ISSN: 2578-3335 (Print) 2578-3343 (Online)

Volume 3 | Issue 1 Article 3

2021

Knowledge, Attitudes, and Barriers to Breastfeeding in Adolescent Mothers: a Review

Kimberly Kullmann, MPH
Cooper Medical School of Rowan University, kullma63@rowan.edu

Amy Leader, DrPH, MPH
Thomas Jefferson University, amy.leader@jefferson.edu

Rosemary Frasso, PhD, MSc, MSc, CPH
Thomas Jefferson University, rosie.frasso@jefferson.edu

Cooper Rowan Medical Journal: https://rdw.rowan.edu/crjcsm

Recommended Citation

Kullmann, MPH, Kimberly; Leader, DrPH, MPH, Amy; and Frasso, PhD, MSc, MSc, CPH, Rosemary (2021) "Knowledge, Attitudes, and Barriers to Breastfeeding in Adolescent Mothers: a Review," *Cooper Rowan Medical Journal*: Vol. 3: Iss. 1, Article 3.
DOI: 10.31986/issn.2578-3343_vol2iss1.8
Available at: https://rdw.rowan.edu/crjcsm/vol3/iss1/3

Knowledge, Attitudes, and Barriers to Breastfeeding in Adolescent Mothers: a Review

Knowledge, Attitudes, and Barriers to Breastfeeding in Adolescent Mothers: a Review

Kimberly Kullmann, MPH[1]*, Amy Leader, DrPH, MPH[2] & Rosemary Frasso, PhD, MSc, MSc, CPH[3]

[1]Student Doctor, Cooper Medical School of Rowan University, 401 Broadway, CAMDEN, 08103, NJ, United States

[2]Medical Oncology, Thomas Jefferson University, Philadelphia, PA

[3]Public Health, Thomas Jefferson University, Philadelphia, PA

*Corresponding author: kullma63@rowan.edu (Kimberly Kullmann, MPH)

ABSTRACT

Introduction: Despite the proven benefits of breastfeeding, there are a variety of reasons why many women do not, or cannot, breastfeed their children. Adolescent mothers are even less likely to breastfeed than non-adolescent mothers. The aim of this review was to synthesize the current literature on breastfeeding practices in adolescent mothers and explore the factors influencing their breastfeeding decisions.

Methods: A literature search was conducted in January 2018 using PubMed. Studies were included in the review if they discussed adolescent mothers' views and experiences of breastfeeding or if they reporting breastfeeding rates among adolescent mothers. For this review, adolescence was defined as the ages between 13 and 21.

Results: Of the 19 studies selected, each study was summarized and analyzed to determine that the proportion of adolescent mothers who breastfeed is lower than non-adolescent mothers: 31-100% initiated breastfeeding, 17-64% breastfed exclusively, and more than half stopped within the first month. Intention to breastfeed, social support and maternity care support were positive predictors of breastfeeding behaviors. Although significant effects of the interventions aimed at improving breastfeeding rates was revealed by this review, findings also indicated analytical themes related to adolescents' breastfeeding knowledge, attitudes, and barriers that are unique to their age group.

Conclusions: This review highlights that adolescents have limited breastfeeding knowledge, unique attitudes, and face a variety of barriers to breastfeeding, including returning to school, social stigma, the physical demands of breastfeeding and unease with the act of breastfeeding. These findings indicate that

developmentally sensitive education and support is fundamental to effective interventions aimed to increase breastfeeding rates among adolescent mothers.
Keywords: Breastfeeding, adolescent mothers, teenage mothers, infant feeding

INTRODUCTION

The benefits of breastfeeding to women and their children are well-documented in the literature. For the mother, breastfeeding releases the hormones prolactin and oxytocin, which promote warmth and closeness with their child.[1] Ultimately, the physical and emotional experience of breastfeeding creates a special bond and maternal fulfillment. Breastfeeding also lowers a mother's risk of heart disease, type 2 diabetes, ovarian cancer, and breast cancer.[2] For the infant, breastmilk provides essential immunologic and developmental advantages.[3] It has also been shown to reduce the risk of asthma, obesity, type 2 diabetes, sudden infant death syndrome (SIDS), and ear and respiratory infections.[2] Breastmilk provides the optimal nutrition for a mother's newborn child and the American Academy of Pediatrics (AAP) recommends exclusive breastfeeding for the first six months of a child's life.[4] Research found that 90% compliance with the AAP's recommendation for exclusive breastfeeding through six months could prevent 850 infant deaths and save $13 million each year.[5] Despite the proven immunological, nutritional, psychosocial, and economic benefits of breastfeeding, many women do not breastfeed their children.

There are many factors that influence a woman's decision to breastfeed and these factors are multifaceted. Research shows that a woman's intention to breastfeed is a key predictor of breastfeeding initiation.[6] Additionally, knowledge, attitudes, and social support also impact a woman's decision to initiate and continue breastfeeding. Barriers to breastfeeding include health literacy, confidence, stigma, social norms, lactation problems, lack of prenatal care, and returning to work or school.[7] Moreover, rates of breastfeeding vary across the United States and disparities persist among certain subgroups. Rural areas have lower rates of breastfeeding compared with urban areas and African American mothers are less likely to breastfeed than non-Hispanic white and Hispanic mothers.[2] In addition to race, education, and socioeconomic status, age is also a risk factor. Accordingly, teen mothers have lower rates of breastfeeding initiation, exclusivity, and duration compared to adult mothers.[3]

In the United States, 229,715 women ages 15-19 years gave birth in 2015, which is approximately 22.3 births per 1,000 population.[8] Promoting breastfeeding in this vulnerable population is particularly important as adolescent mothers comprise a significant proportion of new mothers each year. The United States continues to have the highest rate of teen pregnancy in the industrialized world yet, adolescent mothers are less likely to breastfeed compared to any other population group in the United States.[9] Among women younger than 20 years, less than 60% of infants were ever breastfed, and only 17.4% of infants are

breastfed at 6 months.[2] These rates are significantly lower compared to adult mothers.[2] The Centers for Disease Control and Prevention (CDC) estimates over $3 billion each year in medical costs as a result of the low rates of breastfeeding in the United States.[2] Evidently, the low rates of adolescent breastfeeding initiation, exclusivity, and duration is a critical public health concern that demands action.

Traditional efforts to increase breastfeeding rates may not adequately target vulnerable populations and limited data is available for interventions specifically intended for adolescents.[5] Among other barriers in improving the rate of adolescent breastfeeding, there is bias among health care practitioners that may lead to less support. Clearly, this vulnerable population requires additional efforts to promote breastfeeding. Therefore, it is necessary to examine adolescents' knowledge, attitudes, intentions, support systems, and barriers to breastfeeding, to better understand this disparity and provide best practices to increase breastfeeding rates among adolescent mothers. The purpose of this research was to review and synthesize the current peer-reviewed literature on breastfeeding practices in adolescent mothers. This research will add to existing reviews on breastfeeding intentions and behaviors among adolescents and ultimately, provide future directions for targeted public health interventions.

METHODS

Identification of Studies

A review of peer-reviewed research was performed to synthesize the current literature on adolescent breastfeeding practices and explore the factors influencing adolescents' decision to initiate and continue breastfeeding. This review was modeled after the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. First, a structured search was conducted on the PubMed online database in January 2018. Search methodology combined the following search terms: "Adolescent mothers" or "Teenage mothers" and "Breastfeeding." Accordingly, our database search result identified 112 PubMed articles.

Selection of Studies

Eligible published manuscripts met the following criteria: articles were published in English between 2007 and 2017, studies were conducted in either the United States or Canada, studies included were of qualitative, quantitative, descriptive and mixed-methods designs, participants included adolescent mothers between the ages of 13 and 21, and the primary outcome was breastfeeding. Of the 112 articles initially identified, 74 articles met the inclusion criteria of being published in the English language between 2007 and 2017. Articles prior to 2007 were not included in this review as adolescents' knowledge, attitudes, and behaviors change over time. Thus, only articles from the last decade were included in this review. Results were further limited to exclude reviews. Articles were thoroughly screened by the primary investigator

using the inclusion and exclusion criteria by first reading the abstract, followed by more in-depth evaluations as needed. Notably, this database search revealed a review by Kanhadilok and McGrath,[4] which is a similar review on the current state of the science published on this topic in 2015. Subsequently, the 22 articles from this review were also screened for inclusion and despite 5 duplicates, 17 articles supplemented the database search.

During the initial selection process, the number of articles reviewed was first decreased to 36. Full-text articles were then retrieved and reviewed for inclusion. After further analysis, 19 articles met the selection criteria from the 129 articles initially identified. Of the 17 full-text articles excluded, 9 were reviews, 3 were not conducted in either the United States or Canada, and 5 failed to provide sufficient information regarding the knowledge, attitudes, and/or barriers to adolescent breastfeeding. As a result, 19 peer-reviewed research articles were used in this review. A diagram of the search strategy is provided in Figure 1.

Data Extraction and Analysis

The primary investigator extracted the data and evaluated the methodological quality of each study and the credibility of the results. Independent extraction was performed by the author and the following information was extracted: year of publication, country where study was conducted, year(s) of data collection, study design, sample size, age range, participant characteristics (race/ethnicity, income level, education level, marital status, parity, etc.), method of data collection, outcome measures, and study findings.Extracted data was entered in RevMan (Review Manager) software. The scientific quality was also examined independently by the author. In this quality assessment, a general appraisal of the study quality was performed. It examined the study population, selection process and attention to selection bias, loss to follow-up and attrition bias, and adjustment for confounding factors. After a thorough assessment of bias risk in the included studies, none of the studies were excluded from this review on the basis of the quality appraisal.

Next, this research used the findings of each study and the primary data therein to produce a synthesis of adolescent mothers' views and experiences of breastfeeding. This review represents a qualitative synthesis of the current state of the science. The 19 studies included in this review were categorized according to factors presented in the studies. These factors include reported association between breastfeeding knowledge, attitudes, intentions, perceived benefits, social support, barriers, maternity care support, as well as breastfeeding initiation, exclusivity, and duration. The result with summary measures and information about the included studies can be found in Table 1.

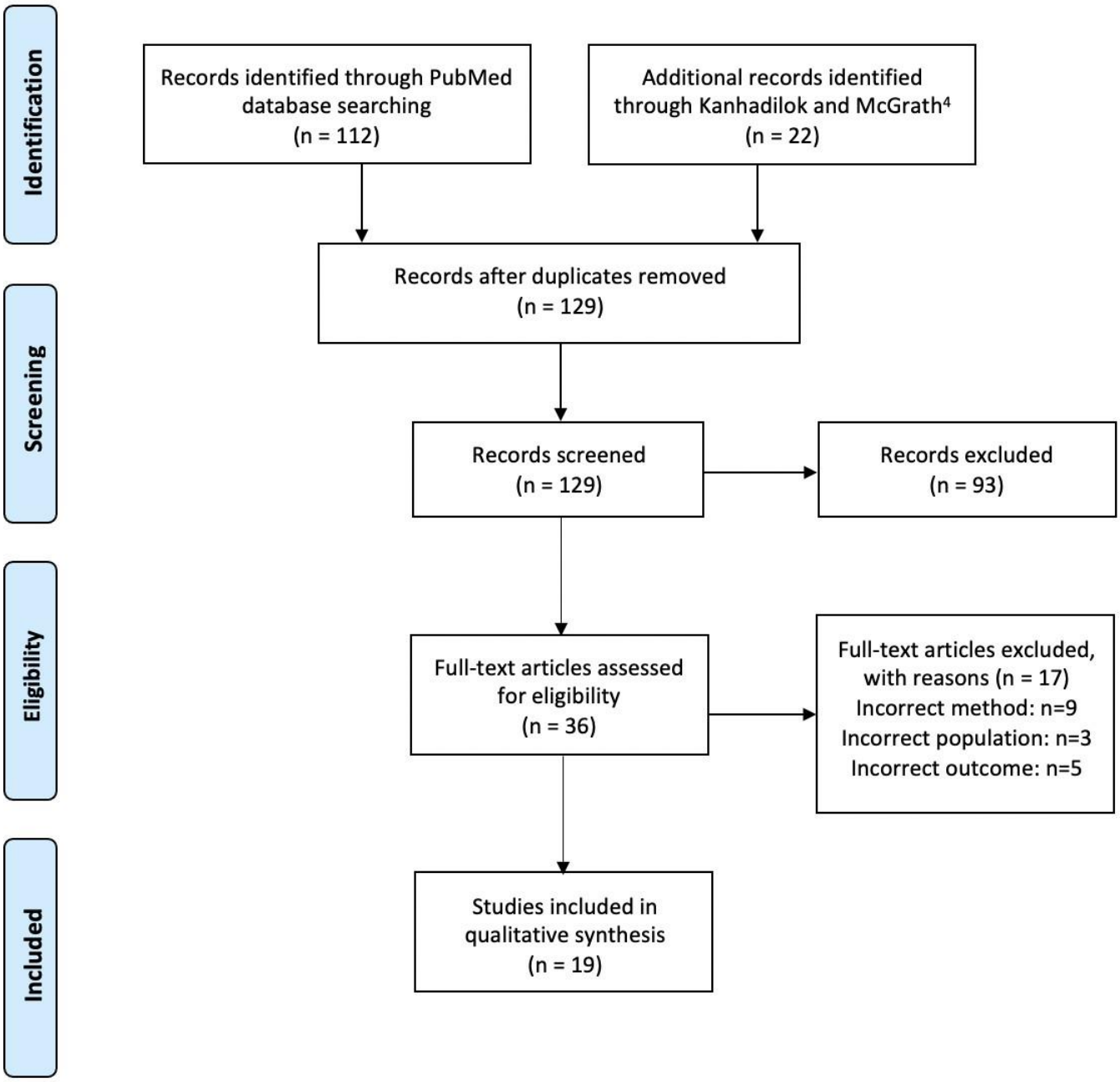

Figure 1 PRISMA flow diagram

RESULTS

Study Characteristics

Individual sample sizes ranged from 5 to 288,242 mothers. The maternal age in the included studies was between 13 and 41 years, as two studies[11,12] included both teens and non-teens. Adolescent mothers are defined as younger than 20 years however, three studies[7,13,14] classified adolescent mothers as through 21 years. Furthermore, six studies[10,11,14–17] enrolled pregnant adolescents and one study[18] enrolled pregnant adolescents in addition to adolescent mothers postpartum. Six studies[10,15,17,19–21] were breastfeeding interventions and three studies[16,21,22] purposefully enrolled mothers who intended to breastfeed. Participants

were generally single, primiparous, low-income, and minority teens (largely African American). The majority of the included studies were conducted in the United States, except for three studies [6,16,23] conducted in Canada.

Breastfeeding Initiation, Duration and Exclusivity

Of the included research articles, three studies[11,12,22] compared breastfeeding intentions and initiation between adolescent and adult women. Alexander et al[11] found no significant difference between teens' and non-teens' intention to breastfeed, yet, Apostolakis-Kyrus et al[12] found that adolescents were 33% less likely to breastfeed compared to adult women after adjusting for important risk factors (RR = 0.77, 95% CI [0.75-0.80]). Likewise, Olaiya et al[22] found that the prevalence of any breastfeeding through 8 weeks postpartum was 40% lower among adolescent mothers compared to participants aged 20 years and older. Among the intervention studies,[15,17,19] breastfeeding rates were as high as 91% to 100%, and breastfeeding duration was extended between 177 days to 6 months. In comparison, qualitative studies [6,7,10,14,16,17,24,25] reported adolescent breastfeeding initiation rates of 31% to 100% and exclusive breastfeeding rates from 17% to 64%. The duration of breastfeeding varied from 1 to 6 months and more than half of adolescent mothers who initiated breastfeeding stopped within the first month.

Olaiya et al[22] found that 64.4% of adolescent mothers breastfed to 4 weeks postpartum and 40.9% breastfed exclusively. In comparison, Mossman et al[16] found that 46% breastfeed to 4 weeks postpartum and Tucker et al[25] found that only 28% breastfed to 4 weeks postpartum. Similarly, Glass et al[24] found that only 22% of those who initiated breastfeeding continued until 6 weeks postpartum. Sipsma et al[14] found that only 11% breastfed through 6 months postpartum and Woods et al[7] found that less than 7% breastfed longer than 1 month.

Furthermore, numerous studies reported a relationship between breastfeeding intentions and breastfeeding initiation, duration, and exclusivity. More specifically, adolescent mothers' intention to breastfeed was significantly associated with breastfeeding initiation, a longer duration, and exclusive breastfeeding at hospital discharge.[6,14,16,17,26] According to Sipsma et al,[14] adolescents who intended to breastfeed were 23 times more likely to initiate breastfeeding than those who did not intend to breastfeed (OR = 22.84, 95% CI [9.07-57.53]). Yet, Alexander et al[11] reported significantly fewer teens than non-teens had considered infant feeding methods prior to becoming pregnant. In addition, adolescent mothers reported making the decision whether or not to initiate breastfeeding during the prenatal period.[15,23] They typically made this decision independently, though opinions of family members and partners were influential.[23] Evidently, prenatal intentions to breastfeed are fundamental to postpartum breastfeeding behaviors.

Knowledge, Attitudes and Barriers

Findings from this review offered evidence of influencing factors significantly related to adolescent

breastfeeding practices, i.e., breastfeeding initiation, continuation, and exclusivity. These factors were characterized as knowledge, attitudes, and barriers to breastfeeding. The following sections provide evidence of how these factors are associated with breastfeeding practices among adolescent mothers.

Knowledge. Notably, the majority of included studies found that adolescent mothers' main reason for breastfeeding was for the health of their infant.[26] Several studies highlighted the notion among adolescent mothers that "breast is best," or said another way, that breast milk is healthier than formula and breastfeeding is best for the health of their baby.[10,11,18,23,25,26] Wambach and Cohen[26] also found that adolescent mothers described infant health benefits as less infant sickness and less obesity in breastfed children. Though infant health benefits were overwhelmingly cited as the primary reason given for choosing to breastfeed, other reasons were also given as motivating factors. The second most frequent reason was related to infant bonding and the closeness conferred between mother and baby.[23,26] Additionally, economic benefits such that "it's cheaper" and the ease and convenience of breastfeeding, specifically nighttime feedings, were also identified as key reasons teens chose to breastfeed.[10,23,26] However, despite the common belief among teens that breastfeeding is healthier, studies found that teens lack specific knowledge about breastfeeding.[10,18] "Adolescent mothers lacked knowledge about breastfeeding norms and practices such as how frequently babies feed and how to know if the baby was getting enough breastmilk."[23] Moreover, Alexander et al[11] found that though both teens and non-teens stated that the benefits of breastfeeding were explained to them, significantly more non-teens said they knew "pretty much" or "a lot" about breastfeeding. This suggests that teens' knowledge of breastfeeding may be more limited compared to older women. Interestingly, Brown et al[19] found that adolescent mothers had difficulty finding reliable breastfeeding information on the internet; "…because of all the information that is available online, sorting out misinformation from reality can be complicated." Nevertheless, research shows that breastfeeding knowledge is significantly associated with breastfeeding initiation.[17] Thus, numerous research studies have explored interventions to improve breastfeeding knowledge among adolescent mothers.[17,20] Logsdon et al[20] implemented an educational intervention targeting adolescent mothers and utilized simple, written educational pamphlets. This research found that although participants found the educational materials to be acceptable and the intervention was initially effective in improving knowledge scores, knowledge was not retained.[20] Lastly, this study also found that adolescent mothers' health literacy was poor.[20]

Attitudes. Adolescents have specific attitudes regarding breastfeeding due to their unique age and situation. Research by Nelson[18] investigated adolescents' attitudes towards breastfeeding and reported a widespread agreement concerning women's "right" to breastfeed if they choose. This research also highlighted the belief that, "breastfeeding is the mother's choice" and "the baby comes first.[18] Attitudes

towards breastfeeding were largely formed prenatally and determined breastfeeding initiation. According to Mossman et al,[16] higher prenatal attitude scores were significantly associated with breastfeeding initiation and duration. Similarly, breastfeeding self-efficacy, as measured by a scoring system established by Dennis,[27] is related to breastfeeding initiation and continuation.

This review identified attitudes unique to adolescent mothers. Compared to non-teens, significantly more teens did not consider it "okay" to breastfeed in public.[11] Interestingly, Tucker et al[25] found a general impression among teens that breastfeeding was uncommon. Research also showed that breastfeeding was more difficult than teens had expected or could manage, and they quickly felt overwhelmed.[10,23]

Furthermore, attitudes about breastfeeding were also related to social support. Mossman et al[16] found that significantly more adolescent mothers who initiated breastfeeding were also breastfed as infants; "it is likely that these mothers received greater support, encouragement, and more positive feedback from their own mothers about the benefits of breastfeeding." According to Woods et al,[7] teens reported a history of negative attitudes regarding breastfeeding from important social supports in their lives. For example, teens mentioned that their own mother did not support breastfeeding or that other mothers they knew bottle-fed their babies and they were "fine."[7] Finally, multiple studies have shown that having a supportive partner is positively correlated with breastfeeding initiation.[14,16] Clearly, breastfeeding support is essential for the adolescent, particularly in terms of emotional support.[23]

Barriers . Adolescents face innumerable barriers to breastfeeding and consequently, these barriers are the most likely contributors to their low rates of breastfeeding initiation, duration, and exclusivity. Nearly all of the included studies mentioned at least one barrier to adolescent breastfeeding, most notably the physical demands of breastfeeding followed by the unease with the act of breastfeeding. These barriers included physical discomfort, pain, nipple soreness, breast/nipple problems, difficulty latching on, low milk supply, or concern about insufficient milk.[7,10,14,15,18,24–26] "A lack of confidence in their ability to breastfeed and reticence to ask for help may be other barriers that pertain especially to teens."[25] Another major barrier to breastfeeding for adolescent mothers is a lack of support from family and primary care providers.[7,23] Smith et al[10] also identified the inadequate healthcare response as a barrier. Lack of physician education and maternity care practices that support breastfeeding are barriers among adolescents.[22] Olaiya et al[22] found that merely 7% of adolescent mothers reported experiencing all five of the maternity care practices that are related to breastfeeding outcomes (breastfeeding in the first hour after delivery, feeding the infant only breast milk at the hospital, hospital staff encouragement to breastfeed the infant on demand, not using a pacifier in the hospital, and not receiving a hospital gift pack that contained formula).

Furthermore, qualitative reports highlighted privacy concerns, social stigma, and embarrassment about

nursing in public as barriers to breastfeeding for adolescent mothers.[7,18,23,25,26] Nesbitt et al[23] discussed the additional stigma associated with being a "teen mom," which further complicates the breastfeeding experience. Barriers to adolescent breastfeeding also concerned lifestyle, independence, and navigating multiple roles including, returning to school/work, school/work separation, wanting to be able to leave the baby for several hours at a time, and thinking it would be inconvenient.[7,10,14,18,25,26] Finally, the impact of breastfeeding on social and intimate relationships was also described as a barrier.[23]

Table 1 Studies related to breastfeeding in adolescent mothers

Study	Design	Breastfeeding Practices	Influencing Factors
Alexander et al., 2010	Prospective cross-sectional study	63% of teens intended to breastfeed. Breastfeeding intentions and planned duration and exclusivity are not significantly different between teens and non-teens.	Positive factors: primiparity, good self-assessed knowledge about breastfeeding, and support of the father of the baby. Attitudes: significantly more teens than non-teens did not consider it okay to breastfeed in public.
Apostolakis-Kyrus et al., 2013	Retrospective population-based cohort study	44% of adolescent mothers initiated breastfeeding compared with 65% of older mothers ($p < .001$).	Positive factors: socioeconomic factors and social support. Barriers: maternal perception, societal barriers, and a lack of prenatal intervention.
Brown et al., 2014	Qualitative descriptive study	100% of sample breastfed through 6 months postpartum.	Health promotion text blasts helped improve breastfeeding duration in adolescent mothers. Themes: trustworthy support system, overcoming barriers to health promotion, parenting validation, and preferred mode of communication.
Cota-Robles et al., 2017	Qualitative study	91.1% of the sample initiated breastfeeding, of which 6.4% breastfed at 6 months postpartum.	Negative factors: not having enough milk, the baby having trouble sucking or latching on, breastfeeding being too painful, and not being able to or not wanting to pump breastmilk.
Glass et al., 2010	Retrospective chart review	At hospital discharge, 59.3% initiated breastfeeding, of which 22.2% breastfed at 6 weeks postpartum.	Positive factors: primiparity. Barriers: limited knowledge of breastfeeding basics, uneasiness with the act of breastfeeding, sore nipples, inadequate milk supply, and the perception that the newborn was not receiving enough breast milk.
Leclair et al., 2015	Retrospective population-based cohort study	At hospital discharge, 48.8% breastfed exclusively.	Positive factors: intention to breastfeed, prenatal class attendance, living in a higher-income neighborhood, having a spontaneous vaginal delivery, being a nonsmoker, not using substances

			during pregnancy, and not having any preexisting health problems or obstetrical complications ($p < .0001$).
Logsdon et al., 2015	Prospective quasi-experimental study		Adolescent mothers found the educational intervention to be acceptable and the intervention was initially effective in improving knowledge scores however, knowledge was not retained. Adolescent mothers' health literacy was poor.
Meglio et al., 2010	Randomized controlled trial	At hospital discharge, 29.5% breastfed exclusively, yet 70.5% intended to breastfeed.	Peer support was clearly significant for duration of exclusive breastfeeding in adolescent mothers.
Mossman et al., 2008	Prospective correlational study	84% of the sample initiated breastfeeding, of which 46% breastfed at 4 weeks postpartum.	Prenatal attitude was a predictor of mothers who initiated breastfeeding. Postpartum confidence was important to continue breastfeeding to 4 weeks postpartum.
Nelson, 2009	Qualitative study	Of the 8 pregnant participants, 87.5% intended to breastfeed. Of the 8 postpartum participants, 62.5% initiated breastfeeding.	Beliefs: breastfeeding helped a new mother lose her body weight and increased sense of infant bonding. Attitudes: breastfeeding is the mother's choice and the baby comes first. Concerns: discomfort of breastfeeding, privacy, and infant's dependence on mother. Negative factors: pain was a major factor for discontinuing breastfeeding.
Nesbitt et al., 2012	Qualitative study		Themes: impact of breastfeeding on social and intimate relationships, availability of social support, physical demands of breastfeeding, mothers' knowledge of breastfeeding practices and benefits, and mothers' perceived sense of comfort in breastfeeding.

Olaiya et al., 2016	Cross-sectional study	64.4% of the sample breastfed through 4 weeks and 40.9% breastfed exclusively. 44.6% of the sample breastfed through 8 weeks and 30.9% breastfed exclusively. 7% of adolescent mothers reported experiencing all five of the practices that are related to breastfeeding outcomes and 9.6% reported not experiencing any of the five practices.	Five maternity care practices significantly associated with breastfeeding outcomes: breastfeeding in the first hour after delivery, feeding the infant only breast milk at the hospital, hospital staff encouragement to breastfeed the infant on demand, not using a pacifier in the hospital, and not receiving a hospital gift pack that contained formula. Significant dose-response relationship between the number of maternity care practices experienced by adolescent mothers and their breastfeeding outcomes.
Pentecost & Grassley, 2014	Secondary qualitative content analysis		Adolescents need a combination of informational, institutional, emotional, and appraisal support. Positive factors: nurses who take the time to talk with them about breastfeeding and help them effectively position and latch their infants.
Sipsma et al., 2013	Prospective longitudinal cohort study	During pregnancy, 75% reported intending to breastfeed, of which 71% initiated breastfeeding and 46% breastfed exclusively. Average breastfeeding duration was 5 weeks and 11% breastfed through 6 months postpartum.	Intention to breastfeed was significantly associated with breastfeeding initiation ($p < .01$). Breastfeeding duration was positively associated with exclusive breastfeeding and attending childbirth classes.
Smith et al., 2012	Qualitative prospective cohort study	100% of the sample initiated breastfeeding; 4 of the 5 teenagers breastfed for 9 days and 1 teenager breastfed exclusively for 6 months.	Themes: breastfeeding intentions and practice, mixed breastfeeding messages and support, poor breastfeeding knowledge and skills, uncontrollable and unpleasant physical experience with breastfeeding, inadequate health care response, and breastfeeding cessation.

			Positive factors: support from school, belief that "breast is best" and "it's cheaper." Barriers: stigma and embarrassment related to being a teen mother, lack of parenting readiness, need for peer acceptance, and dependence on social support systems that may not be supportive of breastfeeding.
Tucker et al., 2011	Mixed methods study	52% of the sample initiated breastfeeding, of which only 17% breastfed exclusively and 28% breastfed through 4 weeks postpartum.	Positive factors: professional support during pregnancy and encouragement from family were important to breastfeeding initiation. Barriers: pain, perceptions of difficulties of breastfeeding such as difficulty latching on and insufficient breastmilk.
Wambach et al., 2011	Randomized controlled trial	69% of the sample initiated breastfeeding, of which only 44.6% breastfed exclusively.	Breastfeeding knowledge, prenatal intention, and social and professional support positively influenced breastfeeding duration.
Wambach & Cohen, 2009	Qualitative descriptive study	56% of the sample initiated breastfeeding, of which only 17% breastfed exclusively.	Breastfeeding initiation was influenced by perceived benefit to infant's health and experiences during hospitalization. Positive factors: bond and closeness. Negative factors: insufficient milk supply and perceived lack of family support.
Woods et al., 2013	Qualitative study	At hospital discharge, 69.5% initiated breastfeeding, of which 64% breastfed exclusively and less than 7% breastfed longer than 1 month.	Themes: behavioral histories of breastfeeding (attitudes), community assets (local hospitals and social services), social support, and barriers. Barriers: lack of support from family and primary care providers, social stigma/ embarrassment, and difficulty with breastfeeding techniques.

DISCUSSION

The current review demonstrated that the proportion of adolescent mothers who breastfeed is disproportionately lower than adult mothers. Study findings indicate that breastfeeding knowledge, attitudes, and barriers play an important role in adolescents' breastfeeding practices. Other studies have found similar results linking these factors to breastfeeding rates among adolescent mothers. Notably, Kanhadilok and McGrath[4] categorized significant breastfeeding findings by the following factors, attitude and perception of breastfeeding, perceived support of breastfeeding, concerns related to public exposure and privacy, and breastfeeding knowledge. Apostolakis-Kyrus et al[12] suggested that the most likely contributors to this outcome in adolescent mothers are maternal perception, societal barriers, and lack of prenatal information. Ultimately, the findings from this review expand previous research investigating reasons that influence adolescent mothers' breastfeeding practices.

We found an association between adolescent mothers' prenatal intention to breastfeed and breastfeeding initiation and duration. However, adolescents are less likely than adults to have thought about infant feeding methods prior to becoming pregnant.[11] Hence, breastfeeding intention could provide a potential intervention opportunity. "Motivational interviewing is a promising prenatal strategy to influence behavior change and reduce ambivalence in decision-making about breastfeeding, creating opportunities for health care providers to tailor interventions."[23] Additionally, positive support from peers, family members and partners was also a recurring influential factor to adolescent breastfeeding practices. Though adolescents claim to make the decision to breastfeed individually, social support was found to be instrumental. Thus, efforts to improve the public perception of breastfeeding is also needed.

Despite a widespread understanding among adolescent mothers that "breast is best," or that breastfeeding is healthier, this review showed that the majority of adolescent mothers have poor breastfeeding knowledge and skills. Several studies suggest that the support of nurses and lactation specialists in the hospital after delivery can help to encourage breastfeeding initiation. Apparently, adolescents found breastfeeding more complicated than they had expected and were quickly overwhelmed.[10] Teens may also benefit from informational and instrumental support from healthcare professionals as research also highlighted the importance of an early positive breastfeeding experience. However, many social support interventions, such as peer and professional support, have yet to significantly increase adolescent breastfeeding rates in the United States.

From this review of the peer-reviewed literature on adolescent breastfeeding, it is evident that adolescent mothers face a variety of challenges that are unique to their age group. The low rate of maternity care practices experienced by adolescents[22] may indicate implicit bias among health care staff in supporting the adolescent mother to initiate breastfeeding. This would be a significant barrier to their success. Unique

barriers to adolescent breastfeeding included returning to school, stigma and embarrassment related to being a teen mother and/or breastfeeding in public, as well as the need for peer acceptance and lack of parenting readiness.[10] As a result, findings from this review support interventions that acknowledge the developmental characteristics of adolescents.[26] Specifically, developmentally sensitive education and support is fundamental to effective interventions aimed to increase breastfeeding rates among adolescent mothers.

LIMITATIONS

There are limitations to this review. PubMed was the only scholarly database searched and independent extraction and data analysis was performed solely by the primary investigator. The use of additional databases, such as Google Scholar, CINAHL, etc., could have strengthened this study design. There was also limited attention on intervention studies that facilitate initiation and duration of breastfeeding among adolescents. Even though these programs as described in the literature may be resource dependent, they may provide models for community involvement to overcome the barriers summarized in this review.

All studies included in this review were conducted in the United States with the exception of three conducted in Canada. The researchers believed that the findings from these Canadian studies were applicable to the United States, since both are large, industrialized countries that share a friendly border. This review did not limit the included studies by participants, such that the study participants did not need to be adolescent mothers. This is because two studies included in this review compared breastfeeding rates between teens and non-teens. Furthermore, not all of the articles included in this review reported breastfeeding initiation, exclusivity, and/or duration rates among adolescents. Nevertheless, these studies added other important information to this review regarding the factors influencing adolescent breastfeeding practices. The breastfeeding rates in this review were largely self-reported, which limits the internal validity of this study due to potential response bias. Lastly, one-third of the studies included in this review had small sample sizes, which limits the generalizability of these studies.

CONCLUSIONS

This review augments previous findings on breastfeeding intentions and behaviors among adolescent mothers and provides implications for public health efforts and future research. Clearly, education and support interventions are not enough to increase breastfeeding rates in this high-risk population. Rather, professional support needs to be developmentally sensitive to the adolescent's unique perspective and life context. In addition, early assessment of potential barriers and active engagement throughout the pre and

postnatal periods is fundamental. Ultimately, an individualized and multidisciplinary intervention targeting the unique risk factors common to this highest risk group of mothers, could be an effective tool in efforts to promote breastfeeding.

REFERENCES

1. Benefits of Breastfeeding. HealthyChildren. *American Academy of Pediatrics.* 2018;.
2. Disease Control 2.Centers, (CDC) Prevention. *Breastfeeding.* 2018.
3. Keddem Shimrit, Frasso Rosemary, Dichter Melissa, Hanlon Alexandra. The Association Between Pregnancy Intention and Breastfeeding. *Journal of Human Lactation.* 2018;34(1):97-105.
4. Kanhadilok Supannee, McGrath Jacqueline M.. An Integrative Review of Factors Influencing Breastfeeding in Adolescent Mothers. *The Journal of Perinatal Education.* 2015;24(2):119-127.
5. Sipsma Heather L., Jones Krista L., Cole-Lewis Heather. Independent Study Module for Lactation Consultants. *Journal of Human Lactation.* 2015;31(2):321-322.
6. Leclair Emily, Robert Nicole, Sprague Ann E., Fleming Nathalie. Factors Associated with Breastfeeding Initiation in Adolescent Pregnancies: A Cohort Study. *Journal of Pediatric and Adolescent Gynecology.* 2015;28(6):516-521.
7. Woods Nikki Keene, Chesser Amy K., Wipperman Jennifer. Describing Adolescent Breastfeeding Environments Through Focus Groups in an Urban Community. *Journal of Primary Care & Community Health.* 2013;4(4):307-310.
8. Martin J A, Hamilton B E, Osterman Mjk, Driscoll A K, Mathews T J. Births: final data for 2015. *Natl Vital Stat Rep.* 2017;66(1):1-1.
9. Feldman-Winter Lori, Shaikh Ulfat. Optimizing Breastfeeding Promotion and Support in Adolescent Mothers. *Journal of Human Lactation.* 2007;23(4):362-367.
10. Smith Paige Hall, Coley Sheryl L, Labbok Miriam H, Cupito Susan, Nwokah Eva. Early breastfeeding experiences of adolescent mothers: a qualitative prospective study. *International Breastfeeding Journal.* 2012;7(1):13-13.
11. Alexander A, O'riordan M A, Furman L. Do breastfeeding intentions of pregnant inner-city teens and adult women differ. *Breastfeed Med.* 2010;5(6):289-296.

12. Apostolakis-Kyrus Katherine, Valentine Christina, DeFranco Emily. Factors Associated with Breastfeeding Initiation in Adolescent Mothers. *The Journal of Pediatrics.* 2013;163(5):1489-1494.

13. Pentecost Ryoko, Grassley Jane S.. Adolescents' Needs for Nurses' Support When Initiating Breastfeeding. *Journal of Human Lactation.* 2014;30(2):224-228.

14. Sipsma Heather L., Magriples Urania, Divney Anna, Gordon Derrick, Gabzdyl Elizabeth, Kershaw Trace. Breastfeeding Behavior Among Adolescents: Initiation, Duration, and Exclusivity. *Journal of Adolescent Health.* 2013;53(3):394-400.

15. Cota-Robles Sonia, Pedersen Laura, LeCroy Craig Winston. Challenges to Breastfeeding Initiation and Duration for Teen Mothers. *MCN: The American Journal of Maternal/Child Nursing.* 2017;42(3):173-178.

16. Mossman Marion, Heaman Maureen, Dennis Cindy-Lee, Morris Margaret. The Influence of Adolescent Mothers' Breastfeeding Confidence and Attitudes on Breastfeeding Initiation and Duration. *Journal of Human Lactation.* 2008;24(3):268-277.

17. Wambach Karen A., Aaronson Lauren, Breedlove Ginger, Domian Elaine Williams, Rojjanasrirat Wilaiporn, Yeh Hung-Wen. A Randomized Controlled Trial of Breastfeeding Support and Education for Adolescent Mothers. *Western Journal of Nursing Research.* 2011;33(4):486-505.

18. Nelson A M. Adolescent attitudes, beliefs, and concerns regarding breastfeeding. *MCN Am J Matern Child Nurs.* 2009;34(4):249-255.

19. Brown Sara, Hudson Diane Brage, Campbell-Grossman Christie, Yates Bernice C.. Health Promotion Text Blasts for Minority Adolescent Mothers. *MCN: The American Journal of Maternal/Child Nursing.* 2014;39(6):357-362.

20. Logsdon M. Cynthia, Davis Deborah Winders, Stikes Reetta, Ratterman Rachel, Ryan Lesa, Myers John. Acceptability and Initial Efficacy of Education for Teen Mothers. *MCN: The American Journal of Maternal/Child Nursing.* 2015;40(3):186-192.

21. Meglio G. Di, McDermott M. P., Klein J. D.. A Randomized Controlled Trial of Telephone Peer Support's Influence on Breastfeeding Duration in Adolescent Mothers. *Breastfeeding Medicine.* 2010;5(1):41-47.

22. Olaiya O, Dee D L, Sharma A J, Smith R A. Maternity Care Practices and Breastfeeding Among Adolescent Mothers Aged 12-19 Years–United States. *MMWR Morb Mortal Wkly Rep.* 2009;65(2):17-22.

23. Nesbitt Sherry A, Campbell Karen A, Jack Susan M, Robinson Heather, Piehl Kathleen, Bogdan Janice C. Canadian adolescent mothers' perceptions of influences on breastfeeding decisions: a qualitative descriptive study. *BMC Pregnancy and Childbirth.* 2012;12(1):149-149.

24. Glass Tracy L., Tucker Keelie, Stewart Robert, Baker Teresa E., Kauffman Robert P.. Infant Feeding and Contraceptive Practices Among Adolescents with a High Teen Pregnancy Rate: A 3-Year Retrospective Study. *Journal of Women's Health.* 2010;19(9):1659-1663.

25. Tucker Christine M, Wilson Ellen K, Samandari Ghazaleh. Infant feeding experiences among teen mothers in North Carolina: Findings from a mixed-methods study. *International Breastfeeding Journal.* 2011;6(1):14-14.

26. Wambach Karen A., Cohen Susan M.. Breastfeeding Experiences of Urban Adolescent Mothers. *Journal of Pediatric Nursing.* 2009;24(4):244-254.

27. Dennis C L. The breastfeeding self-efficacy scale: psychometric assessment of the short form. *Journal of Obstetric, Gynecologic & Neonatal Nursing.* 2003;32(6):734-744.