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## Breastfeeding in Public: Knowledge and Perceptions on a University Campus

Jessica Tracy Weiss  
*University of Arkansas, Fayetteville*

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# **Breastfeeding in Public: Knowledge and Perceptions on a University Campus**

An Honors Thesis submitted in partial fulfillment of the requirements for Honors Studies in  
Nursing

Jessica Tracy Weiss, BSN-RN

College of Education and Health Professions

Eleanor Mann School of Nursing, University of Arkansas

NURS 598V

Dr. Allison Scott

Dr. Kelly Vowell Johnson

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### **Abstract**

Research has shown that exclusive breastfeeding is the best source of nutrition for most infants and offers numerous physical and psychosocial benefits for the newborn and mother. Returning to work or attending university courses and maintaining exclusive breastfeeding is a challenge due to barriers such as time, private space, and public perception of breastfeeding in public. The aim of our study is to provide data, identify barriers and assess education needs to support breastfeeding mothers on a university campus. This study utilizes an adapted version of the Breastfeeding Behavior Questionnaire (BBQ), the Iowa Infant Feeding Attitude Scale (IIFAS), and knowledge questions. Our survey yielded 623 returned responses, 503 were considered usable due to partial responses. Overall, our respondents had a positive view towards breastfeeding as evidenced by high scores on the IIFAS section of the survey. Respondents were aware of the benefits of breastfeeding, but had reservations related to breastfeeding in public and whether or not breastfeeding was considered normal. Respondents also indicated a lack of knowledge regarding breastfeeding choice, duration, and economic benefits. In conclusion, while there is general awareness of the benefits of breastfeeding, there is a lack of overall acceptance of breastfeeding normalcy amongst the college population. Furthermore, there is a knowledge deficit regarding the laws which protect mothers right to breastfeed in public on a national and state level. Although there is a positive attitude toward breastfeeding in public, a closer analysis indicates a need for normalization and suggests that stigma, shame and sexualization of breastfeeding still exist in this population. Further research should be conducted due to the small sample size and other generalizability to other campus populations.

## **Breastfeeding in Public: Knowledge and Perceptions on a University Campus**

In the United States, breastfeeding is a public health issue. Exclusive breastfeeding for the first six months of life is essential to infant and mother for nutritional, physical and psychosocial benefits. Failure to exclusively breastfeed has resulted in an estimated \$3 billion a year in medical costs for mother and child and contribute over 3,000 excess deaths (Moss et al., 2019). With an increase of single-parent households and women entering the workforce, mothers are being forced to choose between education/career and the wellness of self and child (OES, 2020). Returning to work or attending university courses and maintaining exclusive breastfeeding is a challenge due to barriers such as time, private space, and public perception of breastfeeding in public. This study is intended to provide data for continued research on potential barriers to exclusive breastfeeding in a university setting, including knowledge of resources, laws, and current breastfeeding attitudes. With this study, we have explored the knowledge and attitudes of the University of Arkansas. Identifying and assessing the current perspective is essential in the effort toward normalizing breastfeeding. The results will be used to create focused support for breastfeeding mothers on a university campus. Creation of educational materials and support measures will be implemented and studied, following this pilot, by the faculty mentor in 2021. This is a pilot study to explore barriers to current breastfeeding support on two university campus'. This study was also conducted at the Auburn University, a campus of similar geography, size, age, and ethnicity. Auburn University has a breastfeeding support program similar to the University of Arkansas. This paper will focus only on the results at the University of Arkansas.

## **Definitions**

*Exclusive breastfeeding:* Feeding your baby only breastmilk, not any other foods or liquids including infant formula or water (CDC, 2020).

*Breastfeeding:* The action of feeding a baby with milk from the breast (Oxford University Press, 2021).

*Lactation:* The secretion of milk by the mammary glands (Oxford University Press, 2021)..

*Culture:* The customs and social institutions of a particular social group (Oxford University Press, 2021).

*Attitude:* A settled way of thinking or feeling about someone or something, typically reflected in a person's behavior (Oxford University Press, 2021).

*Knowledge:* The theoretical or practical understanding of a subject (Oxford University Press, 2021).

## **Literature Review**

### **Breastfeeding as a health intervention**

Extensive research has shown that exclusive breastfeeding is the best source of nutrition for most infants, providing physiological and psychological benefits. The Agency for Healthcare Research and Quality (AHRQ) report reaffirmed the health benefits of breastfeeding and the health risks associated with formula feeding and early weaning from breastfeeding. Infants who are not breastfed experience more episodes of diarrhea, ear infections, and lower respiratory tract infections and are at higher risk of sudden infant death syndrome, diabetes, and obesity. Infants who are breastfed have reduced risk of asthma, acute otitis media (ear infections) and necrotizing enterocolitis (NEC) (AWHONN, 2015). Breastfeeding also helps protect mothers from breast and ovarian cancer, type 2 diabetes and hypertension. Suboptimal rates of breastfeeding are

estimated to cost over \$3 billion a year in medical costs for mother and child and contribute over 3,000 excess deaths (Moss et al., 2019). The psychological benefits of breastfeeding are often overlooked but cannot be understated. Specifically, breastfeeding mothers report reductions in anxiety and stress, as well as improved mood when compared to formula-feeding mothers (Krol & Grossmann, 2018). This finding becomes more profound when presented in conjunction with the prospective study led by Hadmin and Tamim which found that breastfeeding mothers were less likely to be diagnosed with postpartum depression (Krol & Grossmann, 2018). Short term psychological benefits of breastfeeding for the infant include increased attachment security and increased mother-infant gaze period, an indication of bonding and affection (Krol & Grossmann, 2018). In the long term, infants who breastfed for longer duration showed improved cognitive development as measured by the Communicative Developmental Inventory and Ages and Stages Questionnaire as well as improved problem-solving abilities in children with prolonged duration of exclusive breastfeeding (Krol & Grossmann, 2018). It is indisputable that exclusive breastfeeding provides numerous health benefits to the mother and infant throughout their lifespan, making paramount the normalization and education of breastfeeding, as well as the importance of duration and exclusivity.

### **Barriers to breastfeeding**

Even in 2021, breastfeeding is a public health issue. In the United States, only 1 in 4 infants is exclusively breastfed as recommended by the time they are six months old (CDC, 2020). Although most infants receive some breastmilk, most are not exclusively breastfeeding or continuing to breastfeed as long as recommended. To maintain lactation and exclusively breastfeed for 6 months, for optimal health benefits, women must find time and private space to

breastfeed or pump approximately every 3 hours. Returning to work or attending university courses is a challenge due to barriers, such as time, private space, and public perception of breastfeeding in public. A qualitative study conducted at one multi-campus university (Burns & Triandafilidis, 2019) found that one of the most common reasons for cessation of breastfeeding is the return to work or study. Women found that some staff, “held resentment” towards breastfeeding mothers for taking lactation breaks and described the experience as stressful, horrible, and demoralizing (Burns & Triandafilidis, 2019). Through detailed interview, participants explained that by breastfeeding at work they were viewed as less professional, and new moms were forced to make the decision between being a good mother and a good employee or university student (Burns & Triandafilidis, 2019). In addition to feelings of self-consciousness and shame, logistical problems such as lack of awareness of or access to breastfeeding spaces on campus posed as a barrier to breastfeeding and women were subjected to breastfeeding in the so-called privacy of their vehicles, disabled bathroom stalls, and co-ed prayer rooms. These logistical problems turned into physiological problems for some as explained by Burns & Triandafilidis (2019)

. . . two weeks into the start of semester, so two weeks of delivering lectures, I just had to stop breastfeeding. I couldn't do it, because of the stress and being out and not just able to feed . . . my supply went...to be just abysmal, so I stopped (p. 4).

I remember coming into work for a half day meeting and feeling too embarrassed to ask my male supervisor for time during the day to express. My breasts were enormous and extremely painful by the end of the day and it was horrible sitting in the meeting and

feeling the let-down reflex and hoping that I didn't start leaking through my shirt. The whole meeting was made up of men or women who hadn't had children and already I felt that my maternity leave from the project had been a hindrance so asking for 30 minutes to breastfeed was just more of me being a hassle. In the end when I returned to work full-time after 10 months maternity leave, I decided it was easier to wean than to try and maintain breastfeeding (p. 4).

Cessation of breastfeeding is more likely when return to work occurs in the first 10 months, overlapping with the critical and recommended 6-month practice of breastfeeding exclusivity (Burns & Triandafilidis, 2019). Jefferson (2016), in a study of college students in the mid-west United States, found that students viewed breastfeeding as having positive health benefits, but formula as more convenient. This correlated with most prior research finding similar results, despite college students' view of breastfeeding in public as variable. The problem with breastfeeding being considered inappropriate for the public becomes increasingly concerning as the definition of public varies. Kaufman et al. (2009) found that that lower income African American mothers described even certain spaces within their own homes as public. One study of college student's perception of public breastfeeding found a negative attitude towards breastfeeding in the presence of a guest in the home, but a positive attitude towards breastfeeding in a restaurant (Kendall, 2018). Contrastingly, Zhuang et al. (2018) describes what is known as the, "ick factor," a feeling of disgust and embarrassment some people experience when they observe or even imagine the bodily functions of another person in public. In this study, higher education was correlated with less stigma and ick response compared to lower levels of education. This is relevant to our research as our population is students and faculty at the

University of Arkansas, an institution of higher education. Furthermore, Zhuang et al. (2018) cites lack of co-worker support as a leading factor in the decision to terminate breastfeeding, but the prevalence of the “ick factor” in the workplace and higher education communities creates an unsupportive environment for breastfeeding mothers. Ayton (2019) describes the experience of one mother, Tammie, age 23. Tammie chose to breastfeed despite being socially shamed. She was told breastfeeding was ‘dirty,’ ‘disgusting,’ and that they should do that [breastfeed] in private. With an increasing number of women in workforce and higher education setting, breastfeeding is no longer an activity that can or should be reserved for the home. The public perception of breastfeeding is not well understood and appears to change based on innumerable factors such as location and situation. The stigmatization real or perceived of breastfeeding combined with the logistic barriers of time, space and privacy, deters mothers from breastfeeding exclusively for the six months to ensure maximum benefit (Ayton, 2019).

### **Legislation and education**

State and federal laws have been implemented in attempt to mitigate these barriers and promote normalcy of breastfeeding in public, specifically in the workplace. The first of these laws was introduced in 1994, when Florida became the first state to enact breastfeeding legislation. Unfortunately, they did not require all employers to accommodate nursing mothers (such as by providing a private space for lactation) and yet they became the template for states to follow until 2010. In 2010, breastfeeding in the workplace became federally protected with the signing of the Patient Protection and Affordable Care Act. The Affordable Care Act, colloquially known as Obamacare, stands in jeopardy due to the politicization of national healthcare and increasing polarity of political parties. Currently, Arkansas has two laws that support

breastfeeding mothers. The first of which, ‘Act 680: 20-27-2001. Breastfeeding in public’ states that, “A woman may breastfeed a child in a public place or any place where other individuals are present.” This 2007 law also amended the AR indecency law (Code 5-14-112) to provide protection from prosecution for indecent exposure (ADH, 2017). The second, ‘Act 621: 11-5-116. Break time for expressing breast milk’, states that an employer shall provide: 1) reasonable unpaid break time and 2) a reasonable private, secure and sanitary location other than a toilet and close to work location. The employee shall make reasonable efforts to minimize disruption to employer’s operations (ADH, 2017). Other states, such as Montana, have enacted more states laws to protect families who chose to breastfeed (Nguyen & Hawkins, 2013). Similar disparities by state creates a geographical divide summarized by Nguyen and Hawkins, “Women in the Midwest are less likely to be covered by breastfeeding laws than women in other regions.” (Nguyen & Hawkins, 2013). Hawkins et al. (2013) found that enacting breastfeeding laws increased breastfeeding rates, particularly in minority groups. Furthermore, enacting breastfeeding laws promoted both the initiation and duration of breastfeeding (Hawkins et al., 2013). On college campuses in Arkansas, students are protected by the Civil Rights Act of 1964 which states that any school or university which receives federal funding cannot discriminate for any reason. Not allowing a mother to breastfeed, express, or pump in a public area is discrimination and a college campus is a public area (ADH, 2017). Despite these strides, in a cross-sectional survey of 1,000 working adults, less than one-third of participants said that their workplace provided a mothering room despite the state law to provide a private space to pump breastmilk (Zhuang et al., 2018). Over 1 in 10 of the participants did not know if their workplace did or did not provide a mothering room (Zhuang et al., 2018). This issue extends outside of the workplace. On a college campus, it was found that, “The awareness of both federal and state

breastfeeding laws was generally low among college students” (Anderson, 2018, p. 2214). It is questionable if these laws are being implemented and enforced, or if mothers are being made aware of the resources available to them.

### **The nurses role**

Registered nurses have a crucial role in the promotion and education of exclusive breastfeeding. We are poised throughout the community available for assessment and intervention, education, research, and advocacy. According to the United States Bureau of Labor Statistics, nurses make up a workforce nearly 3,000,000 strong, comprising the largest stratum of healthcare employees (OES, 2020). Diane Spatz, RN and breastfeeding expert states, “As healthcare professionals we can advocate to universities or colleges that we have been or currently are affiliated with to address the need for lactation accommodations on campus.” (Spatz, 2019, p.117) in her call to action for the needs of breastfeeding mothers on university campuses. At an individual level, nurses are the bedside communicator, educator and advocate. We have the ability and obligation to make significant and change regarding breastfeeding knowledge and awareness on a college campus.

## **Methodology**

### **Overview**

This study was conducted following approval from the University of Arkansas Institutional Review Board.

### **Design**

This pilot, cross-sectional study investigates the current attitudes and knowledge related to breastfeeding on a college campus through an online survey distributed to college (undergraduate and graduate) students and faculty, utilizing a convenience sample. Data was collected to assess breastfeeding knowledge, awareness of state laws protecting breastfeeding, and attitudes towards breastfeeding in public using an anonymous Qualtrics survey. Measurement of data utilized adapted versions of the BBQ (Breastfeeding Behavior Questionnaire), IIFAS (Iowa Infant Feeding Attitudes Scale), and knowledge questions regarding state laws and current campus lactation resources. The IIFAS consists of 17 attitude questions of which eight questions are favorable toward breastfeeding and nine questions are favorable toward formula feeding. The IIFAS is designed to encompass various dimensions of influence such as affordability, stigma, physiological and psychological benefits for mother and child. This tool is used widely due to its reliability and validity in assessing attitudes toward infant feeding methods.

### **Study population**

The study population consisted of a convenience sample of University of Arkansas community members including staff, faculty, undergraduate, and graduate students recruited using online formats including social media promotion (Instagram), Arkansas Newswire, GroupMe, and email. As incentive to complete the survey, respondents had the option to input their email for the chance to be randomly chosen for one of five \$50 Amazon gift-cards.

### **Study procedures**

The respondents were asked to indicate the extent to which they agree with statements on a five-point Likert scale ranging from 'strongly agree' to 'strongly disagree.' The scores were then computed so that a low score reflected a preference for breastfeeding. Correlations were

analyzed among these variables and separately between demographics. A modified BBQ presented five scenario-based statements. Of which, three statements took a negative view of breastfeeding in public, and two statements took a positive view of breastfeeding in public. The respondents were asked to indicate the extent to which they agreed or disagreed with the statements on a five-point Likert scale ranging from ‘strongly disagree’ to ‘strongly agree.’ The scores were then computed so that a higher score reflected a positive view toward breastfeeding in public. Five knowledge-based questions were posed in true/false/I don’t know format, specific to the campus at which the survey was conducted (University of Arkansas or University of Auburn). Four questions were then asked regarding knowledge of state laws in Arkansas (or Alabama for Auburn survey) related to breastfeeding in the same true/false/I don’t know format. One question was presented regarding federal breastfeeding laws in the same true/false/I don’t know format. Four breastfeeding knowledge questions were posed in multiple choice format, one was specifically related to cost. Finally, five demographic questions were asked of the respondent including; status at the university, gender, ethnicity, do you have children, and age. In total, the survey consisted of 42 questions formatted into 14 prompts/pages for user friendliness.

### **Timeline**

Survey distribution began in August 2020 and ended In April 2021.

### **Demographics**

623 returned responses, 503 usable (**80.74% usable rate**)

**Table 1.1 Participants’ status at the University**

Status	Frequency	%
Undergraduate student	262	52.1
Graduate student	44	8.7
Faculty	78	15.5
Administrative support/staff	104	20.7
Other	12	2.4
Missing	3	0.6

Status	Frequency	%
Total	503	100.0

**Table 1.2 Demographics of Participants**

	Students ( <i>n</i> =306)		Employees ( <i>n</i> =194)		Overall ( <i>n</i> =500)	
	Frequency	%	Frequency	%	Frequency	%
Ethnicity						
White	258	84.3	169	87.1	430	85.5
Hispanic	12	3.9	5	2.6	17	3.4
African American	7	2.3	7	3.6	14	2.8
Native American	1	0.3	6	3.1	7	1.4
Asian/Pacific	12	3.9	4	2.1	16	3.2
Other	16	5.2	3	1.5	19	3.8
Gender						
Male	22	7.2	23	11.9	45	8.9
Female	281	91.8	170	87.6	454	90.3
Gender Diverse	1	0.3	1	0.5	2	0.4
Prefer not to answer	2	0.7	0	0.0	2	0.4
Children						
Yes	33	10.8	152	78.4	187	37.2
No	273	89.2	42	21.6	316	62.8
Age	M=23.00, SD=5.82		M=41.36, D=11.97		M=29.93, D=12.40	

## Analysis

Of 503 usable survey responses, the survey was primarily taken by those who identified as White, female, and undergraduate students. Ninety percent of respondents did not have children. The survey asked participants various questions regarding their breastfeeding knowledge and attitudes concerning breastfeeding laws in Arkansas and breastfeeding in public. The data was analyzed in the Statistical Package for the Social Sciences (SPSS) software and Excel to provide a more specific assessment of the participants response. While 93.1% of the participants felt neutral or agreed that they would be comfortable with a woman breastfeeding in public (Table 2), nearly half of participants (46.6%) agreed with the statement that, “Women should take measures to cover themselves while breastfeeding in public” (Table 2). This indicates there is still a significant discomfort, sexualization, or shame regarding breastfeeding in

public. Furthermore, only 35.9% of participants felt that breastfeeding was considered normal in their culture (Table 2). This is evidence that as a college community, there is room for improvement regarding the normalization and acceptance of breastfeeding.

**Table 2: Frequencies of Attitude Scale** (higher score indicated positive)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I would be comfortable if a mother were to breastfeed in public, such as at work or in a restaurant.	279 (55.6%)	161 (32.1%)	27 (5.4%)	27 (5.4%)	8 (1.6%)
Mothers should take measures to cover themselves when breastfeeding in public.	67 (13.3%)	167 (33.3%)	129 (25.7%)	79 (15.7%)	60 (12.0%)
Mothers should avoid breastfeeding in public.	14 (2.8%)	15 (3.0%)	42 (8.3%)	148 (29.4%)	284 (56.5%)
In my culture, breastfeeding in public is considered normal.	47 (9.4%)	133 (26.5%)	146 (29.1%)	151 (30.1%)	25 (5.0%)
I would feel embarrassed to see a mother breastfeed in public.	10 (2.0%)	10 (2.0%)	40 (8.0%)	163 (32.5%)	278 (55.5%)
Attitude Score	Internal Consistency Cronbach's $\alpha = .78$ M=3.96, SD=0.77				

Respondents indicated a knowledge deficit related to campus resources for breastfeeding mothers as evidenced by the results of the campus subset of Table 3.

**Table 3: Frequencies of Knowledge Scale, Campus**

	True	False	Don't Know
<b>Campus</b>			
Designated breastfeeding areas exist across campus.	234 (46.5%)	27 (5.4%)	242 (48.1%)
There are at least 13 designated breastfeeding areas on campus.	69 (13.7%)	32 (6.4%)	402 (79.9%)
Based on the State law, designated space, including employee office space, must be available on campus.	288 (57.3%)	11 (2.2%)	204 (40.6%)
A campus map of breastfeeding areas is available online.	125 (24.9%)	34 (6.8%)	244 (68.4%)
Private breastfeeding space at some university athletic events is currently offered.	210 (41.8%)	16 (3.2%)	276 (55.0%)

Nearly half of respondents reported not knowing designated breastfeeding areas exist across campus at all. Eighty percent of respondents indicate that they do not know how many designated breastfeeding areas exist, and 69% do not know that a campus map of breastfeeding

areas is available to them online. This confirms the need for increased awareness and visibility of campus resources for breastfeeding students and staff.

The knowledge of benefit of choice of breastfeeding was mixed with only 45.3% of participants correctly choosing “Exclusive or only breastfeeding” as recommended by the Centers for Disease Control for Infant Nutrition and Health (Table 4). However, nearly all participants were aware that breastfeeding is the most beneficial choice when feeding an infant less than 6 months as evidenced by only 0.2% of respondents selecting “No breastfeeding” (Table 4). This demonstrates an improvement in adult Americans general awareness of the importance of breastfeeding for infant health compared to previous literature (CDC, 2019). Knowledge of benefit of breastfeeding duration is more varied, with nearly equal number of respondents answering, “6 months,” “12 months,” and “I don’t know” as an adequate duration of breastfeeding. This suggests a need for increased education regarding the optimal duration of breastfeeding for infant and mother health and wellness.

**Table 4: Frequencies of Benefit Choice, Duration, and Economic Benefits**

	Frequency	%
When feeding an infant less than 6 months, the most beneficial choice is:		
Partial breastfeeding	13	2.6
Predominant or mostly breastfeeding	189	37.6
Exclusive or only breastfeeding	228	45.3
No breastfeeding	1	0.2
I don’t know	72	14.3
Which of the following is an adequate duration for breastfeeding?		
Until baby is 6 months old	97	19.3
Until baby is 12 months old	228	47.4
Until baby is 18 months old and beyond	89	17.7
I don’t know	78	15.5
Which of the following is true regarding breastfeeding and economic benefits?		

	Frequency	%
It has been estimated that the U.S. economy could save over \$10 billion per year in pediatric health cost, if 90% of women breastfed for the first year of life.	229	45.7
There is little evidence that healthcare costs would change if the majority of mothers breastfed in the U.S.	30	6.0
I don't know.	242	48.3

While there is awareness of the need for breastfeeding, it seems the details such as optimal duration are lacking. The greatest knowledge deficit is seen with regards to the federal and state laws regarding breastfeeding. A surprising 67.9% of participants responded that they did not know whether federal law provides “Break time for nursing mother’s provision states break time to express breast milk be provided to an employee, up to 1 year after the child’s birth” (Table 5). Nearly half of the participants stated that they were aware of the existence of state laws regarding breastfeeding in Arkansas, approximately 30-40% of respondents indicated that they did not know the answer to the questions about state laws (Table 5).

**Table 5: Frequencies of Knowledge Scale, Law**

	True	False	Don't Know
<b>State Law</b>			
Your employer is legally required to give you break time to breastfeed, but this break time may not be paid in all workplaces.	267 (53.1%)	14 (2.8%)	222 (44.1%)
Your employer is legally required to make a reasonable effort to provide a clean, secure, and private area to breastfeed apart from the bathroom stall.	282 (56.1%)	23 (4.6%)	298 (39.4%)
A woman has the legal right to breastfeed in public.	338 (67.2%)	11 (2.2%)	154 (30.6%)
Before taking this survey, I was aware there are laws related to breastfeeding in the State of Arkansas.	234 (46.6%)	198 (39.4%)	70 (13.9%)
<b>Federal Law</b>			
The federal law “Break time for nursing mother’s provision” states break time to express breast milk be provided to an employee, up to 1 year after the child’s birth.	159 (31.7%)	2 (0.4%)	341 (67.9%)
<b>Personal Attitude</b>			
A woman has the ethical right to breastfeed in public.	471 (93.8%)	12 (2.4%)	19 (3.8%)
Breastfeeding laws matter to me.	438 (87.8%)	31 (6.2%)	30 (6.0%)

Again, this shows there is a need for increased awareness and education so that mothers can be aware of the full scope of the resources and rights entitled to them.

The modified IIFAS used indicated an overall positive attitude toward breastfeeding opposed to formula feeding as indicated by a high score when presented 17 attitude questions of which eight questions are favorable toward breastfeeding and nine questions are favorable toward formula feeding (Table 6). Cronbach's alpha score indicates high reliability of our sample.

**Table 6: Frequencies of Perception Scale** (higher score indicated positive)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The benefits of breastfeeding last only as long as the baby is breastfed.	16 (3.2%)	22 (4.4%)	50 (10.0%)	224 (44.6%)	190 (37.8%)
Breastfeeding increases mother-infant bonding.	349 (69.5%)	128 (25.5%)	16 (3.2%)	4 (0.8%)	5 (1.0%)
Formula feeding is more convenient than breastfeeding.	35 (7.0%)	117 (23.3%)	184 (36.7%)	108 (21.5%)	58 (11.6%)
Breastmilk is lacking in iron.	2 (0.4%)	35 (7.0%)	214 (42.7%)	172 (34.3%)	78 (15.6%)
Formula fed babies are more likely to be overfed than breastfed babies.	42 (8.3%)	156 (31.0%)	205 (40.8%)	81 (16.1%)	19 (3.8%)
Breast milk is cheaper than formula.	271 (53.9%)	165 (32.8%)	39 (7.8%)	14 (2.8%)	14 (2.8%)
Formula feeding is the better choice if the mother plans to go back to work.	10 (2.0%)	55 (11.0%)	153 (30.5%)	187 (37.3%)	97 (19.3%)
Mothers who formula feed miss one of the great joys of motherhood.	42 (8.4%)	105 (20.9%)	119 (23.7%)	145 (38.9%)	92 (18.1%)
Breastfed babies are healthier than formula fed babies.	81 (16.2%)	145 (28.9%)	158 (31.5%)	89 (17.8%)	28 (5.6%)
Breastfed babies are more likely to be overfed than formula fed babies.	4 (0.8%)	8 (1.6%)	187 (37.3%)	216 (43.0%)	87 (17.3%)
Fathers feel left out if a mother breastfeeds.	5 (1.0%)	56 (11.1%)	94 (18.7%)	213 (42.3%)	135 (26.8%)
Breast milk is the ideal food for babies.	210 (42.0%)	184 (36.8%)	84 (16.8%)	20 (4.0%)	2 (0.4%)
Breast milk is more easily digested than formula.	180 (35.9%)	153 (30.5%)	145 (28.9%)	20 (4.0%)	4 (0.8%)
Formula is as healthy for an infant as breast milk.	26 (5.2%)	139 (27.6%)	157 (31.2%)	127 (25.2%)	54 (10.7%)
Breastfeeding is more convenient than formula.	94 (18.7%)	123 (24.5%)	157 (31.2%)	116 (23.1%)	13 (2.6%)
A mother who occasionally drinks alcohol should not breastfeed her baby.	61 (12.2%)	93 (18.6%)	96 (19.2%)	179 (35.7%)	72 (14.4%)
Perception Score	Internal Consistency Cronbach's $\alpha$ = .80 M=3.62, SD=0.50				

Knowledge of economic benefit was explored in Table 7, in which respondents indicated almost equally the correct choice and, "I don't know." This would suggest that of those in our

sample who know there is an economic influence from a mother's choice to breastfeed, that it skews positively for the U.S. economy, and therefore suggests a positive view toward breastfeeding. Only 6% of respondents chose the incorrect response.

**Table 7: Frequencies of Economic Benefits**

	Frequency	%
Which of the following is true regarding breastfeeding and economic benefits?		
It has been estimated that the U.S. economy could save over \$10 billion per year in pediatric health cost, if 90% of women breastfed for the first year of life.	229	45.7
There is little evidence that healthcare costs would change if the majority of mothers breastfed in the U.S.	30	6.0
I don't know.	242	48.3

### University of Arkansas Breastfeeding Survey Results

623 returned responses, 503 usable (80.74% usable rate)

**Table 1.1 Participants' status at the University**

Status	Frequency	%
Undergraduate student	262	52.1
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**Table 1.2 Demographics of Participants**

	Students (n=306)		Employees (n=194)		Overall (n=500)	
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African American	7	2.3	7	3.6	14	2.8
Native American	1	0.3	6	3.1	7	1.4
Asian/Pacific	12	3.9	4	2.1	16	3.2
Other	16	5.2	3	1.5	19	3.8
Gender						
Male	22	7.2	23	11.9	45	8.9
Female	281	91.8	170	87.6	454	90.3

	Students (n=306)		Employees (n=194)		Overall (n=500)	
	Frequency	%	Frequency	%	Frequency	%
Gender Diverse	1	0.3	1	0.5	2	0.4
Prefer not to answer	2	0.7	0	0.0	2	0.4
Children						
Yes	33	10.8	152	78.4	187	37.2
No	273	89.2	42	21.6	316	62.8
Age	M=23.00, SD=5.82		M=41.36, D=11.97		M=29.93, D=12.40	

**Table 2 Frequencies of Attitude Scale** (higher score indicated positive)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I would be comfortable if a mother were to breastfeed in public, such as at work or in a restaurant.	279 (55.6%)	161 (32.1%)	27 (5.4%)	27 (5.4%)	8 (1.6%)
Mothers should take measures to cover themselves when breastfeeding in public.	67 (13.3%)	167 (33.3%)	129 (25.7%)	79 (15.7%)	60 (12.0%)
Mothers should avoid breastfeeding in public.	14 (2.8%)	15 (3.0%)	42 (8.3%)	148 (29.4%)	284 (56.5%)
In my culture, breastfeeding in public is considered normal.	47 (9.4%)	133 (26.5%)	146 (29.1%)	151 (30.1%)	25 (5.0%)
I would feel embarrassed to see a mother breastfeed in public.	10 (2.0%)	10 (2.0%)	40 (8.0%)	163 (32.5%)	278 (55.5%)
Attitude Score	Internal Consistency Cronbach's $\alpha = .78$ M=3.96, SD=0.77				

**Table 3: Frequencies of Knowledge Scale, Campus**

	True	False	Don't Know
<b>Campus</b>			
Designated breastfeeding areas exist across campus.	234 (46.5%)	27 (5.4%)	242 (48.1%)
There are at least 13 designated breastfeeding areas on campus.	69 (13.7%)	32 (6.4%)	402 (79.9%)
Based on the State law, designated space, including employee office space, must be available on campus.	288 (57.3%)	11 (2.2%)	204 (40.6%)
A campus map of breastfeeding areas is available online.	125 (24.9%)	34 (6.8%)	244 (68.4%)
Private breastfeeding space at some university athletic events is currently offered.	210 (41.8%)	16 (3.2%)	276 (55.0%)

**Table 4: Frequencies of Benefit Choice, Duration, and Economic Benefits**

	Frequency	%
When feeding an infant less than 6 months, the most beneficial choice is:		
Partial breastfeeding	13	2.6
Predominant or mostly breastfeeding	189	37.6
Exclusive or only breastfeeding	228	45.3
No breastfeeding	1	0.2

	Frequency	%
I don't know	72	14.3
Which of the following is an adequate duration for breastfeeding?		
Until baby is 6 months old	97	19.3
Until baby is 12 months old	228	47.4
Until baby is 18 months old and beyond	89	17.7
I don't know	78	15.5
Which of the following is true regarding breastfeeding and economic benefits?		
It has been estimated that the U.S. economy could save over \$10 billion per year in pediatric health cost, if 90% of women breastfed for the first year of life.	229	45.7
There is little evidence that healthcare costs would change if the majority of mothers breastfed in the U.S.	30	6.0
I don't know.	242	48.3

**Table 5: Frequencies of Knowledge Scale, Law**

	True	False	Don't Know
<b>State Law</b>			
Your employer is legally required to give you break time to breastfeed, but this break time may not be paid in all workplaces.	267 (53.1%)	14 (2.8%)	222 (44.1%)
Your employer is legally required to make a reasonable effort to provide a clean, secure, and private area to breastfeed apart from the bathroom stall.	282 (56.1%)	23 (4.6%)	298 (39.4%)
A woman has the legal right to breastfeed in public.	338 (67.2%)	11 (2.2%)	154 (30.6%)
Before taking this survey, I was aware there are laws related to breastfeeding in the State of Arkansas.	234 (46.6%)	198 (39.4%)	70 (13.9%)
<b>Federal Law</b>			
The federal law “Break time for nursing mother’s provision” states break time to express breast milk be provided to an employee, up to 1 year after the child’s birth.	159 (31.7%)	2 (0.4%)	341 (67.9%)
<b>Personal Attitude</b>	Agree	Disagree	Don't Know
A woman has the ethical right to breastfeed in public.	471 (93.8%)	12 (2.4%)	19 (3.8%)
Breastfeeding laws matter to me.	438 (87.8%)	31 (6.2%)	30 (6.0%)

**Table 6: Frequencies of Perception Scale (higher score indicated positive)**

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The benefits of breastfeeding last only as long as the baby is breastfed.	16 (3.2%)	22 (4.4%)	50 (10.0%)	224 (44.6%)	190 (37.8%)
Breastfeeding increases mother-infant bonding.	349 (69.5%)	128 (25.5%)	16 (3.2%)	4 (0.8%)	5 (1.0%)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Formula feeding is more convenient than breastfeeding.	35 (7.0%)	117 (23.3%)	184 (36.7%)	108 (21.5%)	58 (11.6%)
Breastmilk is lacking in iron.	2 (0.4%)	35 (7.0%)	214 (42.7%)	172 (34.3%)	78 (15.6%)
Formula fed babies are more likely to be overfed than breastfed babies.	42 (8.3%)	156 (31.0%)	205 (40.8%)	81 (16.1%)	19 (3.8%)
Breast milk is cheaper than formula.	271 (53.9%)	165 (32.8%)	39 (7.8%)	14 (2.8%)	14 (2.8%)
Formula feeding is the better choice if the mother plans to go back to work.	10 (2.0%)	55 (11.0%)	153 (30.5%)	187 (37.3%)	97 (19.3%)
Mothers who formula feed miss one of the great joys of motherhood.	42 (8.4%)	105 (20.9%)	119 (23.7%)	145 (38.9%)	92 (18.1%)
Breastfed babies are healthier than formula fed babies.	81 (16.2%)	145 (28.9%)	158 (31.5%)	89 (17.8%)	28 (5.6%)
Breastfed babies are more likely to be overfed than formula fed babies.	4 (0.8%)	8 (1.6%)	187 (37.3%)	216 (43.0%)	87 (17.3%)
Fathers feel left out if a mother breastfeeds.	5 (1.0%)	56 (11.1%)	94 (18.7%)	213 (42.3%)	135 (26.8%)
Breast milk is the ideal food for babies.	210 (42.0%)	184 (36.8%)	84 (16.8%)	20 (4.0%)	2 (0.4%)
Breast milk is more easily digested than formula.	180 (35.9%)	153 (30.5%)	145 (28.9%)	20 (4.0%)	4 (0.8%)
Formula is as healthy for an infant as breast milk.	26 (5.2%)	139 (27.6%)	157 (31.2%)	127 (25.2%)	54 (10.7%)
Breastfeeding is more convenient than formula.	94 (18.7%)	123 (24.5%)	157 (31.2%)	116 (23.1%)	13 (2.6%)
A mother who occasionally drinks alcohol should not breastfeed her baby.	61 (12.2%)	93 (18.6%)	96 (19.2%)	179 (35.7%)	72 (14.4%)
Perception Score	Internal Consistency Cronbach's $\alpha = .80$ M=3.62, SD=0.50				

**Table 7: Frequencies of Economic Benefits**

	Frequency	%
Which of the following is true regarding breastfeeding and economic benefits?		
It has been estimated that the U.S. economy could save over \$10 billion per year in pediatric health cost, if 90% of women breastfed for the first year of life.	229	45.7
There is little evidence that healthcare costs would change if the majority of mothers breastfed in the U.S.	30	6.0
I don't know.	242	48.3

## Discussion

### Findings

The survey was primarily taken by those who identified as White, female, and undergraduate students. Overall, our respondents had a positive view towards breastfeeding as evidenced by high scores on the IIFAS section of the survey, and a low score on the BBQ section. No outliers exist in this study as we did not use a continuous scale. It should be noted that this study was also conducted at Auburn University in Auburn, Alabama with no significant differences between the two demographically similar populations.

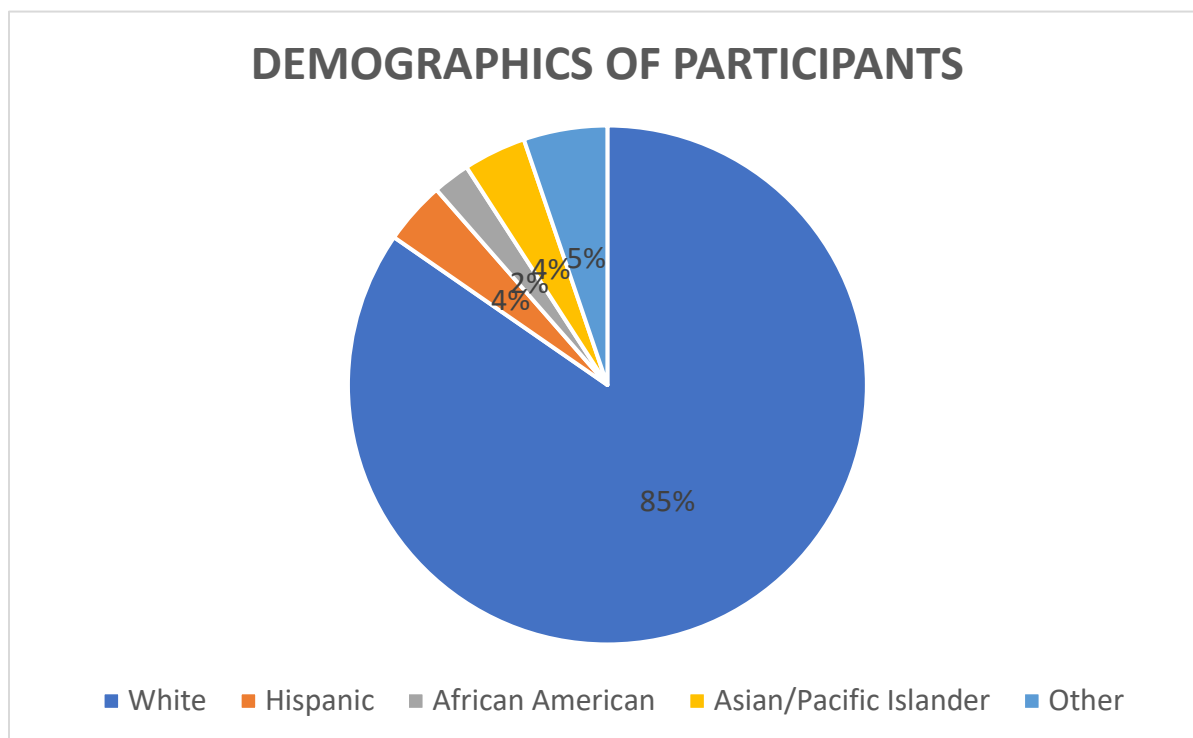


Figure 1: Demographics of Participants (Table 1.2).

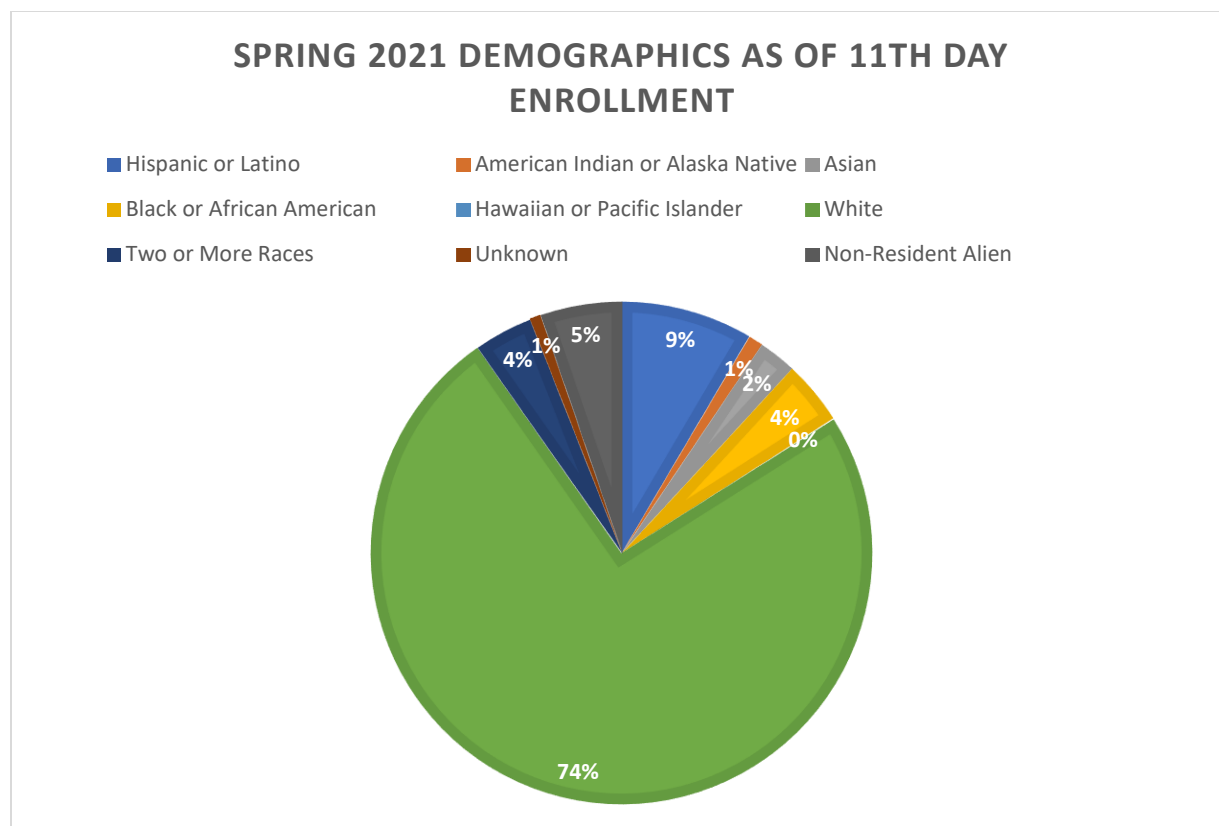


Figure 2: Spring 2021 Demographics as of 11th Day Enrollment (UofA, 2021).

## Limitations

One of the limitations of the survey is that it yielded an 80.74% usable rate of responses. To determine the usable rate, entire empty surveys were deleted to get the returned responses. From those returned responses, those who did not complete at least 90% of survey questions were excluded to reach the usable survey. Hence, the usable rate is based on the ratio of usable survey to returned responses. This decreased our sample size which decreases the power of the study as it leads to higher variability and can be subject to increased bias. I believe participants did not complete the survey due to its length, although measures were taken to make the survey more visually appealing and seemingly short for the user. The estimated time for completion of the survey was only 5 minutes as calculated by Qualtrics. While it would have been ideal to have larger sample size, my team and myself utilized all of our networks and resources to access as

much of our target population as possible. Another limitation of the survey is the narrow demographic scope, primarily encompassing White females. This may be due to the nature of the study being inherently more appealing to women than men as breastfeeding is primarily a female health concern. This may also be due in part to the University being comprised of majority white students. This was a convenience sample and although education major information was not assessed, many nursing students were targeted to complete the survey. This could have affected knowledge for some participants, as breastfeeding content is covered in the undergraduate BSN curriculum. Those who chose to take the survey (such as fellow nursing students and sorority members) may have had an interest in breastfeeding, creating bias. This limitation poses a high likelihood for bias and unintentionally excludes others. It would be difficult to generalize the information of this study to other campus populations that may differ in demographics and geographic location, where breastfeeding rates may be higher or lower. Another limitation of the study is due to the design itself. Due to it being a cross-sectional study, the data reflects one point in time. Cross-sectional studies create prevalence-incidence bias, otherwise known as Neyman bias, where the study may have produced different results if taken at another point in time (Levin, 2006).

## **Conclusions**

While there is general awareness of the benefits of breastfeeding, the details specific to exclusive breastfeeding for at least 6 months, which is critical to ensure maximum benefit, is lacking amongst the college population. Furthermore, there is a knowledge deficit regarding the laws which protect mothers right to breastfeed in public on a national and state level. Although there appears to be a positive attitude toward breastfeeding in public, a closer analysis reveals a

need for normalization and suggests that stigma, shame and sexualization of breastfeeding still exist in this population. Respondents were largely unaware of the resources provided to them by the University of Arkansas and how to access them. Further research should be conducted due to the study's small sample size and other limitations. It is my hope that the results of this study illustrate the need for increased education, awareness and accessibility for breastfeeding mothers on college campuses and that it may be used to expand the Tiny Tusk program at the University of Arkansas or any other initiative that advocates for women's' health and wellness. It is recommended that the University of Arkansas focus education on targeting the undergraduate population aged 18-24 using social media, such as expanding the Tiny Tusk Instagram platform. It is also recommended that the University improves lactation space visibility on campus and online. This can be achieved by increasing signage on campus at current lactation spaces and amending the interactive map platform online. To view the lactation spaces icon on the University map as its currently formatted, you must click two other buttons before you see that option. Additionally, each lactation space has its own caveats. For example, the Gearheart lactation space has limited hours. The lactation space in the Bell Engineering building requires a key from another section of the building, which can only be obtained if a specific staff member is in office. These barriers make it difficult for University of Arkansas faculty, staff, students, and visitors to access these spaces on a reliable basis and discourages breastfeeding on campus. These spaces must have improved signage, be open to the public and operate at a regular schedule.

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## Appendix

### Appendix A: Consent and Survey Tool

#### Breastfeeding Survey

#### Start of Block: Default Question Block

#### Breastfeeding in Public: Knowledge and Perceptions on a University Campus

**INVITATION TO PARTICIPATE** You are invited to participate in a research study about knowledge and perceptions of breastfeeding on a university campus. *What is the purpose of this research study?* The purpose of this study is to assess differences and changes in knowledge and perceptions of breastfeeding among students, faculty and staff at two large public university campus settings. This study is being conducted by Dr. Allison Scott, Dr. Ann Lambert and Jessica Weiss, BSN honor student. *Participation is voluntary* Completion of the survey implies consent to participate in this study. You will complete the survey online through Qualtrics. The survey will take approximately 10 to 12 minutes to complete. *What are the possible risks or discomforts?* There are no anticipated risks or discomforts from participation. *What are the possible benefits of this study?* A self-assessment of your knowledge and attitudes could provide information to help improve campus awareness of breastfeeding knowledge, protective laws, and campus lactation resources. *Will I receive compensation for my time if I choose to participate in this study?* If you complete the survey and wish to be in a drawing for ten \$50 Amazon gift cards, you can supply your email address at the end of the survey. All email addresses will be placed in a separate word document and a drawing held at the end of the survey collection period. Emails will be de-identified from the survey, for the drawing. *What are the options*

*if I do not want to be in the study?* If you do not want to be in this study, you may choose not to complete the survey. *How will my confidentiality be protected?* All information will be kept confidential to the extent allowed by and applicable to University policy, State and Federal law. Your information will be assigned a code number, unique to this study; your name is not required. The data from the surveys will be stored in Qualtrics, a secured password-protected research software program at the University of Arkansas, for data analysis and management. Data will be analyzed and reported as aggregate results. If you have questions or concerns about this study, you may contact Dr. Allison Scott (als002@uark.edu) at (479) 575-3904 or by e-mail. For questions or concerns about your rights as a research participant, please contact Ro Windwalker, the University's IRB Coordinator, at (479) 575-2208 or by e-mail at irb@uark.edu. I have read the above statement and have been able to ask questions and express concerns, which have been satisfactorily responded to by the investigator. I understand the purpose of the study as well as the potential benefits and risks that are involved. I understand that participation is voluntary. I understand that significant new findings as a result of this research will be shared with participants upon request. I have been given a copy of the consent form. Completion of the survey implies consent to participate in this research.

**Page Break**

Please rate the extent to which you agree or disagree with the following statements.

	Strongly Agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly Disagree (5)
I would be comfortable if a mother were to breastfeed in public, such as at work or in a restaurant.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(1)					
Mothers should take measures to cover themselves when breastfeeding in public. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(2)					
Mothers should avoid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**breastfeeding**

**in public. (3)**

**In my**

☐
☐
☐
☐
☐

**culture,**

**breastfeeding**

**in public is**

**considered**

**normal. (4)**

**I would feel**

☐
☐
☐
☐
☐

**embarrassed**

**to see a**

**mother**

**breastfeed in**

**public. (5)**

**Please rate the extent to which you agree or disagree with the following statements.**

**Strongly**

**Agree (2)**

**Neither**

**Disagree (4)**

**Strongly**

**agree (1)**

**agree nor**

**disagree (5)**

**disagree (3)**

**The benefits  
of**

☐☐☐☐☐

**breastfeeding**

**last only as**

**long as the**

**baby is**

**breastfed. (1)**

**Breastfeeding**

☐☐☐☐☐

**increases**

**mother-infant**

**bonding. (2)**

**Formula**

☐☐☐☐☐

**feeding is**

**more**

**convenient**

**than**

**breastfeeding.**

**(3)**

**Breast milk is**

☐☐☐☐☐

**lacking in**

**iron. (4)**

**Formula fed**

☐☐☐☐☐

**babies are**

**more likely to**

**be overfed**

**than**

**breastfed**

**babies. (5)**

**Breast milk is**

**cheaper than**

**formula. (6)**

**Formula**

**feeding is the**

**better choice**

**if the mother**

**plans to go**

**back to work.**

**(7)**

**Mothers who**

**formula feed**

**miss one of**

**the great joys**

**of**

**motherhood.**

**(8)**



**Breastfed  
babies are  
healthier than  
formula fed  
babies. (9)**

☐☐☐☐☐

**Breastfed  
babies are  
more likely to  
be overfed  
than formula  
fed babies.**

☐☐☐☐☐

**(10)**

**Fathers feel  
left out if a  
mother  
breastfeeds.**

☐☐☐☐☐

**(11)**

**Breast milk is  
the ideal food  
for babies.**

☐☐☐☐☐

**(12)**

**Breast milk is  
more easily**

☐☐☐☐☐

**digested than  
formula. (13)**

**Formula is as  
healthy for an  
infant as  
breast milk.**

☐☐☐☐☐

**(14)**

**Breastfeeding  
is more  
convenient  
than formula.**

☐☐☐☐☐

**(15)**

**Breast milk is  
cheaper than  
formula. (16)**

☐☐☐☐☐

**A mother  
who**

☐☐☐☐☐

**occasionally  
drinks**

**alcohol**

**should not**

**breastfeed**

**her baby. (17)**

Please respond to the following statements based on your knowledge of your college campus.

	True (1)	False (2)	I don't know (3)
Designated breastfeeding areas exist across campus. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are at least 13 designated breastfeeding areas on campus. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Based on the State law, designated space, including employee office space, must be available on campus. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

A campus map of  
breastfeeding areas  
is available online.

☐
☐
☐

(4)

Private  
breastfeeding space  
at some university  
athletic events is  
currently offered.

☐
☐
☐

(5)

Please respond to the following statements based on your knowledge of laws in the state of  
Arkansas.

True (1)

False (2)

I don't know (3)

Your employer is  
legally required to  
give you break time  
to breastfeed, but  
this break time may

☐
☐
☐

**not be paid in all  
workplaces. (1)**

**Your employer is  
legally required to  
make a reasonable  
effort to provide a  
clean, secure, and  
private area to  
breastfeed apart  
from the bathroom  
stall. (2)**

**A woman has the  
legal right to  
breastfeed in public.  
(3)**

**Before taking this  
survey, I was aware  
there are laws  
related to  
breastfeeding in the  
state of Arkansas.**

**(4)**

**Please respond to the following statements based on your personal attitude.**

	<b>Agree (1)</b>	<b>Disagree (2)</b>	<b>I don't know (3)</b>
<b>A woman has the ethical right to breastfeed in public.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>(1)</b>			
<b>Breastfeeding laws matter to me. (2)</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**True or false: The Federal law “Break Time for Nursing Mother’s Provision” states break time to express breast milk be provided to an employee, up to 1 year after the child’s birth.**

- ☐ **True (1)**
- ☐ **False (2)**
- ☐ **I don't know (3)**

**When feeding an infant less than 6 months, the most beneficial choice is**

- ☐ **Partial breastfeeding (1)**
- ☐ **Predominant or mostly breastfeeding (2)**
- ☐ **Exclusive or only breastfeeding (3)**
- ☐ **No breastfeeding (4)**
- ☐ **I don't know (5)**

**Which of the following is an adequate duration of breastfeeding?**

- ☐ **Until the baby is 6 months old (1)**
- ☐ **Until the baby is 12 months old (2)**
- ☐ **Until the baby is 18 months old and beyond (3)**
- ☐ **I don't know (4)**

**Which of the following is true regarding breastfeeding and economic benefits?**

- ☐ **It has been estimated that the U.S. economy could save over \$10 billion per year in pediatric health cost, if 90% of women breastfed for the first year of life. (1)**
- ☐ **There is little evidence that healthcare costs would change if the majority of mothers breastfed in the U.S. (2)**
- ☐ **I don't know (3)**

**Please select your status at the university**

- ☐ **Undergraduate Student (1)**
- ☐ **Graduate Student (2)**
- ☐ **Faculty (3)**
- ☐ **Administrative Support/Staff (4)**
- ☐ **Other university employee (5)**

**Please select your gender**

- ☐ **Male (1)**
- ☐ **Female (2)**
- ☐ **Gender diverse (3)**
- ☐ **Prefer not to answer (4)**

**What is your ethnicity?**

- ☐ **White (1)**

- ☐ **Hispanic or Latino (2)**
- ☐ **Black or African American (3)**
- ☐ **Native American or American Indian (4)**
- ☐ **Asian or Pacific Islander (5)**
- ☐ **Other (6)**

**Do you have children?**

- ☐ **Yes (1)**
- ☐ **No (2)**

**How old are you (in years)?**

---

**If you wish to be entered in the drawing for one of ten, \$50 Amazon gift cards, please enter your email address here:**

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**End of Block: Default Question Block**