

# Validation and psychometric properties of breastfeeding attitude scale among a sample of childless adult females



*Kritee Niroula, MS, Erin M. McKinley, PhD, RD, LD, CLC, CHES, FAND,  
Elizabeth A. Gollub, PhD, MPH, RD*

## Abstract

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**Background:** Breastfeeding is an appropriate way of providing young infants with the nutrients needed for healthy growth and development. Breastfeeding rates in Louisiana are the lowest in the nation (66.2%). This study aimed to measure the breastfeeding attitude of college-aged childless females in Louisiana to identify if there are existing misconceptions or negative perceptions that may act as a hindrance to breastfeeding in the future.

**Objective:** (1) To develop a scale to measure breastfeeding attitudes among a sample of college-aged childless females in the southeastern US.

(2) test the psychometric properties of the breastfeeding attitude scale by determining its internal consistency and validity.

(3) Assess the relationships between breastfeeding attitudes and intentions among the study participants.

**Methods:** A cross-sectional survey was set up targeting a convenience sample of childless female students attending a public university in Louisiana. This study utilized a web-based survey with a new breastfeeding attitude scale and items to assess breastfeeding intention and demographics. Further, the Kruskal Wallis test, Mann-Whitney test, and Chi-square were used to study the data due to the nonnormality of the dataset.

**Results:** The mean attitude score of the sample was  $60.94 \pm 7.44$  with 91.6% indicating intention to breastfeed future children. Cronbach's alpha for the attitude scale was 0.796, indicating sufficient validity of the scale to measure breastfeeding attitudes among childless females. The correlation between the

total breastfeeding attitude and total breastfeeding intention in this sample was positive and significant ( $p \leq 0.001$ ).

**Conclusions:** This study developed a new, valid scale to measure breastfeeding attitudes among college-aged childless females. It could be used in other similar studies targeting this population. Future research should aim to validate the true breastfeeding attitudes scale among a larger sample of childless females.

**Keywords:** *Breastfeeding attitudes, breastfeeding intentions, childless females, college-aged females*

## 1. INTRODUCTION

Breastfeeding is an appropriate way of providing infants with the nutrients needed for healthy growth and development.<sup>1</sup> The World Health Organization (WHO) actively promotes breast milk as the optimal source of nourishment for infants and young children.<sup>2</sup> Recommendations state “exclusive breastfeeding for about 6 months, followed by continued breastfeeding as complementary foods are introduced, with the continuation of breastfeeding for 1 year or longer as mutually desired by mother and infant.”<sup>3,4</sup> Infants may benefit from breastfeeding of any type or duration. Not only does breastfeeding provide energy and nutrients, but it also protects infants against gastrointestinal infections, and may reduce mortality rates. In addition, breastfed children may have higher intelligence test scores and improved productivity in the future.<sup>2</sup> The benefits of breastfeeding are not exclusive to infants, as mothers who breastfeed also receive several benefits. According to the American Academy of Pediatrics (AAP), the maternal benefits of breastfeeding are decreased postpartum bleeding and uterine contraction.<sup>4</sup> Despite these recommendations, the rate of exclusive breastfeeding has not met the goals in either developed or developing countries.<sup>5</sup> According to Global Breastfeeding Scorecard 2021, only 48% of babies are breastfed within one hour of birth. Similarly, only 44% of babies under six months are exclusively breastfed.<sup>6</sup> In the United States, among ever breastfed infants born in 2017, Minnesota (95.3%), Idaho (94.6%), and Oregon (93.2%) have the highest breastfeeding rates while the Southern states of

Alabama (69.0%) and Louisiana (66.2%) have the lowest rates. Additionally, in Louisiana, 41% of the infants were breastfeeding at six months, with 21.8% breastfeeding at 12 months. Only 21.8% were exclusively breastfed for up to six months.<sup>7</sup> According to the 2020 CDC Breastfeeding Report Card, breastfeeding is regarded as a key health behavior to help improve public health in the United States.<sup>7</sup> An Ethiopian study among primiparous women concluded that a positive breastfeeding attitude can help predict exclusive breastfeeding practices.<sup>8</sup>

Researchers define breastfeeding attitude to be the readiness for breastfeeding behavior which may include a like or dislike, the belief about the importance of breastfeeding, and beliefs about the positive health benefits.<sup>9</sup> A study by Hamze et al. claims that a positive maternal attitude is regarded as a significant indicator of initiation and prolonged breastfeeding.<sup>10</sup> The decision of whether or not to breastfeed is reported to be highly dependent on breastfeeding attitude, which is formed early in life as an adolescent<sup>11</sup> or during early adulthood.<sup>12</sup> Young, college-aged women are an important demographic in which to identify misconceptions or negative perceptions that may act as a hindrance to breastfeeding in the future.<sup>13</sup> Padmanabhan and colleagues stated the importance of seeking out these gaps in the research and acting upon them, as young women will be entering motherhood in the future.<sup>14</sup> In spite of the importance of having positive attitudes toward breastfeeding behavior, no tools have been developed targeting the childless female population to date. Highlighting the need for

a validated tool and based on the literature related to breastfeeding attitudes and intentions, the current study aims to (1) develop a scale to measure breastfeeding attitude, (2) test its psychometric properties by determining the internal consistency and validity, and (3) assess the relationships between breastfeeding attitude and breastfeeding intention among college-attending women in Louisiana.

## 2.METHODS

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### *Study Design*

A cross-sectional survey design was used, targeting a convenience sample of young adult female university students in Louisiana. This study intended to measure the attitudes and intentions of childless females to breastfeed in the future. The study was approved by Louisiana State University AgCenter Institutional Review Board.

### *Setting*

Data collection was carried out at a public university in Louisiana over 8 weeks, from September to November 2019. This university student body included individuals from all over the country, with approximately 54% identifying as female.

### *Sample*

To be included in the study, a participant had to be 18 years of age or older, a student attending that university, and identify as a female. Male students were excluded because the study focused on females and health behavior exclusive to them. Females less than 18 years were also not included as they are not considered adults. The responses

of participants above 45 years (above the child-bearing age) were not included in the study.

### *Sample Size Determination*

Using the Open-Source Epidemiologic Statistics for Public Health (OpenEpi) version 3.01, the sample size needed was calculated to be 1025. OpenEpi is open-source software for epidemiological statistics.<sup>15</sup>

### *Measurements*

**Breastfeeding Intention.** Breastfeeding intention can be stated as “a participant’s desire or consideration to ‘exclusively breastfeed’ or ‘breastfeed in any amount’ in the future”.<sup>16</sup> The intentions section was set up with the question “Do you intend to breastfeed your child in the future?” with answer choices “Yes” or “No”. The intention scale was dichotomous with options “Yes” or “No” where “Yes” was categorized as “1” and “No” as “0.” Three other questions were included to find out the participants’ thoughts about breastfeeding practice. The questions included “Returning to work would make you stop feeding with breast milk; I would not breastfeed in public, i.e., in a restaurant or in a park even if covered; I would not breastfeed in public, i.e., in a restaurant or in a park, uncovered.”

**Breastfeeding Attitude Scale.** Breastfeeding attitude is defined as the readiness for breastfeeding behavior which may include a like or dislike, the belief about the importance of breastfeeding, and beliefs about the positive health benefits.<sup>9</sup> The attitude scale included 16 items. The Principal Investigator (PI) and other research committee

members prepared a list of concepts related to breastfeeding attitude to be included in the scale and gleaned additional concepts from previous studies to check if any major content area was missing.<sup>17,18</sup> A measurement scale expert reviewed and confirmed the content validity of the scale. A 5-point Likert scale with 1 meaning “Strongly disagree” and 5 meaning “Strongly agree” was used, providing scores ranging from 16-80. The scores would serve as a variable in which to compare breastfeeding attitude, breastfeeding intention, and demographic items.

**Demographics.** The questions included in this section were the participants’ age, race, marital status, work status, college major as enrolled, whether they were breastfed as a child, participants’ year in college, and whether they were US or international students. A screener question was added at the beginning of the survey to ask if participants wanted to have child/children in the future. This question led to the division of participants into two groups: women who did not want to have kids into group 1 and who did not want kids into group 2.

**Pilot Study.** Before data collection began, a panel of three survey development experts tested the scale for face and content validity. A pilot study with five childless female students was conducted to test the readability of the questionnaire, comprehensibility of the survey items, and completion time. They were handed the printed version of the survey and requested to return it after they completed it. The survey took 5-10 minutes to be completed. It also served as an opportunity to assess and confirm the face validity of the at-

titude scale. There were no issues relating to the survey comprehension therefore no changes were made to the survey after the pilot study. The responses of the pilot study were also included in the main study.

### ***Data Collection***

The survey was formatted in Qualtrics to be accessible on a desktop or laptop computer, as well as a mobile phone or tablet. Paper copies were available in case someone requested one. The study information and consent script were presented on the first page of the survey with a question asking if the potential participant did or did not agree to continue with the survey. To recruit participants, a list of courses taught during that semester was used. Their respective instructors and professors were contacted via email to request 10 minutes of class time for data collection. We were granted permission to access 72 undergraduate and graduate classes. During that time, the research team explained the purpose of the survey and asked interested students to participate. Most of the students completed the survey during class time. Course instructors also shared the survey link with students through email in case they wanted to do it after class or on their own time. Approved flyers with the survey information and link were also posted on announcement boards across the university to recruit more participants. A total of 1016 participants completed the study.

### ***Data Analysis***

First, the mean attitude score and its range were computed. Using the Shapiro-Wilk proce-

dure, the dataset was found to be non-normal and non-parametric statistics were used. The Cronbach’s alpha and Exploratory Factor Analysis with no rotation were used to determine the internal consistency and validity of the scale. Three of the demographic variables were collapsed (i.e., combined in a way where no more than 2 or 3 subcategories were created) to make it easier for analysis and interpretation. Mann-Whitney and Kruskal-Wallis tests were applied to determine statistical differences between different demographics. To analyze the reliability of different factors in the scale, Spearman’s correlation was performed. This was also used to determine the relationship between the three factors and breastfeeding attitudes and intentions. Chi-Square tests assessed differences in breastfeeding intention among the participant characteristics. Statistical

Package for Social Sciences (SPSS) 2019 version 26 was used for the statistical analysis.<sup>19</sup>

### 3.RESULTS

The mean age of the sample was 19.85 (2.21) years. Among them, the highest numbers were from age groups 18 and 19. More than 98% were unmarried and more than half (53.31%) were working either full- or part-time. About 77% of the study sample was White and 14% African American. More information about the sample characteristics can be found in Table 1. The whole sample was divided into two groups based on their plans to have children in the future. The number of participants who wanted to have kids (group 1) was 934 (92%) while those who did not want to have kids (group 2), was 82 (8%).

**Table 1.** *Demographics and descriptive statistics for the study sample of childless, female college students (N=1016)*

Demographics	n (%)
<b>Marital Status</b>	
Married	13(1.31)
Unmarried	981(98.69)
<b>Age (years)</b>	
18	246(24.77)
19	298(30.01)
20	189(19.03)
21	127(12.79)
22 and above	133(13.39)
<b>Work status</b>	
Yes	530(53.32)
No	464(46.68)

<b>Demographics</b>	<b>n (%)</b>
<b>BF while going back to work</b>	
Yes	699(70.68)
No	290(29.32)
<b>Race</b>	
White	762(76.66)
African American	139(13.98)
Other	93(9.36)
<b>BF in public while being uncovered</b>	
Yes	335(33.87)
No	654(66.13)
<b>BF in public while being covered</b>	
Yes	183(18.50)
No	806(81.49)
<b>International student status</b>	
Yes	100(10.07)
No	893(89.93)
<b>Class year</b>	
Freshmen	266(26.84)
Sophomore	319(32.19)
Junior	215(21.70)
Senior	162(16.35)
Graduate	29(2.93)
<b>College major</b>	
STEM	363(36.52)
Non-STEM	631(63.48)
<b>Ever breastfed as an infant</b>	
Yes	649(77.08)
No	193(22.92)

*Note:* BF – Breastfeeding

STEM – Science, Technology, Engineering and Mathematics



**Study Aim #1: Breastfeeding Attitude Scale Development**

At first, confirmatory factor analysis was performed on the breastfeeding attitude scale with the 16 items. The Chi-square value was calculated to be 1157.18 with a degree of freedom of 87 and a p-value  $\leq 0.001$ . This analysis was forced to the factors of misconceptions, benefits, cultural aspects based on a literature-driven assumption of which items seemed to fit with each proposed factor, but the model did not fit. Further statistical analysis was carried out using exploratory factor analysis (EFA). Thus, three factors were determined using this process: (I) breastfeeding as a cultural norm in the US, (II) benefits of breastfeeding, and (III) common misconceptions about breastfeeding. The mean attitude scores and ranges were calculated for each factor. This information can be seen in Table 2. The mean attitude

score of the entire sample was 60.94 out of 80 (7.44). The range was from 28.00 to 80.00. Table 2 also lists the entire items of the scale differentiating them according to their respective factors.

**Study Aim #2: Internal Consistency**

Normality was assessed using the Shapiro-Wilk test and the dataset was found to be non-normally distributed. Non-parametric statistics were used for the data analysis. The Cronbach’s alpha for the survey was calculated to be 0.80, with item-to-total correlations ranging from 0.32 to 0.71. While Cronbach’s alpha scores for the three factors were 0.82, 0.62, and 0.48 respectively. The 16 items on the scale explained 56.2% of the total variance. Table 2 summarizes the descriptive statistics and included items for each factor in the scale.

**Table 2.** Cronbach’s alpha and means of the factors of the Breastfeeding Attitude Survey Scale

Factors	Cronbach’s alpha	Sample Mean (SD)	Items
Breastfeeding as a cultural norm in the US (8 items)	0.82	28.97 (4.10)	<p>I think that it is acceptable for women to breastfeed in public.</p> <p>Breastfeeding is an intimate activity that should be kept private.</p> <p>Information that endorses breastfeeding should be included in middle/high school education curriculum.</p> <p>Seeing a woman breastfeed makes me uncomfortable.</p> <p>Healthcare providers should inform all mothers about the distinctive benefits of breastfeeding.</p>



Factors	Cronbach's alpha	Sample Mean (SD)	Items
			<p>It is important to promote a breastfeeding-friendly culture in the United States.</p> <p>Breastfeeding will help a mother feel closer to her baby.</p> <p>I respect women who breastfeed.</p>
Benefits of Breastfeeding (4 items)	0.62	13.40 (2.75)	<p>Babies who are fed breastmilk are healthier than babies who are fed formula.</p> <p>Breastfed babies are smarter than babies who are not breastfed.</p> <p>Breastmilk is cheaper than formula.</p>
Common Misconceptions (4 items)	0.48	14.59 (2.27)	<p>Breastfeeding is more convenient than formula feeding.</p> <p>Formula feeding is a better choice if the mother plans to go back to work during the child's first year of life.</p> <p>A mother cannot return to work while feeding her baby with breastmilk.</p> <p>Breastfed babies are more likely to be overfed than formula fed babies.</p> <p>A father may feel "left out" if a mother breastfeeds the baby.</p>

Note: SD – Standard Deviation

**Study Aim #3: The Relationship between Breastfeeding Attitude and Intention and the participant characteristics**

*Breastfeeding Intention*

Among the total study population, 91.61% of childless females said they had intentions to breastfeed which indicated a high intention to breastfeed their children in the future. Based on chi-squares, it was found that “being breastfed as an infant and the students’ college major” were the factors associated with breastfeeding inten-

tions. Table 3 shows different demographics and their respective chi-square values.

Spearman’s rank correlation was used to determine the correlations between the factors and total breastfeeding attitude, and breastfeeding intention. Factor I, breastfeeding as a cultural norm in the US, was significantly (p-value ≤ 0.001) and highly correlated (r = 0.878) with the total breastfeeding attitude. Factor II, benefits of breastfeeding, was significantly (p-value ≤ 0.001) and correlated (r = 0.599) with the total breastfeeding

**Table 3.** *Breastfeeding intention by participant characteristics*

<b>Demographics</b>	<b>X<sup>2</sup></b>	<b>df</b>	<b>p-value</b>
Age	5.995	4	0.199
Marital status	0.009	1	0.925
Work status	0.277	1	0.599
BF while going back to work	0.536	1	0.464
BF in public while being uncovered	18.70	1	<0.001*
BF in public while being covered	5.835	1	<0.001*
International student status	0.036	1	0.850
Class year	4.491	4	0.344
College major	6.102	1	0.014*
Race	2.953	2	0.228
Ever Breastfed as an infant	82.131	1	<0.001*

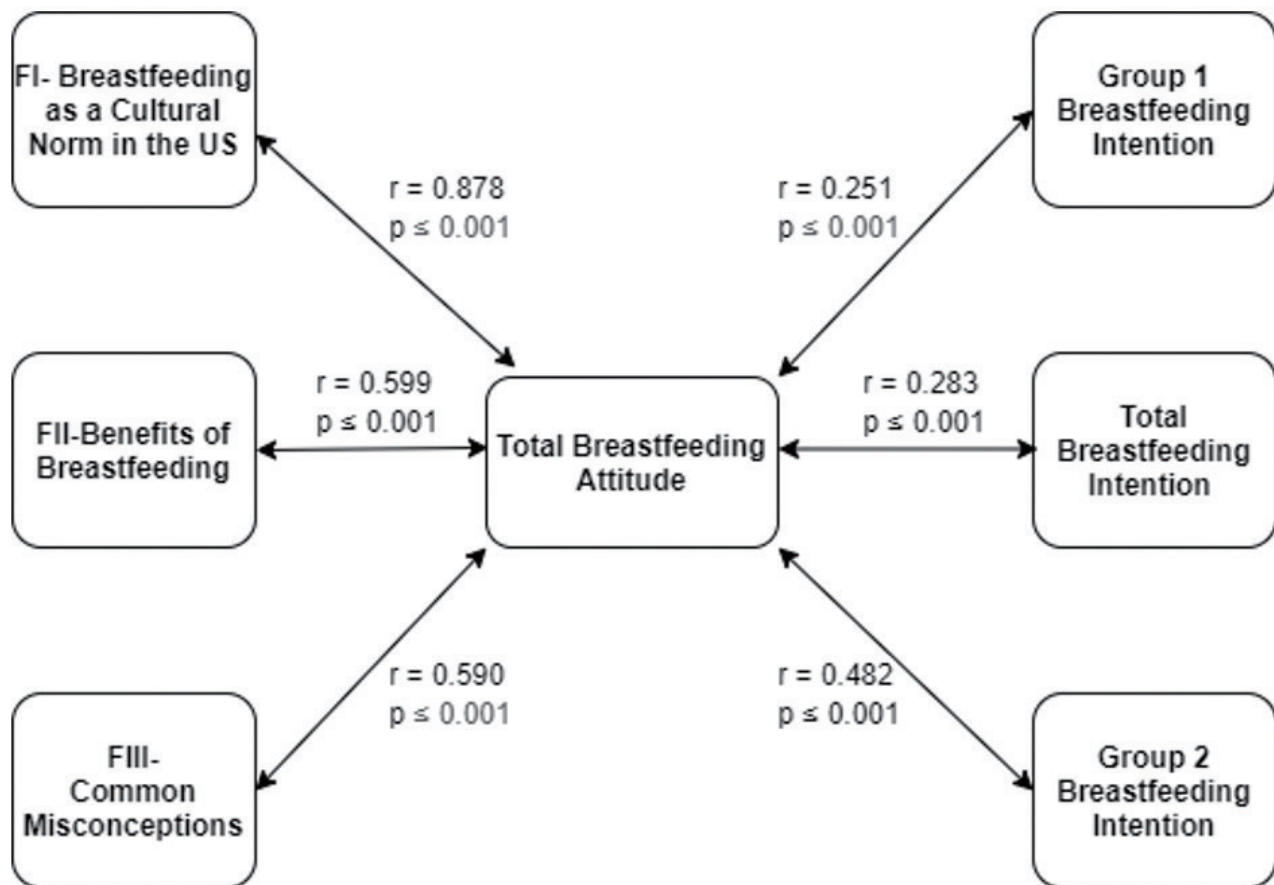
Note: \* Statistically significant (p<0.05)

BF - Breastfeeding

attitude. Similarly, Factor III, common misconceptions, had positive and significant correlations with the  $p$ -value  $\leq 0.001$  and  $r = 0.590$ . The relationship between the total breastfeeding attitudes and total breastfeeding intention of the whole sample was positively correlated ( $r = 0.283$ ) and significant ( $p$ -value  $\leq 0.001$ ). These different significant correlations between factors and the total breastfeeding attitude and breastfeeding intentions are clearly shown in Figure 1.

When comparing the mean breastfeeding attitude scores among participant characteristics in Table 4, the mean scores were higher among married participants. Age was significant and the mean scores of participants of age 22 years and above being was higher scores than 18-, 19-, and 21-year-old participants. Participants who worked either part-time or full-time had significantly higher scores than those who did not work at all. When making a comparison among races, Black students had significantly higher scores compared

**Figure 1.** Model of breastfeeding attitude and breastfeeding intention among childless, female college students



to White students. International students' mean attitude score was higher but was not significantly different compared to participants from the US. Comparing the scores of students according to their years in college, graduate students and senior undergraduate students had higher mean scores for breastfeeding attitudes but those scores were not significant. Similarly, the students from STEM (Science, Technology, Engineering, and Mathematics) majors scored significantly higher than non-STEM majors ( $p\text{-value} \leq 0.001$ ). Stu-

dents were also asked whether they were breastfed when they were infants. Students who were breastfed as infants also had statistically significantly higher scores compared to students who were not breastfed as infants ( $p\text{-value} \leq 0.001$ ). Although they had positive attitudes related to breastfeeding, most of the participants did not agree with the item about breastfeeding their future children in public even if they covered themselves up. Mean breastfeeding attitude scores with standard deviations can be found in Table 4.

**Table 4.** Mean breastfeeding attitude score by participant sociodemographic characteristics

Demographics	Mean (SD)	p-value
<b>Marital Status</b>		0.117
Married	64.15(6.35)	
Unmarried	60.90(7.44)	
<b>Age (years)</b>		0.002*
18	60.25(7.48)	
19	60.39(7.15)	
20	61.35(6.55)	
21	60.59(7.74)	
22 and above	63.23(8.45)	
<b>Work Status</b>		0.002*
Yes	61.77(7.13)	
No	51.99(7.67)	
<b>BF while going back to work</b>		<0.001*
Yes	60.03(7.07)	
No	63.19(7.84)	
<b>Race</b>		0.002*
White	60.48(7.41)	
African American	62.49(7.23)	
Other	62.45(7.48)	

<b>Demographics</b>	<b>Mean (SD)</b>	<b>p-value</b>
<b>BF in public while being uncovered</b>		<0.001*
Yes	57.32(7.27)	
No	62.82(6.82)	
<b>BF in public while being covered</b>		<0.001*
Yes	56.19(7.24)	
No	62.04(7.06)	
<b>International student status</b>		0.477
Yes	61.44(8.29)	
No	60.88(7.34)	
<b>Class year</b>		
Freshmen	60.27(7.31)	
Sophomore	60.30(7.44)	
Junior	61.34(6.59)	
Senior	62.27(7.89)	
Graduate	63.59(9.85)	
<b>College major</b>		<0.001*
STEM	62.25(7.77)	
Non-STEM	60.19(7.13)	
<b>Ever breastfed as an infant</b>		<0.001*
Yes	61.96(7.12)	
No	59.02(7.86)	

Note: \* Statistically significant ( $p < 0.05$ )

BF – Breastfeeding

STEM – Science, Technology, Engineering and Mathematics

#### 4. DISCUSSION

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This study resulted in the development of a new, valid scale to measure the breastfeeding attitude among college-aged, childless females, a population with the potential to be future mothers who need good knowledge about the physiology and importance of breastfeeding. Cultivating a positive breastfeeding attitude among this age group is important as it may contribute towards successful breastfeeding as they enter motherhood. The scale can be used to measure the breastfeeding attitudes of childless females irrespective of race, education, and socioeconomic status. To the best of our knowledge, a tool that comprehensively measures factors that influence breastfeeding attitude in our target population does not currently exist. A few of the studies<sup>20,21</sup> available in the literature have used the Iowa Infant Feeding Attitude Scale<sup>17</sup>, which focuses on overall infant feeding rather than just breastfeeding. Further, this scale has lower Cronbach's alpha scores among a higher number of participants. Most of the tools used among other populations have been tested among a very few participants not making sure if they are reliable enough to be used.

Results from this current study revealed that a positive attitude was found among the participants regarding breastfeeding. Participants of age 22 years and older had the highest scores for breastfeeding attitudes. This might be because they received more information during their major of study or through a personal experience such as a breastfeeding family member or friend. The participants in this age group might be more

interested in the breastfeeding process as they are more likely to have plans to give birth and breast-feed compared to the participants of 18-20 years. Similar results were found in a study conducted among undergraduate students at the University of Tennessee where students 20 years and older scored higher on breastfeeding attitude scales than students younger than 20 years.<sup>20</sup> Similarly, participants who were married scored higher compared to unmarried. Participants from the STEM educational background had a significant difference in breastfeeding attitudes between the STEM and Non-STEM students. Students from these areas might be aware of the physiology and benefits of breastfeeding/lactation for infants and mothers due to majors related to human nutrition and animal sciences. Studies at universities and colleges in the southern United States reported that students had problems with breastfeeding in public. A study among students in Alabama in 1997 found breastfeeding in public to be embarrassing.<sup>22</sup> Results were similar even in 2012 at the University of Tennessee where the undergraduate students were not supportive of breastfeeding in public.<sup>20</sup> Both studies had similar concerns over breastfeeding in public. Students who were breastfed when they were infants had a more positive attitude, which suggests that they might have grown up in a breastfeeding-friendly culture. There may be additional underlying factors contributing to breastfeeding attitude that needs to be studied in detail.

A study conducted in Indonesia states that women with higher breastfeeding intentions are 5 times more likely to initiate breastfeeding than those with lower intentions.<sup>23</sup> Similarly, breast-

feeding knowledge and breastfeeding attitude are known to be significant predictors of intention to breastfeed.<sup>24</sup> Since breastfeeding knowledge and attitudes influence breastfeeding intention, and intention influences initiation, interventions to improve breastfeeding knowledge and attitude should be the prime focus of every professional working in the field of maternal and child nutrition. Many college-aged adult females will likely be mothers in the future, and they are the ones initiating breastfeeding as they embrace motherhood. So, knowing their attitudes and intentions about breastfeeding is important as their breastfeeding behavior will be determined by breastfeeding initiation. Determining the need for interventions while knowing their attitudes and intentions will help reach breastfeeding goals in the future.

### ***Limitations***

The study used a convenience sample of female undergraduate and graduate students at one public university in the Southeastern United States, therefore not all students at the university nor any other college or university had an equal chance to participate. The results of this study do not represent the views of all students at this university nor any other university or college students in the US. Further, this sample of college-aged childless females may not represent the general population of women in Louisiana or the U.S. in general. The questionnaire answers were self-reported, so participants may have chosen options that they felt were more desirable. They may also have misinterpreted items leading to the choice of answers that did not truly reflect their

true attitudes and thoughts about breastfeeding. The majority of the study population was White and is known to have a greater inclination toward breastfeeding. The results of this study might have been influenced by the higher percentage of the White population. Further, lower Cronbach's alphas show lower internal consistencies among the scale items that fell into Factor II (0.62) and Factor III (0.48) indicating not all the factors in this scale may be best measuring breastfeeding attitude among this population.

### **5.CONCLUSIONS**

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This new scale can be used as a valid measure for assessing breastfeeding attitudes among childless, college-aged females. Total breastfeeding attitude had significant and positive correlations with the three individual attitude scale factors and breastfeeding intention. Results found overall positive attitudes among participants of higher age, who were married, and those from STEM academic majors of study contributing more to those higher scores. However, most of the students did not agree with openly breastfeeding their future children in public. Although this scale can be used again in future studies or programs, it still needs more work as shown by the lower internal consistencies among the scale items in Factor II and Factor III. Future research studies should conduct this type of research in a larger, more diverse sample of adult childless females. Additional studies may further reflect the need for programs and interventions to increase and maintain favorable attitudes among this population of women in the US. As the fact cannot be denied that as current childless females decide to have



children, they will determine future breastfeeding rates. Their positive attitudes and intentions to breastfeed could be some of the major variables to consider in efforts to increase breastfeeding rates throughout the country.

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**Author Information**

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Kritee Niroula<sup>1</sup>, Erin M. McKinley<sup>1</sup>, Elizabeth A. Gollub<sup>1</sup>

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<sup>1</sup> Louisiana State University and LSU AgCenter School of Nutrition and Food Sciences

***Corresponding author:***

Kritee Niroula, MS  
Louisiana State University and LSU AgCenter  
School of Nutrition and Food Sciences  
252 Knapp Hall  
Baton Rouge, LA 70803  
Phone: 225-577-8362  
Email: [knirou1@lsu.edu](mailto:knirou1@lsu.edu)

**STATEMENT OF AUTHOR CONTRIBUTIONS**

KN contributed to the concept, analysis, and interpretation, drafted the manuscript, critically revised the manuscript, and agrees to be accountable for all aspects of the work ensuring integrity and accuracy. EM contributed to the concept, analysis, and interpretation, drafted the manuscript, critically revised the manuscript, and agrees to be accountable for all aspects of the work ensuring integrity and accuracy. EG contributed to the concept, analysis, and interpretation, critically revised the manuscript and agrees to be accountable for all aspects of the work ensuring integrity and accuracy.

**STATEMENT OF POTENTIAL CONFLICT OF INTEREST**

Kritee Niroula – No conflicts of interest.  
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