



Published in final edited form as:

*J Adolesc Health*. 2013 September ; 53(3): 394–400. doi:10.1016/j.jadohealth.2013.04.005.

## Breastfeeding behavior among adolescents: Initiation, duration, and exclusivity

Heather L. Sipsma, PhD<sup>1</sup>, Urania Magriples, MD<sup>2</sup>, Anna Divney, MPH<sup>3</sup>, Derrick Gordon, PhD<sup>4</sup>, Elizabeth Gabzdyl, DNP<sup>1</sup>, and Trace Kershaw, PhD<sup>5</sup>

<sup>1</sup>Department of Women, Children and Family Health Science, University of Illinois at Chicago College of Nursing, Chicago, IL

<sup>2</sup>Obstetrics, Gynecology, and Reproductive Sciences, Yale School of Medicine, New Haven, CT

<sup>3</sup>City University of New York School of Public Health, New York, NY

<sup>4</sup>Department of Psychiatry, Yale School of Medicine, New Haven, CT

<sup>5</sup>Department of Chronic Disease Epidemiology, Yale School of Public Health, New Haven, CT

### Abstract

**Purpose**—Despite a substantial amount of evidence on breastfeeding among non-adolescent mothers, research and strategies uniquely designed to target adolescent mothers are critical as their rates of breastfeeding are disproportionately low and their transition to parenthood is often unlike that of older mothers. Literature to date, however, offers limited evidence for designing effective interventions. Therefore, we aim to fill this gap in the literature by examining breastfeeding behaviors among a cohort of female adolescents as they transition to parenthood.

**Methods**—Data are derived from a longitudinal cohort of pregnant adolescent females (ages 14–21) and their male partners followed from pregnancy through 6 months postpartum. Means and frequencies were used to describe breastfeeding experiences, breastfeeding behaviors, and sociodemographic characteristics. Multivariate logistic regression and Cox proportional hazards models were used to identify factors independently associated with breastfeeding initiation, exclusive breastfeeding, and breastfeeding duration.

**Results**—Approximately 71% initiated breastfeeding. Intending to breastfeed, having had complications in labor and delivery, and lower social support were associated with greater odds of breastfeeding initiation. Of the adolescent mothers who initiated breastfeeding, 84% had stopped by 6 months postpartum and among those, average breastfeeding duration was 5 weeks. Participants who exclusively breastfed had longer breastfeeding duration, and participants who had experienced intimate partner violence had shorter breastfeeding duration. Obese women and women who had more difficulty breastfeeding had lower odds of exclusive breastfeeding.

---

©2013 Society for Adolescent Medicine. Published by Elsevier Inc. All rights reserved.

Corresponding Author: Heather L. Sipsma, University of Illinois at Chicago College of Nursing, Department of Women, Children and Family Health Science, 845 South Damen Avenue (M/C 802), Chicago, IL 60612-7350, Telephone: (312) 355-2718, Fax: (312) 996-8871, sipsmah@uic.edu.

The authors have no conflicts of interest to disclose.

**Publisher's Disclaimer:** This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Conclusions**—Enhanced clinical support and the promotion of exclusive breastfeeding should be considered when designing interventions to improve breastfeeding rates among adolescent mothers.

### Keywords

adolescents; breastfeeding initiation; breastfeeding duration; exclusive breastfeeding

---

## INTRODUCTION

Breastfeeding rates remain disproportionately low among adolescent mothers. National data suggest that 60% of women less than 20 years old initiate breastfeeding, compared with almost 80% of women over 30. Additionally, only 20% of young women are still breastfeeding at 6 months compared to 50% of older women[1]. This disparity is particularly important as more than 400,000 babies are born to teenagers in the United States every year[2], and adolescents could derive significant benefits from breastfeeding, including associated financial savings, increased interpregnancy intervals, and improved maternal-infant bonding. Furthermore, breastfeeding is associated with numerous health benefits, including reduced risk of diabetes among children and breast cancer among mothers[1].

Only eight studies in the United States were found specifically examining adolescent breastfeeding experiences. Most of these studies were cross-sectional with small sample sizes, and many were qualitative [3-8]. One retrospective chart review indicated only that multiparity was associated with lower likelihoods of initiating breastfeeding[9]. Only one prospective study was found in the review of the literature[10]; however, this primarily descriptive paper was published 25 years ago.

Despite these limitations, these studies identified several factors associated with breastfeeding experiences among adolescents. Pain during breastfeeding and difficulties with latching, fatigue, milk supply, and medical complications are common reported barriers to breastfeeding as is embarrassment related to breastfeeding outside the home and returning to work or school [4,5,7,8]. Support from healthcare professionals has been associated with generally positive influences on breastfeeding experiences among adolescents, but partners and family may provide pressure to discontinue breastfeeding [5,8]. Last, prenatal intentions to breastfeed have been strong predictors of breastfeeding behavior among both adolescent and non-adolescent mothers [8,11-13].

Studies among non-adolescent mothers in the United States highlight additional factors that may influence breastfeeding behaviors among adolescents. For instance, several sociodemographic characteristics, such as greater maternal age, higher education, unemployed status, higher socioeconomic status, married status, and greater parity have all been linked to greater likelihoods of breastfeeding among non-adolescent mothers[13-15]. Non-Hispanic white women initiate breastfeeding more often and continue breastfeeding longer than non-Hispanic black or Hispanic women[14,16]. Participation in WIC may also be associated with breastfeeding, although results are inconsistent[15,17], and obesity may also influence breastfeeding behavior[18]. Women who do not smoke often have higher rates of breastfeeding initiation than women who do[15], and psychological characteristics, such as increased depression and stress have been associated with decreased likelihoods of breastfeeding[19-21]. Furthermore, perinatal factors, including prematurity, Cesarean section, labor and delivery complications, and low birthweight may reduce the mother's ability to initiate and sustain breastfeeding[13,14,16]. Attending prenatal care and childbirth classes, on the other hand, may improve a women's ability to initiate breastfeeding, particularly if breastfeeding is discussed in these contexts[22,23].

Partner and relationship characteristics may also influence adolescent breastfeeding behavior because adolescents tend to be strongly influenced by their partners and peers. Male partners' feelings about breastfeeding may be a strong predictor of breastfeeding behavior, but the literature on this association has not been well developed[24]. Furthermore, intimate partner violence may negatively affect breastfeeding, because female victims often struggle with feelings of shame, inadequacy, and low self-esteem as a result of the experience of the violence[25,26]. Evidence to support this association, however, has been sparse and inconsistent[25-27].

Research and strategies uniquely designed to target adolescent mothers are critical as their transition to parenthood is often unlike the transition experienced by older mothers[28]. Younger mothers tend to juggle parental and romantic relationships, struggles with self-esteem and self-image, and reintegrating into their peer groups and educational settings[29]. They also may be facing different concerns about breastfeeding compared with non-adolescent mothers[30] and are managing developmental tasks unique to adolescence.

Accordingly, we sought to examine breastfeeding behaviors among a longitudinal cohort of adolescents (ages 14-21, for purposes of this study) and their male partners as they transition to parenthood. Specifically, we aimed to 1) describe breastfeeding experiences and behaviors among this cohort of young females and 2) examine predictors of breastfeeding initiation and duration. Additionally, we sought to examine moderating effects by age group (ages 14-18 vs. ages 19-21), as evidence suggests younger adolescents may be substantially different from older adolescents [28].

## METHODS

### Sample

Data from this study were derived from a cohort of pregnant adolescent females and their partners, who were followed from pregnancy through 6 months postpartum. Couples were recruited between July 2007 and February 2011 from obstetrics and gynecology clinics in four university-affiliated hospitals in Connecticut. Research staff provided informational materials to the female and asked her to discuss the study with her partner if he was not present. Young women ages 14 to 21 who were in their second or third trimester of pregnancy and their partners (ages 14) were eligible to participate in the study. Further eligibility criteria included: both partners reporting a romantic relationship with one another and being the biological parents of the unborn baby, not HIV-positive, and able to speak English or Spanish. Of the 296 females who completed the baseline assessment during pregnancy (M=29 weeks gestation), 225 (76.0%) participated in the second interview, approximately six months after date of delivery (M=5.7 months) using an automated computerized self-interview (ACASI). Participation was voluntary, confidential, and did not influence the provision of health care or social services in any way. All procedures were approved by the Yale University Human Investigation Committee and by Institutional Review Boards at study clinics. Participants were paid \$25 at both the baseline and followup assessments.

### Measures

**Breastfeeding behavior and experiences**—At the baseline assessment, female participants were asked whether or not they intended to breastfeed their baby. Similarly, their male partners were asked if they wanted their partner to breastfeed his baby.

At the postpartum follow-up visit, female participants reported if they ever breastfed their baby; if so, they were considered to have initiated breastfeeding. Participants who had

initiated breastfeeding were also asked if they were currently breastfeeding, their difficulty breastfeeding (not at all, somewhat, very much), and breastfeeding exclusivity (only breastfeeding vs. mostly breastfeeding and mostly formula). Participants who had breastfed, but were not currently doing so, were asked to report the number of weeks at which they stopped breastfeeding and their reasons for doing so.

**Sociodemographic characteristics**—We included several sociodemographic variables based on the previous literature. These measures were collected at baseline and included participant age (14-18 years vs. 19-21 years), race/ethnicity (non-Hispanic Black vs. Hispanic vs. non-Hispanic white and other), current school status (yes vs. no), current employment status (full- and part-time vs. unemployed), and whether or not this was her first baby. We also created a variable to describe whether or not the participant's education was appropriate for her age, based on her self-reported years of completed education and age. If her age was 15, for instance, education appropriate for age was having completed at least 8<sup>th</sup> grade; anything less was considered education inappropriate for her age. Additionally, we asked whether or not participants received public assistance from the Women, Infant, and Children Food and Nutrition Service (WIC) and categorized participants into BMI categories [underweight (<18.5), normal weight (18.5-24.9), overweight (25.0-29.9), and obese (≥ 30.0)][31] based on self-reported prepregnancy weight and height.

**Substance use**—At baseline, female participants reported whether or not she had ever used alcohol, marijuana, or smoked cigarettes prior to her pregnancy as these constructs were hypothesized to best represent her behavior while non-pregnant.

**Psychological characteristics**—Depression was measured with the Center of Epidemiological Studies-Depression Scale (CES-D)[32]. Female participants reported how often they felt or behaved in the specified way using a Likert scale ranging from 0 (“less than 1 day a week”) to 3 (“most of the time (5-7 days a week)”). Five of the 20 items were removed because they describe depressive symptoms that also may be symptoms of pregnancy and are thus deemed less reliable during pregnancy[33]. Higher scores indicate greater depressive symptomology; internal consistency for this measure was very good ( $\alpha=0.85$ ). Stress was measured with the Perceived Stress Scale (PSS)[34]. Participants responded to 10 items asking them to indicate how often they felt specific ways during the past month using a Likert scale ranging from 0 (“never”) to 4 (“very often”). Higher scores indicate greater perceived stress; internal consistency for this measure was good ( $\alpha=0.80$ ). Social support was measured using 9 items adopted from the Medical Outcomes Study Social Support Survey (MOSS Survey)[35]. Participants indicated how often, on a 5-point scale, others were available to them for companionship, assistance, and other forms of support; responses ranged from 1=“None of the time” to 5=“All of the time.” Higher scores indicate greater support; internal consistency was excellent ( $\alpha=0.95$ ). All psychological measures were reported at baseline.

**Relationship characteristics**—At baseline, the male partners self-reported their age and race/ethnicity (non-Hispanic Black vs. Hispanic vs. non-Hispanic White and other). We also created a variable to describe whether or not the partner's education was appropriate for his age, based on his self-reported years of completed education and age. Female participants reported whether or not she lived with her partner and also responded to eight items adopted from the Decision Making Dominance Subscale of the Sexual Relationship Power Scale (SRPS)[36]. These items ask participants which partner has decision-making power. Responses include “your partner”(1), “both of you equally”(2) and “you”(3). Responses to the eight items are summed for a total score and divided by the number of valid items.

Higher scores indicated greater relationship power for the respondent. Last, female participants reported whether or not they had experienced IPV from their current partner, including any sexual violence, physical violence, threats or emotional abuse.

**Pregnancy and birth outcomes**—Prenatal care attendance and childbirth class attendance were assessed by self-report questions that asked the participants whether or not they attended prenatal care and childbirth classes. Preterm birth (<37 weeks gestational age), low birth weight (<2500 grams), type of delivery (C-Section vs. vaginal), and labor and delivery complications (any of the following complications: breech, fetal distress, infection, gestational diabetes, pre-eclampsia, macrosomia, oligohydramnios, neonatal infant care unit, prolonged rupture of membrane, pre-term premature rupture of membrane, small for gestational age, vacuum assisted delivery) were assessed using medical record abstraction.

## Statistical Analysis

We first generated descriptive means and frequencies to describe breastfeeding experiences. To determine correlates of breastfeeding initiation, we conducted an unadjusted analysis, using independent sample t-tests and chi-square tests for continuous and categorical variables, respectively. We then ran a multivariate logistic regression model to identify factors independently associated with breastfeeding initiation, entering sociodemographic characteristics as covariates and then used forward selection ( $p < 0.05$ ) in our second step to determine other factors significantly related to initiation. To examine unadjusted associations with breastfeeding duration, we used Pearson correlations and analysis of variance (ANOVA) for continuous and categorical variables, respectively. We ran a Cox proportional hazards regression model to determine independent predictors of breastfeeding cessation among participants who ever breastfed, entering sociodemographic characteristics into our model as covariates and then used forward selection ( $p < 0.05$ ) to determine other factors significantly related to breastfeeding cessation. Participants who were currently breastfeeding at the postpartum follow-up were right-censored, and their breastfeeding duration was set equal to the current age (weeks) of their baby. We tested whether or not age group significantly moderated associations between covariates and our breastfeeding outcomes using our corresponding final models, as evidence suggests younger adolescents may be substantially different from older adolescents. Interaction terms, constructed by multiplying the age group variable by the other covariates in each model, were entered one-by-one into the model to determine their significance. If significant ( $p < 0.05$ ), simple effects of the covariate on the outcome were explored for each age group. Frequency of missing data was low (<5%); all analyses were conducted with SPSS 19.

## RESULTS

### Sample characteristics

Approximately 42% of female participants were less than 19 years old at baseline, and 85% had education appropriate for her age (Table 1). Forty percent of the sample was non-Hispanic black, 42% was Hispanic, and 18% was non-Hispanic white or another race/ethnicity. At baseline approximately 43% were in school, 27% were employed, 74% received public assistance from WIC, and almost 80% were expecting their first baby.

### Breastfeeding experiences and behavior

During pregnancy, 75% of the female participants reported intending to breastfeed and 81% of their male partners reported wanting her to breastfeed (Table 2). Approximately 71% of females initiated breastfeeding. Among those who initiated breastfeeding, 22% reported having no difficulty, 43% reported having some difficulty, and 35% reported having lots of difficulty breastfeeding. Approximately 46% of participants who breastfed reported only

breastfeeding, 33% reported mostly breastfeeding, and 21% reported mostly formula-feeding. Approximately 84% of breastfeeding participants reported having stopped breastfeeding by the 6 month postpartum visit; among these participants, they breastfed for approximately 5 weeks. Almost 70% of these participants reported having no difficulty stopping breastfeeding, and 85% reported that their baby had no difficulty stopping breastfeeding. The most frequently selected reasons for stopping breastfeeding included “the baby did not like/latch on” and “it hurt”.

### **Breastfeeding initiation**

In unadjusted analysis, few factors were associated with breastfeeding initiation (Table 1). Participants who initiated breastfeeding were more likely to have intended to breastfeed ( $p<0.01$ ), to have partners who wanted them to breastfeed ( $p<0.01$ ), and to have used alcohol prior to pregnancy ( $p<0.05$ ). In our multivariate logistic regression model (Table 3), participants who intended to breastfeed had a 23-fold increased odds of breastfeeding compared with participants who did not intend to breastfeed (OR=22.84; 95% CI=9.07, 57.53). Additionally, participants with complications in labor and delivery had greater odds of breastfeeding (OR=2.85; 95% CI=1.02, 7.93). Last, greater social support was associated with significantly lower odds of breastfeeding among adolescents (OR=0.94; 95% CI=0.89, 1.00). The multivariate model explained a substantial proportion of the variance in breastfeeding initiation (Nagelkerke R-Square=0.40). We found no associations with breastfeeding initiation that were moderated by age group.

### **Breastfeeding duration**

In unadjusted analysis, longer breastfeeding duration was associated with exclusive breastfeeding, attending childbirth classes, high levels of depressive symptoms, and not having experienced intimate partner violence and (all  $p<0.05$ ). In our multivariate Cox regression model, participants who exclusively breastfed had longer breastfeeding duration on average (HR of cessation=0.61; 95% CI=0.42, 0.87). Participants who had experienced intimate partner violence, on the other hand, had shorter breastfeeding duration on average (HR of cessation=1.77; 95% CI=1.21, 2.60).

Age group significantly moderated the effect of ever experiencing intimate partner violence on breastfeeding duration (interaction HR=2.77; 95% CI=1.26, 6.05). Among younger adolescents, the effect of having experienced any violence was highly significant (HR of cessation=3.29; 95% CI=1.81, 6.01), but there was no significant effect among older adolescents (HR of cessation=1.19; 95% CI=0.72, 1.98).

### **Exclusive breastfeeding**

We then conducted a post-hoc analysis to determine predictors of exclusive breastfeeding, because it was so strongly related to breastfeeding duration. Our multivariate logistic regression model suggested that breastfeeding difficulty was a strong predictor of exclusive breastfeeding (Table 4). Females who reported that breastfeeding was somewhat difficult and very difficult had 75% and 87% lower odds of exclusive breastfeeding, respectively, compared with females who reported that breastfeeding was not at all difficult (OR=0.25; 95% CI=0.09, 0.65 and OR=0.13; 95% CI=0.05, 0.38, respectively). Furthermore, obese participants had 67% lower odds of exclusive breastfeeding compared with normal weight participants (OR=0.33; 95% CI=0.15, 0.86). We found no significant moderation by age group on breastfeeding exclusivity.

## DISCUSSION

Breastfeeding initiation rates among this sample population were higher than expected based on national data; however, rates fell short of the Healthy People 2020 goal of more than 80% [1]. Breastfeeding duration, on the other hand, was markedly short. Only 11% were breastfeeding at the 6-month visit, well below the Healthy People 2020 goal of more than 60% and national rates of 20% [1]. Among participants who initiated breastfeeding but had stopped by the 6-month postpartum visit, the average duration was less than 6 weeks, which has important implications for the health of the infant and mother. These results corroborate an earlier study on adolescents [8] and emphasize the need for greater focus on breastfeeding promotion among adolescent mothers.

Breastfeeding initiation was strongly associated with intention to breastfeed, as demonstrated in prior literature [8,11-13]. Interestingly, however, we also found that greater social support at baseline was predictive of lower likelihoods of initiating breastfeeding. These results may be similar to those found among adolescents in previous qualitative work, which describe partners and family pressuring the young mother to discontinue breastfeeding [5]. Increased support may interfere with the status of the mother as the baby's primary caregiver. A highly involved grandmother, for instance, may play a dominant role in infant-feeding decisions and lead to formula feeding [37]. The adolescent mother may feel compelled to oblige her mother, because she is providing much-needed support. Additionally, the young woman's peers may be providing social support in many ways but are not necessarily supportive of breastfeeding and may encourage her to stop. As a result, interventions to increase breastfeeding initiation may benefit from targeting not only the adolescent mother but her social support network as well. Furthermore, because the measure used for social support may reflect aspects of companionship or availability but may not adequately capture support for the adolescent mother's feeding decisions specifically, including peer and family attitudes towards breastfeeding may help clarify this result in future studies.

Participants with labor and delivery complications had greater likelihoods of breastfeeding. Although this finding initially seems counter-intuitive, we believe that the complications experienced by the adolescents were likely associated with greater support from clinical staff at the hospital and longer hospital stays during which they may have received more support to initiate breastfeeding. Additional support from nurses, for instance, may be an explanation for increased odds of breastfeeding among this subpopulation of adolescents and thus may suggest that additional attention during the postpartum period can increase breastfeeding initiation among adolescent mothers. Other qualitative work has suggested that healthcare professionals may positively influence adolescent breastfeeding experiences but may also negatively influence their experiences by feeding the infants formula [8]. Interventions may therefore be more effective if they educate and equip healthcare professionals for supporting breastfeeding among young mothers.

Breastfeeding duration was negatively associated with intimate partner violence and positively associated with breastfeeding exclusivity in our multivariate models. Prior literature suggests that intimate partner violence may impact breastfeeding duration. It is likely that continuing to breastfeed, particularly as the new mother-infant pair begins to leave their home environment more frequently, becomes increasingly difficult for those who have suffered intimate partner violence and who may be battling additional struggles with body image, particularly among younger adolescents [25,26]. Furthermore, stress from their experiences could also lead to a decrease in milk supply, which may contribute to shorter breastfeeding duration [38].

It was not surprising that breastfeeding exclusivity was associated with longer breastfeeding duration. Nonexclusive breastfeeding results in less suckling frequency which results in lower prolactin levels and consequently less milk production. Furthermore, nonexclusive breastfeeding may mark the “slippery slope” on which mothers find that supplementing with formula or other complementary foods is increasingly easier than breast pumping for the times when she must be away. Adolescents may also not like breast pumping, may feel that it is inconvenient or increasingly difficult as the baby ages. More research is needed to identify ways to increase the duration of exclusive breastfeeding, as it is a significant factor in overall breastfeeding duration.

Our analysis suggests that breastfeeding difficulty is extremely important to exclusive breastfeeding. This relationship between greater difficulty and lower likelihoods of exclusive breastfeeding highlights the need for continued support targeted to adolescents, particularly during the first six weeks. Prenatal and postpartum health care providers should engage patients in an ongoing dialogue about the critical adjustment period during which time both the new mother and baby learn to breastfeed. Furthermore, although lactation consultants are available and accessible in many hospitals, adolescents may need additional and ongoing practical support with breastfeeding as studies exploring adolescent breastfeeding have suggested that these mothers may not take the initiative to engage available resources[8]. Support delivered through peers and/or social media may be highly influential [8,39,40].

A final factor associated with breastfeeding exclusivity is pre-pregnancy BMI. Obese participants had significantly lower odds of breastfeeding compared with normal weight participants, independent of breastfeeding difficulty. These data suggest, possibly, that their body image may prevent them from breastfeeding outside their homes or in circumstances in which they feel uncomfortable. Furthermore, the actual logistics of and dexterity required to breastfeed for obese women may be a deterrent from breastfeeding. Unfortunately, however, because non-exclusive breastfeeding is associated with shorter duration, these mothers may be breastfeeding less overall and therefore are not taking full advantage of the calorie demands of breastfeeding. Since breastfeeding, on average, requires up to 500 calories per day, it has been associated with easier returns to prepregnancy weights, a critical benefit for obese mothers[1]. Additional support should therefore be targeted to these women in the hospital and over the postpartum period.

Our study found few differences in breastfeeding initiation, duration, and exclusivity between younger and older adolescents, demonstrating that the factors important for breastfeeding may be uniform across the developmental range of adolescence. The one exception was the association of IPV on breastfeeding duration, which was particularly important for younger adolescents.

Our study should be interpreted in light of limitations, including the self-reported nature of the data. Participants may have therefore over-reported breastfeeding intentions and behaviors as they may have interpreted this behavior as more socially desirable. We do not, however, believe the data to be highly affected in this manner, however, because the proportion who indicated intending to breastfeed was similar to the proportion of adolescents who actually initiated breastfeeding, even though these data were collected six months apart. Additionally, attrition may have positively biased our estimates of breastfeeding experiences and behavior. Post-hoc analysis, however, suggests that few differences exist between participants included in our analysis and those lost to follow-up. Last, some of our model estimates may be imprecise as evidenced by wide confidence intervals in our regression models.



Our study has many strengths, including the use of a prospective cohort, and fills a significant gap in the literature by providing a comprehensive analysis of breastfeeding behavior among young women. It suggests that important factors, such as enhanced clinical support and the promotion of exclusive breastfeeding, need to be considered when designing interventions to improve breastfeeding rates among adolescents in the US. Additional research and resources are needed to improve the overall health of adolescent mothers and their families.

## Acknowledgments

Supported by a grant from the National Institutes of Mental Health (1R01MH75685).

## References

1. American Academy of Pediatrics Section on Breastfeeding. Breastfeeding and the Use of Human Milk. *Pediatrics*. 2012; 129:e827–e41. [PubMed: 22371471]
2. Martin J, Hamilton B, Ventura S, et al. Births: final data for 2010. *National Vital Statistics Reports*. 2012; 61:1–100.
3. Baisch M, Fox R, Goldberg B. Breast-feeding attitudes and practices among adolescents. *Journal of Adolescent Health Care*. 1989; 10:41–5.
4. Brownell K, Hutton L, Hartman J, et al. Barriers to breastfeeding among African American adolescent mothers. *Clinical Pediatrics*. 2002; 21:669–73. [PubMed: 12462316]
5. Hannon P, Willis S, Bishop-Townsend V, et al. African-American and Latina adolescent mothers' infant feeding decisions and breastfeeding practices: a qualitative study. *Journal of Adolescent Health*. 2000; 26:399–407. [PubMed: 10822181]
6. Nelson A. Adolescent attitudes, beliefs, and concerns. *MCN*. 2009; 34:249–55.
7. Spear H. Breastfeeding behaviors and experiences of adolescent mothers. *American Journal of Maternal Child Nursing*. 2006; 31:106–13. [PubMed: 16523036]
8. Wambach K, Cohen S. Breastfeeding experiences of urban adolescent mothers. *Journal of Pediatric Nursing*. 2009; 24:244–54. [PubMed: 19632502]
9. Glass T, Tucker K, Stewart R, et al. Infant feeding and contraceptive practices among adolescents with a high teen pregnancy rate: a 3-year retrospective study. *Journal of Women's Health*. 2010; 19:1659–63.
10. Neifert M, Gray J, Gary N, et al. Factors influencing breast-feeding among adolescents. *Journal of Adolescent Health Care*. 1988; 9:470–3. [PubMed: 3182360]
11. Donath S, Amir L. The ALSPAC Study Team. Relationship between prenatal feeding intention and initiation and duration of breastfeeding: a cohort study. *Acta Paediatr*. 2003; 92:352–6. [PubMed: 12725552]
12. Lee H, Elo I, McCollum K, et al. Racial/ethnic differences in breastfeeding initiation and duration among low-income, inner-city mothers. *Social Science Quarterly*. 2009; 90:1251–71. [PubMed: 20160902]
13. Meedy S, Fahy K, Kable A. Factors that positively influence breastfeeding duration to 6 months: a literature review. *Women and Birth*. 2010; 23:135–45. [PubMed: 20299299]
14. Dennis C. Breastfeeding initiation and duration: a 1990-2000 literature review. *JOGNN*. 2002; 31:12–32. [PubMed: 11843016]
15. Ogbunau C, Glover S, Probst J, et al. Balancing work and family: effect of employment characteristics on breastfeeding. *Journal of Human Lactation*. 2011; 27:225–38. [PubMed: 21393503]
16. Li R, Odgen C, Ballew C, et al. Prevalence of exclusive breastfeeding among US infants: the third National Health and Nutrition Examination Survey (Phase II, 1991-1994). *American Journal of Public Health*. 2002; 92:1107–10. [PubMed: 12084691]
17. Chatterji P, Brooks-Gunn J. WIC participation, breastfeeding practices, and well-child care among unmarried low-income mothers. *American Journal of Public Health*. 2004; 94:1324–7. [PubMed: 15284035]

18. Amir L, Donath S. A systematic review of maternal obesity and breastfeeding intention, initiation and duration. *BMC Pregnancy and Childbirth*. 2007; 7
19. Henderson J, Evans S, Straton J, et al. Impact of postnatal depression on breastfeeding duration. *Birth*. 2003; 30:175–80. [PubMed: 12911800]
20. Li J, Kendall G, Henderson S, et al. Maternal psychosocial well-being in pregnancy and breastfeeding duration. *Acta Paediatrica*. 2008; 97:221–5. [PubMed: 18254911]
21. Taveras E, Capra A, Braveman P, et al. Clinician support and psychosocial risk factors associated with breastfeeding discontinuation. *Pediatrics*. 2003; 112:108–15. [PubMed: 12837875]
22. Lu M, Prentice J, Yu S, et al. Childbirth education classes: sociodemographic disparities in attendance and the association of attendance with breastfeeding initiation. *Maternal and Child Health Journal*. 2003; 7:87–93. [PubMed: 12870624]
23. Lu M, Lange L, Slusser W, et al. Provider encouragement of breast-feeding: evidence from a national survey. *Obstetrics & Gynecology*. 2001; 97:290–5. [PubMed: 1116597]
24. Sipsma H, Divney A, Magriples U, et al. Breastfeeding intentions among pregnant adolescents and their partners. *Journal of Women's Health* under review.
25. Cerulli C, Chin N, Talbot N, et al. Exploring the impact of intimate partner violence on breastfeeding initiation: does it matter? *Breastfeeding Medicine*. 2010; 5:225–6. [PubMed: 20942705]
26. Moraes C, de Oliveira A, Reichenheim M, et al. Severe physical violence between intimate partners during pregnancy: a risk factor for early cessation of exclusive breast-feeding. *Public Health Nutrition*. 2011; 14:2148–55. [PubMed: 21729486]
27. Silverman J, Decker M, Reed E, et al. Intimate partner violence around the time of pregnancy: association with breastfeeding behavior. *Journal of Women's Health*. 2006; 15:934–40.
28. Kingston D, Heaman M, Fell D, et al. Comparison of adolescent, young adult, and adult women's maternity experiences and practices. *Pediatrics*. 2012; 129:e1228–e37. [PubMed: 22529278]
29. Dykes F, Moran V, Burt S, et al. Adolescent mothers and breastfeeding experiences and support needs - an exploratory study. *Journal of Human Lactation*. 2003; 19:391–401. [PubMed: 14620453]
30. Kennedy M. Teens and breastfeeding. *International Journal of Childbirth Education*. 2000; 15:20–3.
31. Rasmussen, K.; Yaktine, A., editors. Committee to Reexamine IOM Pregnancy Weight Guidelines. *Weight Gain During Pregnancy: Reexamining the Guidelines*. Institute of Medicine; 2009.
32. Radloff L. The CES-D scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977; 1:385–401.
33. Orr S, Miller C. Maternal depressive symptoms and the risk of poor pregnancy outcome: review of the literature and preliminary findings. *Epidemiologic Reviews*. 1995; 17:165–71. [PubMed: 8521934]
34. Cohen, S.; Williamson, G. Perceived stress in a probability sample of the United States. In: Spacapan, S.; Oskamp, S., editors. *The Social Psychology of Health*. Sage; Newbury Park, CA: 1988.
35. Sherbourne C, Stewart A. The MOS social support survey. *Social Science & Medicine*. 1991; 32:713–4.
36. Pulerwitz J, Gortmake S, DeJong W. Measuring sexual relationship power in HIV/STD research. *Sex Roles*. 2000; 42:7–8.
37. Bentley M, Gavin L, Black M, et al. Infant feeding practices of low-income, African-American, adolescent mothers: an ecological multigenerational perspective. *Social Science & Medicine*. 1999; 49:1085–100. [PubMed: 10475672]
38. Hill P, Humenick S. Insufficient milk supply. *Journal of Nursing Scholarship*. 2007; 21:145–8.
39. Malow R, Kershaw T, Sipsma H, et al. HIV preventive interventions for adolescents: a look back and ahead. *Current HIV/AIDS Reports*. 2007; 4:173–80. [PubMed: 18366948]
40. Sawyer S, Afifi R, Bearinger L, et al. Adolescence: a foundation for future health. *Lancet*. 2012; 37:1630–40. [PubMed: 22538178]

### IMPLICATIONS AND CONTRIBUTION

Breastfeeding rates are disproportionately low among adolescents. The current literature offers limited evidence for designing effective interventions. We examine breastfeeding behaviors among female adolescents as they transition to parenthood. Results suggest important factors to consider, including enhanced clinical support and the promotion of exclusive breastfeeding, for improving breastfeeding among adolescents.

**Table 1**

Sample characteristics overall and by breastfeeding initiation

	Ever breastfed			P-value*
	Overall N=225	Yes n=160 (71.1%)	No n=65 (28.9%)	
<i>Breastfeeding experiences</i>				
Intended to breastfeed	168 (75.0%)	141 (88.7%)	27 (41.5%)	<0.001
Partner wanted her to breastfeed	180 (80.7%)	140 (88.1%)	40 (62.5%)	<0.001
<i>Sociodemographic characteristics</i>				
Age				0.895
15-18	95 (42.2%)	68 (42.5%)	27 (41.5%)	
19-21	130 (57.8%)	92 (57.5%)	38 (58.5%)	
Race/ethnicity				0.312
Black	90 (40.0%)	59 (36.9%)	31 (47.7%)	
Hispanic	94 (41.8%)	71 (44.4%)	23 (35.4%)	
Non-Hispanic white/Other	41 (18.2%)	30 (18.8%)	11 (16.9%)	
Education appropriate for age	191 (84.9%)	136 (85.0%)	55 (84.6%)	0.942
Currently in school	97 (43.1%)	71 (44.4%)	26 (40.0%)	0.548
Currently employed (FT or PT)	60 (26.7%)	46 (28.8%)	14 (21.6%)	0.268
Receives WIC public assistance	167 (74.2%)	122 (76.3%)	45 (69.2%)	0.182
First baby	178 (79.5%)	126 (79.2%)	52 (80.0%)	0.899
Prepregnancy BMI				0.830
Underweight	15 (6.7%)	10 (6.3%)	5 (7.7%)	
Normal weight	111 (49.3%)	82 (51.3%)	29 (44.6%)	
Overweight	43 (19.1%)	30 (18.8%)	13 (20.0%)	
Obese	56 (24.9%)	38 (23.8%)	18 (27.7%)	
<i>Substance use</i>				
Any alcohol use prior to pregnancy	105 (46.7%)	82 (51.3%)	23 (35.4%)	0.031
Any pot use prior to pregnancy	62 (27.6%)	42 (26.3%)	20 (30.8%)	0.492
Any smoking prior to pregnancy	79 (35.1%)	55 (34.4%)	24 (36.9%)	0.717
<i>Psychological characteristics</i>				
Depression	10.8 ± 7.37	11.1 ± 7.62	10.2 ± 7.70	0.418
Perceived stress scale	17.0 ± 6.48	17.4 ± 6.32	16.0 ± 6.81	0.144

	Ever breastfed			P-value*
	Overall N=225	Yes n=160 (71.1%)	No n=65 (28.9%)	
Social Support	28.0 ± 7.66	27.6 ± 7.90	28.9 ± 7.00	0.249
<i>Relationship characteristics</i>				
Partner's age	21.2 ± 3.71	21.1 ± 3.50	21.5 ± 4.19	0.461
Partner's education appropriate for age	161 (71.6%)	115 (71.9%)	46 (70.8%)	0.868
Partner's race/ethnicity				0.305
Black	112 (49.8%)	75 (46.9%)	37 (56.9%)	
Latino	87 (38.7%)	64 (40.0%)	23 (35.4%)	
White/Other	26 (11.6%)	21 (13.1%)	5 (7.7%)	
Live with partner	131 (58.2%)	97 (60.6%)	34 (52.3%)	0.252
Relationship power	2.0 ± 0.25	2.0 ± 0.25	2.0 ± 0.25	0.548
Any intimate partner violence (IPV)	71 (31.6%)	49 (30.6%)	22 (33.8%)	0.637
<i>Pregnancy and birth outcomes</i>				
Prenatal care attendance	214 (95.1%)	150 (93.8%)	64 (98.5%)	0.137
Labor/childbirth class attendance	15 (6.7%)	12 (7.5%)	3 (4.6%)	0.432
Preterm birth	21 (9.7%)	17 (11.0%)	4 (6.3%)	0.289
Low birthweight	14 (6.5%)	11 (7.2%)	3 (4.6%)	0.544
Vaginal delivery	166 (73.8%)	120 (75.0%)	46 (70.8%)	0.513
Labor and delivery complications	47 (21.7%)	36 (23.4%)	11 (17.5%)	0.337

\* P-values correspond to independent sample t-tests and chi-square tests for continuous and categorical variables, respectively

**Table 2**

## Participant breastfeeding experiences and behavior

	N (%)
<i>Overall (N=225)</i>	
Intended to breastfeed	168 (75.0%)
Partner wanted her to breastfeed	180 (80.7%)
Ever breastfed your baby	160 (71.1%)
<i>Among participants who ever breastfed (N=160)</i>	
Difficulty breastfeeding	
Not at all	35 (21.9%)
Somewhat	69 (43.1%)
Very much	56 (35.0%)
During the time you were breastfeeding, baby was fed	
Only by breastfeeding	73 (45.6%)
Mostly breastfeeding but with a small amount of formula, juice, water or solid foods	53 (33.1%)
Mostly by formula, juice, water or solid foods with a small amount of breastfeeding	34 (21.3%)
Have stopped breastfeeding	135 (84.4%)
<i>Among those who breastfed their baby, but no longer do (N=135)</i>	
Number of weeks stopped breastfeeding	5.2 ± 4.42 Range: 0 – 20
Difficulty for you to stop breastfeeding	
Not at all	93 (68.9%)
Somewhat	35 (25.9%)
Very much	7 (5.2%)
Difficulty for your baby to stop breastfeeding	
Not at all	115 (85.2%)
Somewhat	20 (14.8%)
Very much	0
Reasons for stopping breastfeeding	
It hurt	47 (34.8%)
Went back to school or work	23 (17.0%)
To get pregnant again	0
Baby did not like/latch on	56 (41.5%)
Just did not like breastfeeding	18 (13.3%)
Worried smoking/diet/meds might hurt baby	10 (7.4%)
Hard for dad to be involved	11 (8.1%)

	N (%)
Other	35 (25.9%)

**Table 3**Multivariate logistic regression model predicting ever breastfeeding<sup>1,2</sup>

	OR (95% CI)
Ever Breastfed: Logistic Regression (N=215)	
<i>Breastfeeding experiences</i>	
Intended to breastfeed	22.84 (9.07, 57.53) **
<i>Sociodemographic characteristics</i>	
Age	
15-18	1.04 (0.47, 2.31)
19-21	1.00
Race/ethnicity	
Black	1.00
Hispanic	2.10 (0.93, 4.73)
Non-Hispanic white/Other	2.08 (0.72, 5.99)
Currently in school	0.78 (0.35, 1.74)
Education appropriate for age	0.68 (0.22, 2.07)
Currently employed	1.49 (0.61, 3.63)
Receives WIC public assistance	1.17 (0.50, 2.70)
First baby	0.49 (0.18, 1.35)
Pregnancy BMI	
Underweight	1.49 (0.30, 7.34)
Normal weight	1.00
Overweight	0.55 (0.21, 1.47)
Obese	0.44 (0.18, 1.08)
<i>Psychological characteristics</i>	
Social Support	0.94 (0.89, 1.00) *
<i>Pregnancy and birth outcomes</i>	
Labor and delivery complications	2.85 (1.02, 7.93) *

<sup>1</sup> Model constructed by entering participant age, race/ethnicity, school status, whether or not she had attained education appropriate for age, employment, WIC participation, and whether or not it was her first baby; then selecting the remaining variables using forward selection (pin<0.05)

<sup>2</sup> Nagelkerke R-Square=0.40

\* p<0.05;

\*\* p<0.01



**Table 4**

Multivariate logistic regression model predicting exclusive breastfeeding, among participants who reported ever breastfeeding (N=159)<sup>1,2</sup>

	OR (95% CI)
<i>Breastfeeding experiences</i>	
Difficulty breastfeeding	
Not at all	1.00
Somewhat	0.25 (0.09, 0.65)**
Very much	0.13 (0.05, 0.38)**
<i>Sociodemographic characteristics</i>	
Age	
15-18	0.90 (0.34, 2.33)
19-21	1.00
Race/ethnicity	
Black	1.00
Hispanic	1.28 (0.58, 2.83)
Non-Hispanic white/Other	0.88 (0.31, 2.44)
Currently in school	1.38 (0.66, 2.90)
Education appropriate for age	1.05 (0.40, 2.78)
Currently employed	1.41 (0.62, 3.22)
Receives WIC public assistance	0.39 (0.17, 0.91)*
First baby	0.90 (0.36, 2.24)
Prepregnancy BMI	
Underweight	0.67 (0.15, 2.95)
Normal weight	1.00
Overweight	0.96 (0.38, 2.42)
Obese	0.33 (0.13, 0.86)*

<sup>1</sup>Model constructed by entering participant age, race/ethnicity, school status, years of education, employment, WIC participation, and whether or not it was her first baby; then selecting the remaining variables using forward selection (pin<0.05)

<sup>2</sup>Nagelkerke R-Square=0.25

\* p<0.05;

\*\* p<0.01