nursing education and students are not adequately prepared to support breastfeeding women. Therefore, a toolkit of comprehensive evidence-based breastfeeding educational materials was developed to provide essential breastfeeding knowledge. A study was performed to determine the effectiveness of the breastfeeding toolkit education in an associate degree nursing program. A pretest/posttest survey design with intervention and comparison groups was used. One hundred fourteen students completed pre- and posttests. Student knowledge was measured using a 12-item survey derived with minor modifications from Marzalik's 2004 instrument measuring breastfeeding knowledge. When pre- and posttests scores were compared within groups, both groups' knowledge scores increased. A change score was calculated with a significantly higher mean score for the intervention group. When regression analysis was used to control for the pretest score, belonging to the intervention group increased student scores but not significantly. The toolkit was developed to provide a curriculum that demonstrates enhanced learning to prepare nursing students for practice. The toolkit could be used in other settings, such as to educate staff nurses working with childbearing families.

Key Words: breastfeeding, breastfeeding knowledge, curriculum, lactation education, nursing education, nursing student

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Breastfeeding is the preferred infant feeding method, as it is associated with decreased risk for infant and maternal morbidity and mortality.[1–6] The Healthy People 2020 objectives for breastfeeding include increasing the number of infants ever breastfed to 81.9%, those breastfed until 6 months to 60.6%, and those exclusively breastfed at 6 months to 25.5%.[7] While US breastfeeding rates have increased to 81.1% for infants ever breastfed, 51.8% for infants breastfed for 6 months, and 22.3% for infants exclusively breastfed at 6 months in 2016, these rates are not yet at the 2020 targets.[8] The World Health Organization in its efforts to improve infant and maternal nutrition has endorsed a number of 2025 targets, which include at least 50% of infants receive at least 6 months of exclusive breastfeeding.[9]

Women cite lack of support by healthcare professionals as a barrier to successfully attaining their breastfeeding goals.[2,6,10] The literature suggests that

healthcare professionals may not have the knowledge to effectively support women with breastfeeding.[1,6,10,11] In addition, women seek breastfeeding advice from healthcare professionals, yet information provided to them is often inconsistent or conveys conflicting messages that can negatively affect their breastfeeding experiences.[10] Breastfeeding support is often based on personal experiences versus the evidence or best practice, and that training is warranted to develop consistent messages for women.[10,12,13]

Weddig et al[11] performed a qualitative study on nurses' perspectives of breastfeeding initiation best practices.[11] The purpose of the study was to assess nurses' knowledge and practices, as well as hospital policies related to the initiation and support of breastfeeding. While the nurses were found to have a "pro breastfeeding stance,"[11(p169)] nurses from hospitals without Baby-Friendly[14] designation did not use evidence-based practices.

Nurses report that the expectation to support breastfeeding women and families does not match their preparation, especially when attempting to attain the Baby-Friendly hospital designation.[15] With only 3.79 International Board Certified Lactation Consultants for every 1000 live births in the United States,[16] bedside nurses are frequently the primary providers of lactation education and support for breastfeeding families.[17] In a 2016 study of 889 healthcare professionals (391 nurses and 297 nursing students) in Nevada, the baseline knowledge and attitude scores were low and indicated minimal change in breastfeeding knowledge for healthcare professionals over 10 years.[18]

While health outcomes are improved with exclusive breastfeeding and human milk feedings,[2,5] more than half (52%) of very low birth-weight infants are discharged from the neonatal intensive care unit (NICU) on formula only.[19] Hallowell et al[20] examined the association of the NICU work environment along with nurse-reported breastfeeding support and the practice of infants discharged on human milk. The study found 49% of NICUs did not have Lactation Consultants, and only 14% of infants in the sample received nurse-reported breastfeeding support. Nurses reported breastfeeding support was provided to 1 to 5 parents across shifts. NICUs with better staffing ratios and more experienced nurses had more parents receiving breastfeeding support. In addition, NICUs with more baccalaureate-prepared nurses had more very low birth-weight infants discharged on human milk.[20]

A qualitative study of healthcare professionals' attitudes and practices in supporting breastfeeding in a NICU found, that while nurses were aware of the importance of breastfeeding support, they felt their knowledge about breastfeeding was inadequate.[21] This feeling of inadequacy led to a lack of confidence in providing lactation education to the mothers.[21] Hospital administration responded to concerns such as these by seeking Baby-Friendly designation by offering the required 20 hours of education and training.[22]

The Children's Hospital of Philadelphia developed a 2-day course, the Breastfeeding Resource Nurse (BRN) program focused on the science of human milk and breastfeeding and the nurses' role in providing evidence-based lactation care and support. In the BRN program, participants learn by didactic methods, case study, group participation activities, and skills demonstration.[23] Research conducted on the outcomes of the BRN program demonstrated that 90% of nurses provide direct breastfeeding education, support, and care,[24] which is significantly higher than the mere 14% reported in the national sample conducted by Hallowell and colleagues.[20]

Qualitative research on the BRN program found that participants were "empowered through evidence" and were "willing to go the extra mile" because of the knowledge gained through the course.[25] In addition, nurses verbalized their important role in serving as advocates for human milk and breastfeeding.[25] It is clear that breastfeeding education is essential, and in this example practicing nurses and hospital administration created a feasible in-house solution to improve lactation education provided. However, to move breastfeeding initiation and continuation rates forward nationally, basic breastfeeding support skills incorporated in all healthcare professional educational programs need to be an expectation not a unique solution.

The reality remains that practicing nurses encounter breastfeeding women and children in a variety of patient care settings including hospitals and the community. However, breastfeeding education is not considered a *core element*[6(p46)] in nursing and professional health education.[6,26,27] Providing *substantial*[28(p418)] education in nursing programs will provide future nurses with the foundation needed to support breastfeeding women and families.[28] Practicing nurses need these skills to appropriately mentor new graduates and orientees, as well as nursing students in the clinical setting.

There are limited studies that specifically address breastfeeding education in nursing curricula. While studies have shown growth in breastfeeding knowledge from breastfeeding education,[29] findings have suggested that basic nursing education does not adequately prepare students to assist breastfeeding families.[30–36] Instructional methods used for teaching breastfeeding consist primarily of readings and lecture, with fewer opportunities for modeling and role-play.[35] Spatz and Pugh[36] asserted that breastfeeding should be integrated throughout the curriculum, with a

minimum of 2 hours devoted to the topic in both maternal-newborn and pediatrics courses, inclusive of planned clinical experiences to better prepare nursing students to support breastfeeding families.

A needs assessment of maternal-newborn faculty was conducted in a Midwest associate degree nursing program prior to implementing a breastfeeding curriculum. The assessment revealed that (1) there were no standardized learning objectives about breastfeeding, (2) less than 1 hour of class time was spent on breastfeeding content, and (3) content generally focused on benefits and common problems associated with breastfeeding. The literature does not support a specific curriculum or best methods for facilitating learning about breastfeeding for nursing students. The United States Breastfeeding Committee 2010 revision provides core competencies for breastfeeding care for all health professionals; the Committee asserted "educators are in a unique position to lead the way by incorporating these core competencies into the undergraduate, graduate, and post-graduate curricula."[37(p3)]

Use of a Web-based breastfeeding curriculum, such as the self-study learning modules from Wellstart International,[38] was considered. Time constraints including an overladen curriculum and the reality of a 4-week long maternal-newborn health course led to the development of the evidence-based breastfeeding toolkit being tested in the current research.

A conceptual framework was selected for the breastfeeding curriculum to guide the organization and implementation of the study. Webber defines nursing as "the desire to, intent, and obligation to apply discipline-specific-knowledge, skills, values, meanings, and experience (KSVME) for, with, or on behalf of those requiring and/or requesting assistance in achieving and maintaining their desired state of health and/or well-being."[39(p17)] With the recognition that effective learning is achieved through the use of creative strategies to inform and stimulate,[40] a multi-instructional methodology was used to meet the needs of different student learning styles and to foster positive attitudes for breastfeeding support.

Development of the toolkit was guided by the United States Breastfeeding Committee core competencies,[37] and maternal-newborn faculty input. The comprehensive evidence-based education about breastfeeding included (1) student learning objectives, (2) lesson plan, (3) 3-part voice-over PowerPoint presentation with required and optional hyperlinks, (3) online unfolding case study with questions addressing communication and critical reasoning skills and rationales for correct and incorrect responses, (4) role-play activity, and (5) skill checklists for the breastfeeding content of the nursing curriculum for maternal-newborn nursing. The toolkit content was reviewed by 3 doctoral prepared nurse educators with special interest in lactation.

OBJECTIVE

A pilot study was performed to determine the effectiveness of the toolkit education by measuring pre- and posttest scores.

METHODS

Design

A pretest/posttest survey design with an intervention and a comparison group was used for the study. The comparison group received the standard instruction planned by the course instructor while the intervention group received the toolkit education. The research was approved by the institutional review board of the institution where the study took place. Student identity was protected by removing the identification number provided by the student and having a researcher who had no contact with participants conduct the analysis of data.

Setting

The study was conducted in a Midwestern urban community college associate degree nursing program. Data were collected in the fall semester of 2016.

Sample

Following institutional review board approval, recruitment of second year (senior) nursing students enrolled in the maternal-newborn nursing courses was conducted. The maternal-newborn course and the clinical were a total of 4 weeks in length. An announcement was posted on the maternal-newborn course learning management system platform, and an e-mail was sent a few days prior to the start of the classes inviting students to participate in the study. Students in maternal-newborn courses offered weeks 5 through 8 of the semester were assigned to the control group, and students from the courses offered weeks 9 through 12 were assigned to the intervention group. Faculty for the classes in the control group were the same as faculty for the classes in the intervention group. The principal investigator presented the first day of class to promote participation and answer questions about the study, and was also present at the last day of class for the posttest. The sample consisted of 114 participants, 54 in the control group and 60 in the experimental group.

Students in the control group received education on breastfeeding as part of the 1-hour postpartum lecture in preparation for attending clinical. The faculty member providing the education was either the course or clinical faculty. There were no standardized objectives or topic areas and no assignments other than course readings on breastfeeding content.

Table 1 summarizes the breastfeeding toolkit content. Timing for breastfeeding toolkit education in the 4-week course was selected by the course faculty member. The toolkit was implemented by following the lesson plan. Students were instructed to come prepared to the breastfeeding class after viewing the 3-part voice-over PowerPoint presentation and reading the role-play activities. Class began with a video on self-attachment of the newborn followed by an interactive lecture using visuals and props (breast model, life-sized doll, and breast pump). Students paired with classroom partners and role-played assisting a new mother with comfortable positioning and latch. A 5-minute demonstration with instructions was then provided by the principal investigator on use of a double-electric breast pump to assist a new mother separated from her baby to initiate lactation. The class time ended with a question-and-answer session.

The unfolding case study was assigned on the learning management system course platform that could be accessed by the students at any time. The case study addressed breastfeeding support beginning with the client's first prenatal visit through the first 2 weeks postpartum.

Faculty members were encouraged to reinforce the education and provide students opportunities for practice in the clinical setting. Any additional information about breastfeeding would have been provided by the classroom and clinical faculty members depending on opportunities in the clinical setting. The toolkit did not include any planned content for the clinical portion of the course.

Table 1. Breastfeeding Toolkit

1. Lesson plan (6 learning objectives)
   - Examine at least 3 benefits of exclusive breastfeeding and at least 3 risks of formula feeding for mother and child
   - Discuss the importance of early initiation and frequent breastfeeding and its effect on lactation physiology
   - Evaluate adequacy of the newborn's intake
   - Implement strategies for the prevention and treatment of common problems associated with breastfeeding
   - Role-play assisting a first-time breastfeeding mother with positioning and latch-on techniques
   - Demonstrate assembly of a double-electric breast pump attachment and provide instructions for the initiation of lactation for the mother separated from her baby
2. Three-part voice-over PowerPoint presentation (student preparation for class and clinical; 80 min)

Part 1: Facilitating breastfeeding
   - Benefits of exclusive breastfeeding and risks of formula feeding
   - Cultural variances
   - Ethical and legal responsibilities of nurses
   - Barriers to breastfeeding, and empowering women

Part 2: Breastfeeding-friendly initiatives and getting off to a good start
   - Initiatives promoting breastfeeding
   - Physiology of lactation
   - Early initiation of breastfeeding

Part 3: Ensuring adequacy of intake, special situations, and support
   - Assessing for adequacy of intake
   - Prevention and management of common problems associated with breastfeeding
   - Initiation of lactation when separated from the baby
   - Professional support; literature and Web-based resources for women and professionals

2-3 questions are posed at the end of each part with references provided

3. Unfolding online case study on student learning LMS platform; accessible 24/7 (student preparation for class and clinical; 30 min)
4. Breastfeeding class lecture focusing on objectives (50 min)
5. Demonstration: Initiation of lactation when separated from the baby (with skills checklist [rubric]; 5 min)
6. Demonstration and role-play: Assisting a first-time breastfeeding mother (with skills checklist [rubric]; 20 min)

Total time = 185 min or 3.08 h (~2 h for student preparation)

Abbreviation: LMS, learning management system.

Measurement

Students enrolled in the study responded to demographic questions of age, gender, whether the participants or their partner ever breastfed, whether the breastfeeding experience was positive or negative, and whether the participant would recommend breastfeeding. The primary portion of the measurement instrument was a 12-item pretest and identical posttest on breastfeeding knowledge. The pre- and posttest items were derived with minor modifications from Marzalik's 2004 instrument measuring breastfeeding knowledge addressing 3 areas: anatomy and physiology of lactation science; risks of formula feeding and contraindications to breastfeeding; and breastfeeding support.[28] The response options were true, false, and unsure. Marzalik's instrument was found to have reliability with a Cronbach α coefficient of 0.78. Although Marzalik's tool included 39 breastfeeding knowledge questions, the survey in this study was limited to 12 items, with 25% pertaining to anatomy and physiology, 25% to risks of formula feeding, and the remaining 50% pertaining to breastfeeding support, thus aligning with the learning objectives.

Data collection

Data were collected from September 2016 to November 2016. Of 174 eligible students, 114 students consented and completed pre- and posttests. Students accessed the informed consent, demographic questions, and the pretest via Qualtrics at the start of the first maternal-newborn class and the posttest at the end of the course. Students' pre- and posttests were matched using student identification number and then all study data were deidentified.

Data analysis

The primary aim of this study was to determine the effectiveness of the toolkit of breastfeeding education by measuring nursing student pre- and posttest knowledge scores. Total numbers of items correct were calculated for members of control and intervention groups; a group mean was determined within groups. An improvement score was also calculated for each respondent and the mean improvement was calculated for each group. Means were evaluated using an F test to determine whether the variances were equal or not within each group in preparation for using the correct type of t test. To determine whether the control and intervention groups had different pre-, post-, and improved test scores, t tests were used. The results of the t tests led to more questions about group differences, and the researchers sought to understand them through the use of linear regressions predicting the posttest score. The benefit of using regressions in the analysis is the ability to use multiple predictors of posttest scores at once and to be able to control for key variables.

RESULTS

Of the 114 participants, 54 (47%) were from the control course sections and 60 (53%) were from the course sections who received the toolkit education intervention. The control group included 44 (81%) females and 10 (19%) males, while the intervention group included 49 (82%) females and 11 (18%) males. Table 2 summarizes characteristics of the participants.

Table 3 summarizes the pre- and posttest responses of students.

Table 4 summarizes the mean items correct and mean change in items correct for the control and intervention groups. While the control group (mean = 6.43, standard deviation [SD] = 2.26) score was higher on the pretest compared with the intervention group (mean = 5.72, SD = 2.26), this difference was not statistically significant. The posttest scores were also statistically similar between the 2 groups. When the pre- and posttest scores were compared within groups, the scores were significantly different from one another, demonstrating that both groups grew in the intervening time ($p < .001$). A change score was calculated for each respondent to capture this growth. The mean change score for the intervention group (mean = 2.97, SD = 2.23) was significantly higher ($p < .05$, 2-tailed t test) than that for the control group (mean = 2.02, SD = 1.91).

Because of the unequal pretest scores among the respondent groups, a series of linear regressions were conducted to assess whether membership in the intervention group made a difference in the posttest score. The first regression used only intervention group membership to predict posttest scores. Results are displayed in Table 5, model 1. Those in the intervention group were predicted to have higher posttest scores, but there is not a significant difference. This finding is consistent with the prior analysis of mean scores. Next, posttest scores were predicted from pretest scores, and the result of this regression is shown in Table 5, model 2. For each additional question answered correctly on the pretest, respondents were predicted to score about one-third question higher on the posttest score. Table 5, model 3, provides the 2 predictors combined. This regression shows that membership in the intervention group did not make a significant difference in posttest scores when controlling for pretest scores. Also, the pretest score is a predictor of the posttest score in both groups.

Table 2. **Characteristics and attitudes of students in control, intervention, and study total groups**

Groups	Control *n* (%)	Intervention *n* (%)	Study total *n* (%)	Study total posteducation *n* (%)
Total	54 (47)	60 (53)	114 (100)	114 (100)
Gender				
Female	44 (81)	49 (82)	93 (82)	
Male	10 (19)	11 (18)	21 (18)	
Ethnicity				
Asian	13 (24)	2 (3)	15 (13)	
Black, non-Hispanic	9 (17)	19 (32)	28 (25)	
Hispanic	19 (35)	20 (33)	39 (34)	
White, non-Hispanic	7 (13)	17 (28)	24 (21)	
Multirace indicated	4 (7)	2 (3)	6 (5)	
Other	2 (4)	0 (0)	2 (2)	
Breastfeeding experience				
Positive	27 (50)	22 (37)	49 (43)	
Negative	3 (6)	4 (7)	7 (6)	
No experience	24 (44)	34 (57)	58 (51)	
Recommend breastfeeding				
Yes	49 (91)	54 (90)	103 (90)	108 (95)
No	1 (2)	1 (2)	2 (2)	3 (2)
Maybe	4 (7)	5 (8)	9 (8)	3 (2)

When regression analysis was used to control for pretest scores, belonging to the intervention group increased student scores but not significantly.

DISCUSSION

An unexpected finding was the differences between the control and toolkit education intervention groups' ethnicity. Students self-enrolled in course sections, and in terms of group composition, Asian students were concentrated in the control group, with black and white students making up twice the proportion of the intervention group when compared with the control group.

Students were asked their age; however, 25% did not provide a usable response, so age could not be used in the analysis. Percentage of the entire senior nursing student body older than 30 years is approximately 53%, higher than National League of Nursing 2014 statistics of 42% for associate degree programs compared with 18% for baccalaureate degree programs.[41]

Table 2 summarizes breastfeeding experience and attitudes of the control and intervention groups. The control group had more personal experiences and more positive experiences with breastfeeding. A positive finding was that the vast majority of students would recommend breastfeeding before and after the education.

When comparing mean test scores of the control and intervention groups, neither the pretest nor the posttest scores were significantly different between groups. However, the average improvement from pre- to posttest was significantly different. While both groups showed significant average improvement from pre- to posttests, the intervention group showed significantly more growth than the control group.

Considering the percentage of students with personal or partner experience with breastfeeding, researchers were led to compare mean correct items of students with experience versus students with no experience. Mean pretest and posttest scores were significantly higher among students with experience in the control group, but not in the intervention group. Interestingly, within the whole sample, mean change in correct items was lowest in students with breastfeeding experience, which may suggest that students rely on experience versus evidence, and that breastfeeding education requires an emphasis on evidence-based practice while acknowledging the value of the lived experience.

Similar to findings from previous studies, student learning about breastfeeding was evident from pretest to posttest scores overall; however, posttest scores remained low.[30,42] A score of 80% on assessments is deemed a passing score for the nursing program for this study. Posttest scores were highest on items about anatomy and physiology of lactation science, and lowest on breastfeeding support skills. While a 25-minute session for demonstration and role-play was provided, more planned opportunities for skill competency either in the clinical setting or simulation laboratory may

Table 3. **Percentages of control, intervention, and total groups that responded correctly to each item**

	Pretest			Posttest		
Items with correct response	**Control, %**	**Intervention, %**	**Total, %**	**Control, %**	**Intervention, %**	**Total, %**
1. Mothers should be helped to initiate breastfeeding within 1 h of birth. (*True*)	91	88	89	94	100	97
2. Either the infant or a breast pump must remove milk from the breast to establish and maintain milk production. (*True*)	93	82	87	96	95	96
3. About 25% of women are incapable of breastfeeding. (*False*)	9	17	13	35	35	35
4. In most cases, breastfeeding must end if a mother requires a prescription medication. (*False*)	48	43	46	72	77	75
5. Supplemental feeding with formula can be detrimental to the establishment of good milk supply. (*True*)	39	48	44	54	72	63
6. Mothers intending to breastfeed should expect their nipples to be sore during and between feedings. (*False*)	35	22	28	67	58	62
7. Mothers know instinctively how to breastfeed. (*False*)	80	78	79	74	82	78
8. One stool diaper in a 24-h period is a sign of adequate intake in a breastfed newborn at 1 wk of age. (*False*)	65	35	49	70	75	73
9. The American Academy of Pediatrics recommends that babies are breastfed for at least 1 yr. (*True*)	67	68	68	72	73	73
10. An infant's cry is often the first sign that he or she is ready to breastfeed. (*False*)	39	25	32	44	38	41
11. A breastfed newborn should nurse every 4 h. (*False*)	39	32	35	72	72	72
12. A mother may continue breastfeeding if she develops mastitis (inflammation of the breast tissue). (*True*)	39	33	36	93	92	93

Table 4. **Mean items correct and mean change in items correct**

	Pretest			Posttest		
	Control	Intervention	Total	Control	Intervention	Total
Mean number of items correct	6.43	5.72	6.05	8.44	8.68	8.57
Mean change in items correct				2.02	2.97	2.52

better enhance learning regarding breastfeeding support skills.

A concerning finding was the volume of incorrect responses to item 3 "About 25% of women are incapable of breastfeeding." Approximately half (56 of 114) the students responded "unsure" and only one-quarter responded correctly on the pretest. Just over one-third from the control and intervention groups responded correctly on the posttest. The responses may suggest a prevailing perception that there is an uncertainty of women's ability to breastfeed and that education should clearly address that the vast majority of women can breastfeed with the understanding that support by health professionals is essential.

Since the case study was not made a requirement by every course faculty member, one-third (21/60) of the students in the intervention group did not complete the case study. Poststudy surveys of faculty and students would be helpful to identify how to support full implementation.

Students come to nursing programs with different levels of knowledge about breastfeeding. Nearly half of the students participating in this study had personal or partner experience with breastfeeding. The pilot study created a greater awareness of the importance of breastfeeding content in the curriculum and stimulated discussion among the maternal-newborn faculty about course and clinical content, and student learning activities about breastfeeding.

The toolkit provides both theory and skills learning activities, which can be used in a variety of clinical settings. In addition to nursing curriculum, the education with minor revisions could be adapted for use in ambulatory and acute care settings with new nurses, as well as with nurses and health professionals of varying disciplines, years of experience, and education.

The study emphasis was to provide motivation for all nurses to have breastfeeding support information in their basic nursing education; therefore, the population of the study was nursing students. The overall goal is to prepare all nursing students in their prelicensure nursing education to have the ability to provide evidence-based lactation education for basic breastfeeding support. While perinatal and neonatal nurses working with childbearing families will be using this education daily, basic breastfeeding knowledge is imperative. For example, if a mother who is breastfeeding is admitted to a medical-surgical or intensive care unit, the nurse would know to assist her to maintain lactation.

Table 5. **Linear regression results, single variable**

	Coefficient	Confidence Interval	Standard Error
Model 1: Results of a linear regression predicting posttest score			
Control group (omitted)			
Intervention group	0.26	−0.36 to 0.87	0.31
Constant	7.59[a]	7.14 to 8.04	0.23
$R^2 = 0.006$			
Model 2: Results of a linear regression predicting posttest score			
Pretest score	0.38[a]	0.24 to 0.51	0.07
Constant	5.44[a]	4.60 to 6.28	0.42
$R^2 = 0.22$			
Model 3: Results of a linear regression predicting posttest score			
Control group (omitted)			
Intervention group	0.51	−0.04 to 1.06	0.28
Pretest score	0.39[a]	0.26 to 0.52	0.07
Constant	5.06[a]	4.13 to 5.99	0.47
$R^2 = 0.25$			

[a] $P < .001$.

Revisions to increase clarity of the evidence-based materials are ongoing. Examples include an update to the case study content aimed at dispelling the misperception of women's inability to breastfeed and emphasizing the use of evidence-based practice to facilitate breastfeeding support. More time provided for support skills competencies is being evaluated. The skills activities have been added to the maternal-newborn course clinical orientation instead of the classroom setting, thus allowing additional time for practice.

Limitations

Breastfeeding knowledge was evaluated from a single sample of associate degree nursing students from 1 US college. A larger sample with students from more than 1 college, inclusive of undergraduate university settings from different geographical regions, could provide evidence to support the use of the toolkit education as an effective learning tool. Another limitation was the inability to control for variables, like the differences in composition of the control and intervention groups due to student self-registration, the definition of "standard" breastfeeding education, student receptiveness to breastfeeding education, and completion of toolkit assignments. Course grades were not linked to the assignments related to the toolkit education, which consisted of 2 hours of self-directed study. Perhaps as a result, one-third of the students did not complete the online case study. The study was performed in an academic setting; implementation and evaluation of the toolkit in clinical settings are warranted.

CONCLUSION

The evidence suggests that, without adequate support and counseling, women do not initiate breastfeeding or they discontinue soon thereafter.[2] Lack of support by healthcare professionals is a barrier to successful breastfeeding.[2,6,10] Studies have shown that basic nursing education does not adequately prepare students to assist breastfeeding families.[23,28] Making breastfeeding education a *core element* in nursing and professional health education is essential for changing these current realities.[6] The evidence is clear that exclusive breastfeeding is preventive for many chronic illnesses and provides health benefits that last a lifetime.[5] Nurses must be comfortable with and conversant in breastfeeding best practices. Comprehensive education in nursing programs will provide future nurses with the foundation needed to provide quality breastfeeding support. However, nurse educators are challenged to facilitate student learning about breastfeeding in shortened time frames in an already overburdened curriculum. Absent a clear consensus in the literature supporting a specific curriculum for facilitating learning about breastfeeding, this toolkit of evidence-based breastfeeding materials was developed to provide a curriculum for nursing students that demonstrated learning about breastfeeding in a limited time frame. Until evidence-based breastfeeding curriculum is standard in healthcare educational programs, new graduates as well as seasoned clinicians can benefit from this toolkit. Further implementation and evaluation in these settings are warranted.

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