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Breastfeeding Knowledge, Attitudes, Previous Exposure and Future Intention of Undergraduate Students in Honduras

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To the Graduate Council:

I am submitting herewith a thesis written by Mariana Rendon entitled "Breastfeeding Knowledge, Attitudes, Previous Exposure and Future Intention of Undergraduate Students in Honduras." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Nutrition.

Katherine F. Kavanagh, Major Professor

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Breastfeeding Knowledge, Attitudes, Previous Exposure and Future Intention of Undergraduate Students in Honduras

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Mariana Rendon
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To Mamá, Papá, Mario, Luis, and Dushyant,
Thank you for your unconditional love and support.
You are my world.

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ABSTRACT

Background: In Honduras, over 95% of mothers initiate breastfeeding but less than a third meet the World Health Organization recommendation to exclusively breastfeed through 6 months. Understanding the breastfeeding knowledge, attitudes, prior exposure and future intent of young adults may provide significant insight into the relatively low exclusivity rates reported in the Honduran population and may be important targets for future interventions in this population. To the authors' knowledge, this is the first study to explore these concepts among young adults in Honduras.

Objective: The objective of this study was to describe, identify, and explore any relationships between demographics, breastfeeding knowledge, attitudes, prior exposure, and future breastfeeding intent in a sample of undergraduate students in Honduras.

Methods: This was an exploratory, cross-sectional study, conducted with a convenience sample of 283 undergraduate students attending a major public university in Honduras in February 2015.

Results: Honduran undergraduate students have moderate breastfeeding knowledge, neutral breastfeeding attitudes, high prior breastfeeding exposure, and high intention to breastfeed or support their partners to breastfeed in the future. Knowledge on the health benefits of breastfeeding was low. Less than a third of students knew that women who have breastfed have a lower risk of breast cancer (28.8%) and only 47.9% knew that breastfeeding helps prevent respiratory infections in the infant. Slightly over half of students considered breastfeeding in public to be acceptable (53.4%) and less than a third reported that seeing a woman breastfeeding in public would make them uncomfortable (28.2%). Over three-fourths of students (82.0%) expressed an intention to breastfeed or support a partner to breastfeed in the future, though

female students were more likely to report this intention than male students (88.8% vs. 74.4%, $p<0.05$).

Conclusion: Due to the high breastfeeding initiation and duration rates in Honduras, the finding that students reported a high level of prior breastfeeding exposure and future breastfeeding intent, was not particularly surprising. However, future research is needed to explore the moderate breastfeeding knowledge and neutral breastfeeding attitudes among young adults in Honduras to support the maintenance of the current breastfeeding initiation and duration rates and increase breastfeeding exclusivity rates.

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CHAPTER I. LITERATURE REVIEW

Benefits of Breastfeeding

The short-term and long-term benefits of breastfeeding for infants, mothers and the community have been widely acknowledged and documented throughout the literature, with evidence that many of these benefits increase with breastfeeding exclusivity and duration.[1-3] For the purpose of this paper, breastfeeding duration refers to the length of time infants are breastfed, including breastfeeding through the initial stage of exclusive breastfeeding and any period of complementary feeding until weaning.[4] Exclusive breastfeeding refers to an infant receiving only breastmilk and no other liquids or solids, not even water, with the exception of oral rehydration solution, drops or syrups consisting of vitamin minerals or medicines.[4, 5]

Benefits for Infants

Breastfeeding is widely recognized as the means of providing infants with the optimal source of nutrition during the first six months of life.[2, 3, 6] Breast milk is uniquely tailored to meet the nutritional needs of infants for healthy growth and development.[2, 6] For infants, breastfeeding has been associated with a decreased incidence and/or severity of bacterial meningitis, diarrhea, respiratory tract infections, necrotizing enterocolitis, acute otitis media, atopic dermatitis, gastrointestinal tract infections, and sudden-infant death syndrome (SIDS).[3, 6-10] Also, breastfeeding has been associated with a decreased incidence of asthma, celiac disease, childhood obesity, inflammatory bowel disease, diabetes, and childhood leukemia and lymphoma.[2, 3, 6, 10]

Benefits for Mothers

The benefits of breastfeeding are not limited to the infant, as breastfeeding is linked to positive maternal health outcomes.[3, 6, 10, 11] For example, women who breastfeed have a reduced risk of postpartum hemorrhage, postpartum depression, rheumatoid arthritis, type II diabetes,

cardiovascular disease, hip fractures and osteoporosis in the postmenopausal period and breast and ovarian cancer. Breastfeeding also has a positive effect on early maternal-infant bonding.[12] In addition, Ball and Wright estimated that families who followed recommended breastfeeding practices could save more than $1200 in infant formula expenses during the first year alone (based on pre-1999 costs).[13]

Benefits for the Community

In addition to the benefits for mothers and infants, there are communal economic and environmental benefits associated with breastfeeding.[2, 10, 14-16] A 2001 study concluded that a minimum of $3.6 billion could be saved annually in health care costs in the United States if breastfeeding rates increased to those recommended by the United States Surgeon General, due to a reduction of otitis media, gastroenteritis and Necrotizing enterocolitis cases.[15] More recently, Bartick and Reinhold's cost-analysis study determined that if 90% of United States families followed the recommendation to breastfeed exclusively for six months, the United States would save $13 billion per year.[16] Additional economic benefits include fewer health insurance claims due to better infant health and lower employee absenteeism and turnover rates.[2, 10, 14] Breastfeeding also has a lower environmental impact than infant formula as it produces less pollution and does not require packaging and transportation.[2]

Breastfeeding Recommendations

As a result of these findings, national and international organizations such as the World Health Organization (WHO), the United Nations Children's Emergency Fund (UNICEF), the American Academy of Pediatrics (AAP), the American College of Obstetrics and Gynecology (ACOG), the Academy of Nutrition and Dietetics (The Academy), and the American Public Health Association (APHA) recommend exclusive breastfeeding for the first 6 months of an

infant's life.[2, 6, 10, 17-19] Afterward, the AAP recommends breastfeeding continue for at least 12 months or as long as desired by mother and infant with the introduction of complimentary foods at 6 months.[6, 10] The WHO, with its focus on global populations, recommends breastfeeding continue to 2 years or beyond.[19]

Breastfeeding Trends

Up until the 19th century, nearly all children were breastfed, regardless of culture, country, or economic status.[20] If a mother died or was unable to breastfeed because of illness or work the alternative was to look for another woman to breastfeed the child.[20] Breastfeeding was the norm; and the solution to a breastfeeding problem was to look for another mother, not for another milk.[20] The onset of the Industrial Revolution resulted in an increased cost of living, which forced women to seek employment outside the home and contribute financially to their family. This made it virtually impossible for many mothers to breastfeed.[21] In the 19th century, advances in formula development, the availability of safer sources of animal milk, and improvements to the feeding bottle led to the slow but steady substitution of artificial feeding in place of wet nursing.[21]

During the early 20th century infant formula was mass produced and advertised as a convenient and nutritious alternative to breastfeeding.[22] By the 1940s and 1950s, physicians and consumers regarded the use of formula as a well-known, popular, and safe substitute for breastmilk, which led to a steady decline in breastfeeding.[20, 21, 23] In England breastfeeding rates declined from 80% in 1900 to 14% in 1960.[24] Similarly, in the United States, breastfeeding rates declined from 68% in 1915 to 17% in 1950.[25] By the 1960s, formula feeding had become a sign of modernity, freedom, sophistication, and affluence.[26, 27] As birth rates in developed countries dropped and sales of infant formula began to decline, infant formula manufacturers shifted their

attention towards developing countries where birth rates were high and where newly urbanized cities were starting to appear.[20] Consequently, the decline in breastfeeding practices, which started in developed countries, was repeated in developing countries.[28] In Mexico, for example, the proportion of six-month old infants who were breastfed declined from 100% to 9% between 1960 and 1970.[26] Throughout the 1970s, breastfeeding rates declined worldwide as a result of rapid social and economic change, including urbanization and marketing of infant formula.[23, 29]

Early in the 1990s, concern about declining rates of breastfeeding led to the development of the Baby-Friendly Hospital Initiative (BHFI) by UNICEF and WHO to facilitate breastfeeding promotion and support in maternity units.[30] In addition to the BFHI, education programs oriented towards health care providers and mothers, and regulations imposed on the marketing of infant formula facilitated an increase in breastfeeding initiation.[31, 32] Thus, in recent years, the global trend shifted towards improved breastfeeding practices.[33, 34] For example, survey data from 43 developing countries showed a significant increase in the rate of exclusive breastfeeding, from 39% to 46% between 1989 and 1999.[35] In recent years, UNICEF reported that breastfeeding initiation rates ceased to decline at a global level, yet other breastfeeding indicators (early initiation, exclusive breastfeeding, and continued breastfeeding at 1 year) remained below the recommended levels.[36] Worldwide, the percentage of infants under six months of age who are exclusively breastfed increased from 34% in 1995 to 44% in 2015.[36] Progress was greater in the least developed countries, increasing from 34% of infants 0-6 months being exclusively breastfed in 1995 to 52% in 2011.[37] In addition, in 18 countries the rates of exclusive breastfeeding increased by more than 20%.[37] In Sierra Leone for example, between 2000 and 2010, the rate of exclusive breastfeeding increased from 4% to 32%.[37] Similarly in Pakistan, between 1995 and 2007, the rate of exclusive breastfeeding more than doubled, increasing from

16% to 37%.[37] However, the latest data indicate that, worldwide, less than half of all infants are breastfed within one hour of birth (early initiation of breastfeeding), are exclusively breastfed for six months, and/or continue to breastfeed at 2 years (Figure 1.1).[36]

Barriers to Breastfeeding

Despite breastfeeding being recognized as the optimal source of infant nutrition and evidence of the benefits of breastfeeding to infants, mothers, and the community, breastfeeding rates continue to lag behind national and international objectives.[6, 37-39] Individual-, interpersonal-, institutional-, community- and social-level factors have been identified in the literature as barriers to the initiation, duration, and exclusivity of breastfeeding.[2, 40, 41]

Individual-level factors include maternal education, age, marital status, smoking status and race and ethnicity.[2, 40, 42-44] For example, a prospective study conducted in Sweden with over 30,000 mothers found that maternal education was strongly and positively associated with breastfeeding duration.[40] Furthermore, in a sample of 900 Italian mothers, Bertini and colleagues

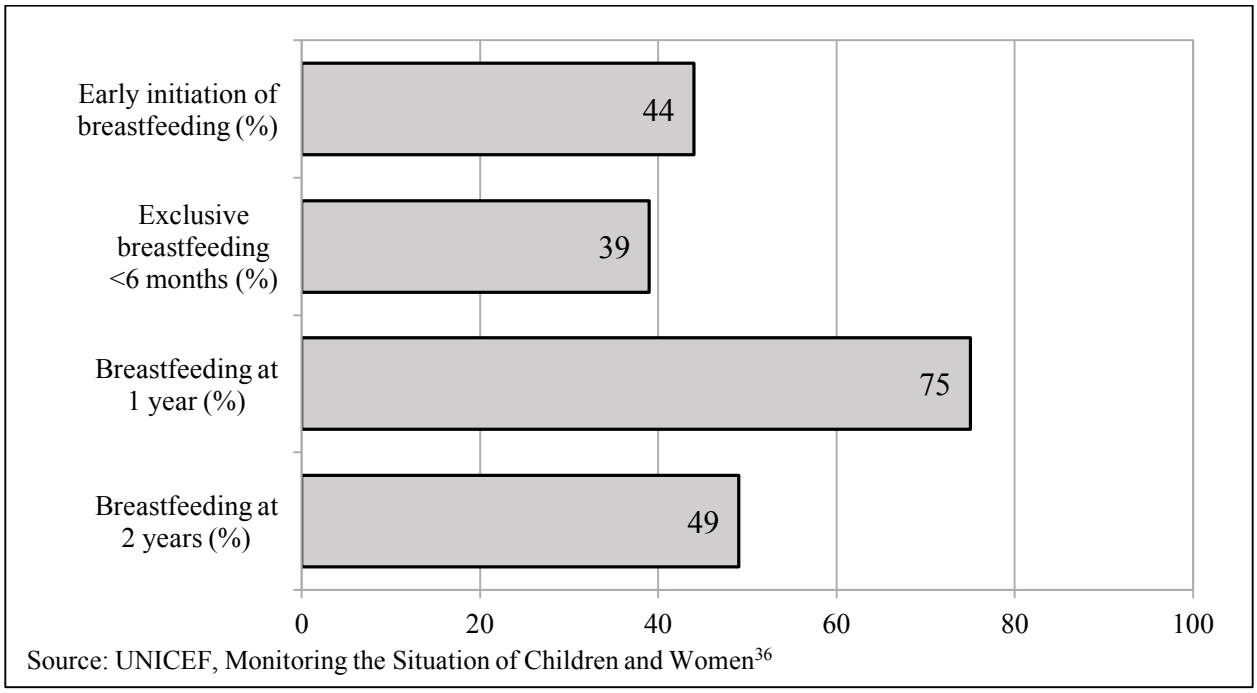

Figure 1.1. Global averages of key breastfeeding indicators (%), 2010-2015

found that mothers with a low education level (8 years or less) had a greater risk of interrupting breastfeeding at an earlier time.[43] In the United States, Lee and colleagues examined the relationship between sociodemographic factors, maternal characteristics and intention to breastfeed among 2,690 low-income, inner-city pregnant women.[42] The authors found that lower education level, not living with the infant's father and smoking were all negatively and independently associated with breastfeeding intention.[42] Moreover, McDowell, Wang and Kennedy-Stephenson examined data from the 1999-2006 United States National Health and Nutrition Examination Survey (NHANES) and found that the 'ever breastfed' rate was significantly higher for infants from higher income households compared with those from lower income households (74% vs. 57%, $p<0.05$).[44] In addition, the authors found the 'ever breastfed' rate increased significantly with increasing maternal age. The 'ever breastfed' rate of mothers under 20 years of age was lower than the 'ever breastfed' rate of mothers who were 30 years of age and older (43% vs. 75%, respectively, $p<0.05$).[44] Race was also related to breastfeeding outcomes.[2] Even after controlling for family income and educational level, the breastfeeding rates for black infants were about half that of white infants at birth, 6 months and 12 months.[2]

Interpersonal-level factors include both physical and mental support from family and friends. [45-49] Support from the infant's father has been associated with positive breastfeeding outcomes.[45-47] In a qualitative study, Rempel and colleagues interviewed twenty-one fathers to explore their role in the breastfeeding family.[46] The authors found that fathers play an important role in supporting breastfeeding by understanding, encouraging and assisting mothers to breastfeed, by valuing breastfeeding mothers, and by sharing housework and childcare.[46] In Brazil, Susin and colleagues assessed the breastfeeding knowledge of fathers and its relationship to breastfeeding duration.[47] The authors found that fathers' knowledge significantly influenced

breastfeeding rates. Infants whose fathers had higher breastfeeding knowledge were 1.76 times more likely to be exclusively breastfed at the end of the first month and 1.91 times more likely to receive breast milk at the end of the third month, compared to those with fathers with lower breastfeeding knowledge ($p<0.05$).[47] Furthermore, Tarrant and colleagues surveyed 1,417 Hong Kong mothers with the purpose of describing their breastfeeding and weaning practices and determining the factors associated with early breastfeeding cessation.[45] The authors reported that mothers whose husbands preferred breastfeeding were more likely to continue breastfeeding for over 1 month.[45] In addition, among those who were still breastfeeding after the first month, the husband's preference for infant formula was negatively associated with continued breastfeeding.[45]

Some research has identified that grandmothers may be influential in infant feeding decisions and behaviors.[48, 49] For example, Susin and colleagues examined the influence of grandmothers on breastfeeding practices in Brazil, and found that the advice from grandmothers, to add water, tea, or other foods to the infant diet, were significantly related to discontinuation of exclusive breastfeeding at 1 month postpartum and complete weaning by 6 months postpartum.[48] Similarly, Ludvigsson conducted cross-sectional interviews with Bolivian mothers to investigate the relationship between the attitudes of the mother and her family towards breastfeeding.[49] However, these authors report no evidence that the attitudes of grandmothers influenced infant feeding behavior, but state that almost all grandmothers in this study were reported to have positive attitudes toward breastfeeding, and the lack of "negative or neutral attitudes" towards breastfeeding likely diminishes the chances to link attitude to feeding behavior.[49]

Institutional factors include support for women as they return to work.[46, 48, 50-52] In the United States, between 1975 and 2005 the proportion of women in the civilian labor force with

children under the age of 3 years increased from 34.3% to 59%.[53] In 2002, 55% of mothers with an infant less than 12-months-old were in the labor force.[61] Furthermore, one-third of women returned to work within 3 months of giving birth, and two-thirds returned within 6 months.[51, 54] Despite an increase in the number of women who breastfeed after returning to work, employed mothers typically find that returning to work is a significant barrier to breastfeeding.[2] For example, in a longitudinal study on a national sample of new mothers (n=228,000) investigating maternal employment status and its impact on breastfeeding, Ryan and colleagues found that despite similar in-hospital breastfeeding rates between not employed and employed full-time mothers (64.8% and 65.5%, respectively), mothers who were not employed were more likely to initiate breastfeeding than those who were employed full time (OR=1.28, $p< 0.001$).[51] In addition, 6 months after delivery, full-time employment had a significant negative effect on breastfeeding, with only 26.1% of full-time employed mothers still breastfeeding compared to 35.0% of those who were not employed ($p<0.05$).[51] Similarly, Rivera-Pasquel and colleagues examined the association between maternal employment and breastfeeding in Mexican mothers (n=5,385) using data from National Health and Nutrition Surveys conducted in 1999, 2006 and 2012.[55] In all surveys, infants under 1 year of age were less likely to be breastfed if their mother was employed as compared to infants of unemployed mothers. For example, employed mothers were less likely to breastfeed compared to unemployed mothers at 3 months (63 vs. 70 %, in 1999; 72 vs. 78 %, in 2006; 63 vs. 70 %, in 2012, $p<.005$) and at 6 months (55 vs. 61 %, in-1999; 63 vs. 70 %, in 2006; 55 vs. 61 %, in 2012, $p<0.005$). In addition, there was a difference in median duration of breastfeeding between employed and unemployed mothers of 5.7 months in 1999, 4.7 months in-2006 and 6.7 months in 2012, respectively ($p < 0.05$).[55]

Community- and social-level factors include support for the breastfeeding mother in the workplace and policies protecting the breastfeeding dyad in public spaces.[2] To the best of the authors' knowledge limited research exists that explores public attitudes towards breastfeeding in Latin American countries. Nonetheless, breastfeeding attitudes have been explored in a few Latin American countries and with Latino populations in the United States.[56-61] For example, in an exploratory study aimed at identifying the main societal obstacles to breastfeeding in low-income communities in Tijuana, Mexico (n=127), embarrassment to breastfeed in public was ranked as the third main obstacle to breastfeeding, only after pain and perception of having an inadequate milk supply.[56] Moreover, studies with immigrant mothers in the United States have found that the rate of breastfeeding decreases with each generation in the United States and that mothers perceive bottle feeding as more acceptable in the United States than in their home countries.[57-61] For example, Harley and colleagues investigated the association between years of residence in the United States and breastfeeding practices in a population of low-income mothers of Mexican descent (n=490).[61] In this study, breastfeeding practices varied by duration in the United States, with a statistically significant trend of lower initiation rates with longer time in the United States ($p<0.001$). In addition, the rates of exclusive breastfeeding at 4 months and any breastfeeding at 6 and 12 months decreased with time residing in the United States ($p=0.03$, $p<0.001$ and $p<0.001$, respectively). Median duration of exclusive breastfeeding was 2 months for women living in the United States for 5 years or less, 1 month for women living in the United States. for 6 to 10 years, and less than one week for women living in the United States. for 11 years or more or for their entire lives. After controlling for maternal age, education, marital status and work status, lifetime residents of the United States were 2.4 times more likely to stop breastfeeding, and 1.5 times more likely to stop exclusive breastfeeding, than immigrants who had lived in the

United States for 5 years or less. Overall, if breastfeeding in public is considered embarrassing and/or unacceptable, mothers may feel compelled to breastfeed only at home, limiting their ability to comply with infant feeding recommendations, or may transition fully to formula feeding, as the more accepted feeding method.

Breastfeeding Knowledge, Attitudes, Prior Exposure and Intent

The Theory of Planned Behavior (TPB), illustrated in Figure 1.2, postulates that an individual's intention to perform a behavior is a strong predictor of actual behavior.[62] Intention is the result of an individual's attitude, subjective norms and perceived behavioral control. Attitude refers to an individual's perception of a behavior or the degree to which they have a positive or negative evaluation of a behavior. Subjective norms refer to the perceived social pressure to perform or not perform a behavior. Perceived behavioral control refers to the perceived ease or difficulty of performing a behavior. It is assumed to reflect past experiences as well as anticipated impediments and obstacles. Overall, the more favorable the attitude and subjective norm with respect to a behavior, the greater the perceived behavioral control and the stronger an individual's intention to perform a behavior.[62] In the context of breastfeeding, the TPB proposes that breastfeeding behavior is determined by breastfeeding intention, and intention is shaped by the combination of (1) maternal attitudes towards breastfeeding, (2) attitudes expressed by a mother's significant others and (3) maternal perceptions of behavioral control or her perceived ability to breastfeed.[63, 64]

Breastfeeding knowledge and attitudes have been shown to impact breastfeeding behavior via intention.[47, 65-67] Susin and colleagues examined the influence of parental breastfeeding knowledge on breastfeeding rates in Brazil.[47] The authors found that mothers with the highest level of knowledge were 6.5 times more likely to exclusively breastfeed at the end of

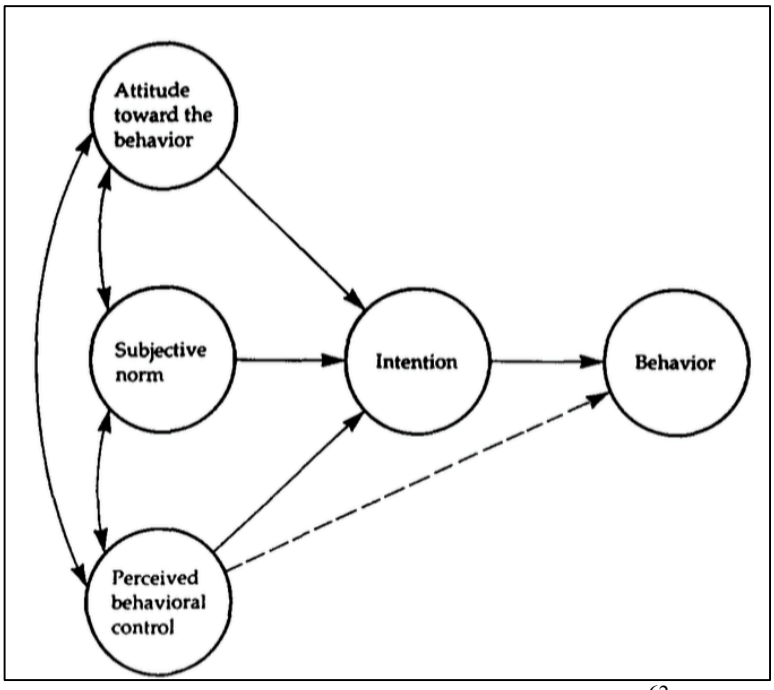

Figure 1.2. Theory of Planned Behavior[62]

the third month, and 1.97 times more likely to report any breastfeeding at the end of sixth months, compared to other mothers.[47] Scott and colleagues compared the infant feeding attitudes of 108 expectant couples during early pregnancy and their infant feeding method at discharge from the hospital.[66] Using the Iowa Infant Feeding Attitude Scale (IIFAS) the authors report that breastfeeding mothers had significantly higher total attitude scores, favoring breastfeeding, when compared with mothers who chose to formula-feed (65.0 ± 8.3 vs. 55.1 ± 7.9, $p < 0.001$).[66] In addition, in this study, maternal, but not paternal, intended method of feeding was predictive of actual method of feeding at discharge from the hospital (OR = 1.16).[66] Moreover, Avery and colleagues examined the variables that could differentiate between women who weaned during the first 4 weeks postpartum from those who weaned later on.[67] In this study, women who weaned earlier had more positive attitudes towards bottle feeding rather than breastfeeding, had intended to breastfeed for less time and had lower knowledge scores than women who weaned later.[67] Previous research has also shown that breastfeeding intention is a strong predictor of

breastfeeding duration.[65, 68] For example, in a longitudinal study of 300 Australian women, Blyth and colleagues found that women who intended to breastfeed for longer than 12 months were 2.4 times more likely to continue breastfeeding at four months compared to women who intended to breastfeed for less than six months (87.5% vs. 35.7,$p< 0.001$).[68]

Exposure to breastfeeding, either because one was breastfed, or through interactions with a breastfeeding dyad has also been linked to increased likelihood of breastfeeding intent.[69-71] For example, Murimi and colleagues explored the factors that influence the breastfeeding decision of participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in central Louisiana, and found that mothers who were breastfed as children were more likely to breastfeed their own child, compared to those who were not breastfed as children ($p<0.022$).[70] In addition, previous research also indicates that breastfeeding intention is often formed prenatally, possibly as early as the adolescent period.[72] Therefore, understanding the breastfeeding knowledge, attitudes, prior exposures, and intent of future parents may positively impact breastfeeding trends.

Breastfeeding Knowledge, Attitudes, Prior Exposure and Intent in Undergraduate Students

Globally, a handful of studies have explored the breastfeeding knowledge, attitudes, prior exposure and intent of young adults, particularly undergraduate students.[73-85] The following section will review and summarize the previous work. A summary of the findings presented below can be found in table format in **Appendix A.** For context, when available, national breastfeeding trends for each country are reviewed prior to presenting country-specific data from studies with young adults.

Hong Kong

In Hong Kong breastfeeding rates are low when compared to other developed countries and formula feeding has become the norm.[86, 87] In 2006, although 69% of mothers initiated breastfeeding, less than 20% of infants received breast milk for longer than 3 months, and less than 15% of mothers were exclusive breastfeeding at 6 months.[88] This indicates that despite mothers in Hong Kong choosing to breastfeed their infants, the rates of exclusive breastfeeding and breastfeeding duration remain below the WHO recommendations.[88]

In 2004, Tarrant and Dodgson explored the relationship between infant feeding knowledge, attitudes, previous breastfeeding exposures, and future infant feeding intentions among students at a large public university in Hong Kong.[73] Using a descriptive, cross-sectional survey the authors found that among the 403 respondents less than a third (30.3%) reported being breastfed as an infant, almost two thirds (61.4%) knew someone who had breastfed, and almost half (47.8%) had witnessed a woman breastfeeding, indicating a low exposure to breastfeeding. Almost two-thirds of respondents (63%) reported wanting their future child to be breastfed, with no significant differences detected by gender (66% male vs. 59.8% female, p=0.2). Most respondents were aware that breastfeeding helps prevent infections (80.8%), that breastfeeding is healthier than infant formula (71%), that the ability to breastfeed is unrelated to breast size (96.5%), that there is a difference between breast milk, cow's milk and soy milk (94.8%) and that breastfeeding should be started as soon as possible after birth (90.3%). However, although respondents were knowledgeable about the health benefits of breastfeeding, only 49.5% believed that formula-fed infants have more illnesses than breastfed infants. Overall, with a mean infant feeding knowledge score of 71.1% (SD= 13.3), respondents had a relatively high knowledge level, with no significant differences detected by gender (71.0% male vs. 71.1% female, p=

0.99). Moreover, most respondents reported respect for women who breastfeed and agreed that breastfeeding helps a mother feel closer to her baby (99.5% and 99%, respectively). Almost two-thirds of respondents (61.2%) reported that breastfeeding in public was an acceptable practice but over 80% believed that it would be embarrassing. Formula feeding was perceived as more convenient (71.1%) and providing more freedom to the mother (77.4%). In addition, 70.1% of respondents believed that breastfeeding and formula feeding benefit the infant equally. Overall, with a mean attitude score toward infant feeding of 2.62 ± 0.25, out of a possible 3.50, respondents' attitudes toward infant feeding were positive with no significant differences detected by gender (2.64 male vs. 2.60 female, $p=0.07$). In this population of undergraduates, the Pearson correlation between infant feeding knowledge and breastfeeding attitudes was 0.498 ($p<0.001$), indicating a moderate positive correlation. Further analysis revealed that respondents who intended to breastfeed and those with higher levels of breastfeeding exposure had significantly higher breastfeeding knowledge ($p<0.001$ and $p=0.01$, respectively) and attitudes ($p<0.001$ and $p<0.01$, respectively). In addition, there was a significant and linear relationship between the overall number of breastfeeding exposures and future intention to breastfeed ($\chi=24.93$; $p=<0.001$). Lastly, a multiple logistic regression analysis identified respondents' attitudes (OR= 1.32; $p< 0.001$), participant's own breastfeeding status (OR = 3.16; $p<0.001$) and knowing someone who had breastfed (OR=1.77; $p=0.04$) as factors independently and positively associated with future breastfeeding intention. The findings of this study suggest that despite Hong Kongese students reporting high knowledge and positive attitudes towards breastfeeding, breastfeeding was perceived as inconvenient, embarrassing and restrictive of the mother's freedom. Furthermore, consistent with previous findings, prior exposure to breastfeeding was

significantly associated with higher levels of knowledge and attitudes and with future intention to breastfeed.

Korea

Traditionally, Korean culture has accepted breastfeeding as the normal and healthy way of infant feeding.[89] However, with the adoption of the Western way of formula feeding, the breastfeeding initiation rate in Korea started to decline, falling from 95% in 1961 to its lowest level (10.2%) in 2000. [89, 90] Breastfeeding initiation rates have since increased to 16.5% in 2003 and 24.2% in 2006.[90] Nonetheless, results from a 2002 survey show that breastfeeding rates decrease rapidly over the first year of life, from 57%, to 40%, and 33%, respectively, for infants aged 1, 3, and 6 months of age.[91] Overall, despite increases in recent years, Korea's breastfeeding initiation rate is lower than that of other developed countries.

In a cross-sectional, comparative study, in 2003, Kang and colleagues explored the breastfeeding knowledge and attitudes of Korean undergraduate students.[74] In a sample of 341 undergraduate students, respondents answered 27.9% of the questions on breastfeeding knowledge correctly, with the highest scores on questions assessing the benefits of breastfeeding and the lowest scores on questions assessing the expression and storage of breast milk. Overall, respondents' breastfeeding knowledge was low, with a mean knowledge score of 17.16 ± 5.74, out of a possible 56 points, and with female respondents scoring significantly higher than male participants (17.62 ± 5.21 vs. 16.46 ± 6.40, $p<0.05$). Further, when separated by field of study, students in health-related fields had significantly higher knowledge scores than students in non-health related fields (18.41 ± 6.69 vs. 16.61 ± 5.32, $p<0.01$). Again, despite the finding of significant differences, the overall knowledge in this sample was low.

In general, with a mean attitude score of 29.8 ± 4.32 out of a possible 40 points respondents reported positive attitudes toward breastfeeding, with female students reporting more positive attitudes than male students (30.23 ± 3.81 vs. 29.17 ± 4.93, $p<0.05$). There were no significant differences in attitude scores between students in health-related fields and students in non-health related fields ($p=0.131$). Over three-fourths of respondents (76.5%) reported no previous exposure to breastfeeding but there were no significant differences in breastfeeding knowledge and attitude scores due to previous exposure to breastfeeding ($p=0.753$ and $p=0.606$, respectively). Overall, in this population, there was a significant positive correlation between respondents' knowledge and attitude scores ($r=0.318$, $p<0.01$). These findings reveal that, despite their low level of knowledge, Korean undergraduate students have positive attitudes toward breastfeeding and female students report slightly higher knowledge and somewhat more positive attitudes than male students. These findings agree with those reported in previous studies conducted with adolescent populations on gender differences in breastfeeding attitudes.[92-94]

China

In Mainland China the breastfeeding initiation rate is high (>90%) but traditional practices and an increase in the popularity of infant formula threaten exclusivity and duration.[95-99] In 2012, in an exploratory cross-sectional study, Lou and colleagues assessed the breastfeeding knowledge, attitudes, previous experiences, and future intention of undergraduate students in Mainland China.[75] In this sample of 395 undergraduate students, most respondents reported prior breastfeeding exposure (92.6%), with females more likely to report prior exposure than males (95.5% vs. 87.0%, respectively; $p<0.05$). Most respondents were aware that the nutrients in breast milk and infant formula are not the same (95.0%), that breastfeeding will help a mother

feel closer to her baby (94%), and that breast milk alone provides sufficient nutrition for the first 6 months of an infant's life (84.0%). However, knowledge of the recommendation to start breastfeeding within the first hour after birth was low, with less than a third (26.5%) of respondents agreeing with the statement. Overall, breastfeeding knowledge was moderate, with respondents answering 76.7% of statements correctly and generating a mean knowledge score of 10.0 ± 1.68 out of a possible 13 points.

Over a third of respondents (34.2%) believed breastfeeding to be painful and over half (52.5%) to give less freedom to the mother.[75] In addition, acceptability of breastfeeding in public was low (34.7%) and over half of the respondents (58.2%) reported that they would feel embarrassed if they or their partners breastfed a future child in public. Nearly half of respondents (46.7%) reported that the decision to breastfeed should be made jointly by the mother and father and 14.4% believed the decision should include the whole family, including the grandparents. Three fourths of respondents (75.1%) expressed intention to breastfeed or support their partner to breastfeed in the future, with males significantly more likely to report this intention than females (81.3% vs. 71.7% p=0.04). In addition, respondents who were breastfed as an infant were more likely to express intention to breastfeed than respondents who were unsure if they were breastfed or were not breastfed (77.4% vs. 54.3%, p=0.001). These results indicate that, despite moderate breastfeeding knowledge and prior breastfeeding exposure being usual, Chinese undergraduates perceived pain, discomfort, limited freedom, and embarrassment to be associated with breastfeeding.

Australia

The Australian National Breastfeeding Strategy aims to protect, promote, support and monitor breastfeeding initiation, exclusivity, and duration, through financial support, educational

programs, and policy changes. Despite these efforts, though the 2001 Australian National Health Survey reported a breastfeeding initiation rate of 83%, this was followed by steady declines in exclusive breastfeeding, from 57% to 18% at 3 and 6 months of age, respectively.[100] Furthermore, less than half of infants were breastfed at 6, 12, and 24 months of age (48%, 23%, and 1%, respectively).

In 2005, Payne and colleagues explored the breastfeeding knowledge, attitudes, beliefs and future intentions to breastfeed or support breastfeeding among a small sample of final-year nutrition and dietetic students in Australia (n=27).[76] Over three-fourths (78%) reported being breastfed as an infant, 89% were aware that the ability to breastfeed is unrelated to breast size and over 90% knew that breast milk contains immunological factors that strengthen an infant's immune system. In addition, 77% of respondents reported not feeling embarrassed or uncomfortable when they saw a woman breastfeeding in public and 85% agreed with the public policy to support breastfeeding in public places. However, 69% reported that bottle feeding was more socially acceptable and 23% believed that formula feeding was easier on the mother, indicating some vulnerable areas to target in future interventions. Despite these attitudes, most students (92%) reported a future intention to breastfeed or support their partner to exclusively breastfeed for at least 6 months. Due to the small sample size and students' prior exposure to breastfeeding education and training, the results of this study have limited generalizability to other undergraduate students. However, these findings highlight the importance of exploring the breastfeeding knowledge, attitudes, and beliefs of future health professionals who could support and promote breastfeeding in their personal and professional lives.

Egypt

Previous studies have found that the late initiation of breastfeeding and the introduction of pre-lacteal substances were significantly negatively associated with exclusive breastfeeding and lead to early cessation of breastfeeding among Egyptian mothers.[101, 102] The 2009 rate of exclusive breastfeeding among Egyptian infants at 6 months was 38%.[103] In addition, a 2009 study with rural residents of Egypt found that though 86.5% of mothers initiated breastfeeding within 1 day of birth, 48% of newborns also received pre-lacteal feeding during the first 3 days of life, impacting exclusivity almost immediately.[104]

In 2009, Ahmed and El-Guindy used an exploratory cross-sectional study to assess the breastfeeding knowledge and attitudes of Egyptian undergraduate nursing students.[77] Among the 92 respondents, most (85%) knew that breast milk alone provides enough nutrition for the first six months of an infant's life and over three-fourths (79%) knew that breastfeeding should start during the first hour postpartum. However, over 50% of respondents did not know the definition of exclusive breastfeeding and 85% did not know that exclusive breastfeeding is recommended for the first 6 months of an infant's life. Overall, the respondents' knowledge scores were low, with a mean score of 12.41 out of a possible 24 points (52%). In addition, respondents reported neutral breastfeeding attitudes, with a mean attitude score of 3.13 ± 0.64 out of a possible 5 points. Further, the authors report a weak but significant positive relationship between respondents' knowledge and attitude scores ($r=0.236$, $p=0.011$). In general, these findings reveal a lack of breastfeeding knowledge and neutral attitudes towards breastfeeding in Egyptian undergraduate nursing students. The results of this study highlight the need to improve breastfeeding education and clinical breastfeeding experience among future health professionals who will play a vital role in protecting, promoting, and supporting breastfeeding.

Kuwait

Breastfeeding practices have not been well studied in Kuwait.[105] Prior to 2007, no studies had explored breastfeeding rates since 1989, when an initiation rate of 86% and exclusive breastfeeding rate of 60.6% were reported.[106] In 2007, Dashti and colleagues conducted a longitudinal study with a sample of 373 women and found an almost universal breastfeeding initiation rate (92.5%), a low rate of early initiation (44.6%), an even lower rate of exclusive breastfeeding (10.5%) and high rate of supplementation with formula (76.4%).[105] Despite a high breastfeeding initiation rate, the rates of early initiation and exclusivity remain low.

In an effort to understand the knowledge and attitudes of young women in Kuwait ,who are likely to be role models in the community, Ebrahim and colleagues conducted a cross-sectional study with female undergraduate students to assess their breastfeeding knowledge, misconceptions and future intentions.[78] In a sample of over a thousand undergraduate students (n=1,106) over half of the respondents (54.1%) self-reported their knowledge on breastfeeding as "advanced" or "sufficient", whereas 9.7% reported having no information on breastfeeding. Among respondents, 12.9% and 13.2% recommended the duration of exclusive breastfeeding to be less than 4 months or between 4 and 6 months, respectively. In addition, almost three-fourths of respondents (73.9%) reported the optimal duration of exclusive breastfeeding to be more than 6 months. However, when asked about the optimal time to initiate breastfeeding almost one-fourth (23.9%) reported 2-7 days postpartum and 21.5% did not know when mothers should start breastfeeding. When asked about the benefits of breastfeeding, over 60% of respondents reported that formula-fed infants are more likely to have diarrhea/vomiting (82.8%), constipation (78.1%), common cold (60.4%) or allergies (60.6%) than infants who were breastfed. Support for breastfeeding in public places was low, with less than 5% of the respondents supporting

breastfeeding in shopping malls, restaurants, or the workplace. In addition, among the respondents who had no children, 80.5 % had seen a woman breastfeed in the past 2 years, but 95.8% had also seen an infant being bottle fed. Most respondents (87.0%) reported an intention to breastfeed. These results reveal poor knowledge on breastfeeding initiation and exclusivity which could influence future breastfeeding behavior and contribute to the suboptimal breastfeeding rates. Overall, most respondents recognized the superiority of breastfeeding and reported an intention to breastfeed but the quality of knowledge on exclusive breastfeeding, breastfeeding initiation and support for breastfeeding in public were poor.

Lebanon and Syria

The Middle East region reports some of the lowest rates of exclusive breastfeeding in the world.[107] For example, a 2006 survey in Lebanon reported that, despite a high initiation rate (95.4%), the rate of exclusive breastfeeding at 1 month postpartum was only 52% and declined to 23% and 10% at 4 and 6 months, respectively.[107] In addition, UNICEF reports that in Syria, in 2008, only 29% of infants under 6 months of age were exclusively breastfed.[108]

In an effort to gain greater insight into the factors that influence infant-feeding decisions in young adults in the Middle East, in 2011, Hamade and colleagues examined the breastfeeding knowledge, attitude, exposure, and intention in a pooled sample of female undergraduate students in Lebanon and Syria.[79] In a sample of 393 undergraduate female students (194 from Lebanon and 199 from Syria) knowledge on maternal breastfeeding benefits, adequacy of milk supply and maternal restrictions or contraindications to breastfeeding was low. For example, 67.3% and 64.4% of respondents in Syria and Lebanon, respectively, were not aware of the decreased risk of postpartum hemorrhage with breastfeeding. In addition, close to 60% of Lebanese respondents were aware of the long-term benefits of breastfeeding but 53% of Syrian

respondents believed that breastfeeding benefits last only as long as the infant is breastfeeding. Furthermore, most respondents (80.9% in Lebanon and 82.9% in Syria) reported that many women are not able to produce enough milk to feed their infant. Overall, breastfeeding knowledge was low, with a mean knowledge score of 10.39 ± 2.09 out of a possible 20 points, though this was significantly higher among Lebanese respondents compared to Syrian respondents (10.75 ± 2.16 in Lebanon vs. 10.05 ± 1.95 in Syria, $p<0.05$). However, though significant, the actual knowledge difference was negligible and neither group scored very highly. In addition, despite a minimal difference, knowledge scores were significantly higher among respondents in health-related fields compared to students in non-health related fields (11.10 ± 2.02 vs. 10.11 ± 2.05, $p < 0.001$) and among those who reported knowing someone who breastfed compared to those who reported not knowing someone who had breastfed (10.46 ± 2.08 vs. 9.24 ± 1.81, $p = 0.009$). Most Syrian and Lebanese respondents (71.4% and 73.2%, respectively) considered breastfeeding as "one of the great joys of motherhood" and an important factor in mother-infant bonding (85.4% and 74.2%, respectively). However, over half of Syrian (52.3%) and Lebanese (65.5%) respondents believed that women should not breastfeed in public, with a most participants reporting that they would not breastfeed at a restaurant (71.1% of Lebanese and 74.9% of Syrians) or a place of worship (71.1% of Lebanese and 58.3% of Syrians). The authors report that these negative attitudes toward breastfeeding in public could stem from societal disapproval, the stigmatization of breastfeeding in public places in Arab culture, and a lack of public facilities in which to breastfeed.

Overall, breastfeeding attitude scores were positive, with a mean attitude score of 58.12 ± 6.49 out of a possible 85 points and, though not very different, were significantly higher among Syrian respondents than among Lebanese respondents (59.97 ± 6.3 vs. 56.23 ± 6.13,

respectively, p<0.05).[79] In addition, mean attitude scores were significantly higher among respondents who reported having witnessed a woman breastfeeding compared to those who reported not having witnessed a woman breastfeeding (58.34 vs. 55.66, $p = 0.024$). Despite moderate breastfeeding attitudes, most respondents (76.4% and 88.7%, Syrian and Lebanese, respectively) reported that they planned to give breastfeeding a try and the mean breastfeeding intention score was 11.11 ± 3.38 out of a possible 16 points. Further analysis revealed that in both countries knowledge was significantly positively correlated with attitude (r=0.160, p=0.01) and, among Lebanese students, intention to breastfeed was significantly positively correlated with knowledge and attitude scores (r=0.209 and r=0.270, respectively, p=0.01) whereas in Syria these associations did not reach statistical significance. The findings of this study reveal that Syrian and Lebanese respondents had a low level of breastfeeding knowledge, positive breastfeeding attitudes overall, but negative attitudes toward breastfeeding in public. In addition, these groups have positive breastfeeding intention. That breastfeeding knowledge and attitudes were identified as significant predictors of intention to breastfeed among Lebanese respondents but not Syrian respondents highlights the need for culture and country specific interventions.

Nigeria

In Nigeria, breastfeeding is universal with 97.3% of women initiating breastfeeding.[109] However, the rate of exclusive breastfeeding has been low for the past couple of decades and continues to decline. The Nigerian Demographic and Health Survey estimated the level of exclusive breastfeeding at 13% percent in 2008, a drop from the 17% estimate from 2003.[109]

Ogunba and Agwo explored the breastfeeding knowledge, attitudes and intention of female undergraduate students.[80] In a sample of 200 respondents, only 3.5% believed that breastfeeding could enhance the mother-infant bond and 33% incorrectly identified the duration

of exclusive breastfeeding as 12 months. Overall, most respondents (94%) had average breastfeeding knowledge, 3.5% had low breastfeeding knowledge, and 2.5% had high breastfeeding knowledge. Over half of the respondents (61.5%) reported that they would combine breastfeeding and infant formula, over a third (39.5%) reported that they would not breastfeed in public, and 6% considered exclusive breastfeeding an outdated fashion. Overall, most respondents had neutral breastfeeding attitudes (77.4%), 14.6% had negative attitudes and 8.0% had positive breastfeeding attitudes. Though the authors report that respondents in medical and science fields had significantly higher knowledge and attitude scores than respondents in the art, social sciences, education fields ($p<0.000$), not enough information is provided on their data analysis. Almost two-thirds of respondents (65%) reported that they would initiate breastfeeding between 0-6 hours postpartum and 21.5% reported they would initiate after the first day. Despite a lack of knowledge on the recommended duration of exclusive breastfeeding, 40% of respondents reported an intention to exclusively breastfeed for 6 months and 25% reported an intention to do so for a year. In addition, over half of respondents (50.5%) reported an intention to terminate breastfeeding after 1 year and 28.0% to do so after 2 years. The findings of this study reveal that Nigerian female students had average breastfeeding knowledge, with a lack of understanding of exclusive breastfeeding duration, and neutral breastfeeding attitudes which could partially explain the low exclusive breastfeeding rates.

United States

In the United States, the rate of breastfeeding initiation increased from 60% to 77% between 1993 and 2006.[44] However, there were no changes in the rate of breastfeeding at 6 months during a similar time period (38.5% in 1993 and 41.5% in 2004).[44] Between 2007 and 2011, the rate of breastfeeding initiation increased from 75% to 79.2% and the rate of exclusive

breastfeeding at 6 months increased from 13% to 18.8%.[39, 110] Overall, despite steady increases in breastfeeding initiation and meeting the breastfeeding initiation Healthy People 2010 objective, duration and exclusivity rates continue to fall short of Healthy People 2010 and 2020 targets.

Forrester, Weelock, & Warren assessed the breastfeeding attitudes of high-school and college students in north Alabama.[81] From a sample of 590 respondents the authors reported that most perceived breastfeeding to be healthier and more convenient than bottle-feeding, indicating an overall positive attitude toward breastfeeding. However, the authors reported that less than half of the respondents believed that breastfeeding in public was an acceptable practice and over two-thirds (70%) perceived embarrassment as a major barrier to breastfeeding. More female respondents than male respondents reported that they would feel embarrassed if a family member (12% vs. 21%, $p<0.01$) or a stranger (34% vs. 17%, $p<0.001$) breastfed in their presence. In this sample, less than a third of respondents believed that supermarkets (15%), shopping malls (20%), parks (27%) and churches (21) were acceptable places to breastfeed. Conversely, 49% and 57%, respectively, believed that physician's waiting rooms and public restrooms were acceptable places to breastfeed. Overall, respondents had a positive attitude toward breastfeeding but recognized embarrassment as a major barrier to breastfeeding.

Similarly, Spear examined the breastfeeding knowledge and attitudes of undergraduate nursing students who had completed pediatric and obstetric nursing courses at a private university in the southeastern United States.[82] Among the 80 respondents, 85% did not know that breastfeeding is recommended for the first year of an infant's life. However, 95% knew that breast milk and formula have different compositions and 76% were aware of the maternal benefits of breastfeeding. Overall, respondents' knowledge scores were low, ranging from 35-85

points, with a mean knowledge score of 60 out of a possible 100 points. Most respondents (98%) reported an intention to breastfeed their future children though over one-third (41%) found breastfeeding in public to be unacceptable. Among those respondents who viewed breastfeeding in public as an acceptable practice there was a caveat expressed that women should be modest and cover up. In this study, knowledge was weakly but positively associated with positive attitudes toward breastfeeding in public (0.23, $p<0.05$) and plans to breastfeed (0.24, $p<0.05$). The results of this study demonstrate a need for greater emphasis on breastfeeding in the curricula of healthcare professionals who will then be better prepared to provide mothers with effective and positive breastfeeding support.

Likewise, Marrone and colleagues examined the breastfeeding knowledge and attitudes of undergraduate students enrolled in psychology courses at the University of North Dakota. [83] In a sample of 161 respondents, the mean knowledge score was 13.41 ± 2.95 out of a possible 20 points, indicating moderate knowledge. Further analysis revealed that, though not meaningfully that different, female respondents scored significantly higher than male respondents (13.83±2.65 vs. 12.48±3.38, $p=0.02$) and respondents older than 20 years of age scoring significantly higher than respondents younger than 20 years of age (data not shown by authors, $p=0.01$). With regards to breastfeeding attitudes and beliefs, on average respondents scored 38.93 ± 6.16 points on a scale from 12 to 72, indicating positive attitudes towards breastfeeding. Further analysis revealed no significant differences by gender and respondents older than 20 years of age showed more positive attitudes towards breastfeeding than participants younger than 20 years of age (data not shown by authors, $p=.001$). Intention to breastfeed was measured as the probability to breastfeed an infant in the future on a 6-point Likert scale ranging from 0 (no chance of breastfeeding) to 5 (81% to 100% chance). The average score for intention to breastfeed was 5.21 ±1.30, with no

significant differences detected by age or gender. A regression analysis was used to identify factors that may predict intention to breastfeed and revealed that in this population greater knowledge of breastfeeding was associated with a higher probability of planning to breastfeed an infant ($\beta=0.08$, $p<0.05$). Overall, in this study, the authors found that female respondents had higher knowledge scores than male respondents and respondents older than 20 years of age had higher knowledge scores and more positive attitudes than respondents younger than 20 years of age. These results suggest a need for further exploring the breastfeeding knowledge and attitudes of young adults, particularly among males.

More recently, in 2010, Kavanagh and colleagues explored the breastfeeding knowledge, attitudes, prior exposure, and future intent of undergraduate students enrolled in an introductory nutrition course at a large research university in the southeastern United States.[84] In this sample of 248 undergraduate students, most respondents were aware that breast milk and infant formula are not the same (96.8%) and that breastfeeding should be started as soon as possible after the birth (93.1%). However, knowledge of the health benefits of breastfeeding was low, with less than half (49.8%) of respondents agreeing with the statement "women who have breastfed have lowered risk of breast and ovarian cancer" and only 53.4% agreeing with the statement "babies who are formula fed have more illnesses than babies who are breastfed". Overall, breastfeeding knowledge was good, with a mean knowledge score of 8.94 out of a possible 12 points. Further analysis revealed that, though not very different, female respondents had significantly higher knowledge scores than male respondents (9.08 vs 8.56, $p=0.02$). Most respondents reported that breast milk is cheaper than infant formula (89%) and that breastfeeding will help a mother feel closer to her baby (86.6%). However, respondents also reported that breastfeeding is painful, restrictive and inconvenient (51.8%, 68%, and 44%, respectively). In addition, over two-thirds of

respondents (64.9%) reported that breastfeeding in public is embarrassing. In this sample, females were more likely than males to consider breastfeeding in public embarrassing and unacceptable (71.0% vs 47.7%, $p = .001$; 48.1% vs 32.3%, $p = .02$, respectively) and to consider breastfeeding in general as inconvenient and painful (47.8% vs 33.8%, $p = .02$; 60.4% vs 27.7%, $p = .000$, respectively). Overall, respondents had neutral breastfeeding attitudes, with a mean score of 4.42 out of a possible 7 points, and respondents older than 20 years of age reported higher attitude scores than respondents younger than 20 years of age (81.07 vs 74.69, $p = .002$). Further analysis revealed a significant positive correlation between knowledge and attitude scores, with a higher knowledge score indicating a more positive attitude ($r = 0.433$, $p < .01$, 2-tailed). Nearly two-thirds of respondents (61.3%) reported being breastfed as an infant and further analysis revealed that respondents who had been breastfed scored significantly higher on infant-feeding knowledge ($F = 5.41$, $p = .005$) and attitudes ($F = 16.228$, $p = .000$), compared to those who were unsure and those who were not breastfed. In addition, 81.7% of respondents reported an intention to breastfeed or support their partner to breastfeed and those with intent to breastfeed scored significantly higher on breastfeeding knowledge and attitudes compared to those who did not intend to breastfeed or were unsure ($p = .000$ for both knowledge and attitude). Overall, in this population of undergraduate students breastfeeding knowledge was good, attitudes were neutral and intention to breastfeed or support a partner to breastfeed was high.

Jefferson explored the infant feeding attitudes and breastfeeding intentions of Black college students at the University of Memphis and Saint Louis University using the Iowa Infant Feeding Attitude Scale (IIFAS) and a demographic questionnaire.[85] In a sample of 348 students, more than half (56%) agreed that breast milk is healthier for infants than formula and 50% disagreed with the belief that nutritional benefits of breast milk only last as long as the infant is

breastfed, indicating moderate knowledge about the benefits of breastfeeding. Despite 45% of respondents reporting that formula feeding is more convenient than breastfeeding 70% believed that breast milk is the ideal food for infants and 91% agreed that breast milk is less expensive, indicating more positive attitudes towards breastfeeding than formula feeding. However, 46% of respondents reported that women should not breastfeed in public areas. Overall, the mean attitude score was 57 ± 6.99 on a scale from 17 to 85 points indicating moderate breastfeeding attitudes. There was a significant difference in attitude score by gender ($t = -4.52$, $p < .001$), and by knowing someone who had breastfed ($t = -4.65$, $p < .001$) and age ($F = 5.287$, $p < .001$). In addition, further analysis revealed a weak yet positively significant correlation between infant feeding attitude scores and older age ($r=0.184$, $p<0.001$), female gender ($r=0.236$, $p<0.001$) and knowing someone who had breastfed ($r=0.242$, $p<0.001$). Nearly half of respondents (48%) reported a high probability (81% to 100%) to breastfeed future children, measured on a 6-point Likert scale ranging from 0 (no chance of breastfeeding*) to* 5 (81% to 100% chance). Chi-square analysis revealed a positive significant association between breastfeeding intention and being breastfed as an infant ($\chi^2 = 46.12$, $p < .001$), knowing someone who had breastfed ($\chi^2 = 32.53$, $p < .001$) and having higher attitude scores ($\chi^2 = 79.96$, $p < .001$). Overall, in this sample, respondents were knowledgeable about the benefits of breastfeeding and had more positive attitudes toward breastfeeding than formula feeding.

Honduras

As is the case with many other Latin American countries, Honduras is currently undergoing rapid economic development, urbanization, and overall modernization.[38, 111-114] These demographic and economic changes lead to changes in maternal education, employment, and attitudes and beliefs about infant care that may impact the breastfeeding patterns.[115, 116]

Unfortunately, the literature documents that these changes in rapid economic growth and urbanization are most likely to have a negative effect on the traditional breastfeeding patterns of developing populations.[114, 117, 118] In light of the benefits associated with breastfeeding for infants, mothers, and the community, breastfeeding epidemiology is crucial for understanding and minimizing potentially negative changes to health outcomes being shaped by the transition currently underway in Honduras.

Breastfeeding in Honduras

In Honduras, breastfeeding initiation is a widespread practice.[38] The 2011-2012 Encuesta Nacional de Salud y Demografia [National Demographic and Health Survey] reported that 96.3% of infants born in the two preceding years were put to the breast, even if only once ('ever breastfed').[38] However, breastfeeding initiation rates decrease with maternal education level and household wealth index quintile,[38] which is the opposite of the relationship observed in the United States and other industrialized nations where women with higher levels of education and income have improved breastfeeding initiation outcomes when compared to their less educated and lower income counterparts.[2, 114, 119, 120] In Honduras, though the authors of the provide only descriptive statistics, it is clear that lower-income and less well-educated mothers tend to have better breastfeeding outcomes.[38] For example, 98.2% of mothers with no education initiated breastfeeding compared to 91.1% of mothers who completed higher education. Similarly, 98.2% of mothers from households in the lowest wealth index quintile initiated breastfeeding compared to 94.4% of mothers from households in the highest wealth index quintile.[38] Again, though not reported to be statistically significantly different, the tendency is apparently the opposite of that found in populations in the United States[2, 114, 119, 120]

This pattern continues beyond breastfeeding initiation, and is seen in both duration and exclusivity. The WHO recommends that mothers initiate breastfeeding within one hour of birth ('early initiation').[19] However, in Honduras, less than two-thirds (63.8%) of mothers report this practice.[38] Mothers from rural areas were more likely to initiate breastfeeding within one hour of birth than those in urban areas (69.7% vs. 56.8%, respectively). In addition, early initiation was higher among mothers with no education and from households in the lowest wealth index quintile (75.7% and 76.1%, respectively) compared to mothers with higher education and from households in the highest wealth index quintile (40.5% and 52.7%).[38]

Although exclusive breastfeeding during the first six months of an infant's life is recommended by the WHO and UNICEF, it is not fully practiced in Honduras. [19, 37, 38] In 2011-2012, less than half (44.7%) of infants < 2 months old, 38.3% of infants < 4 months old, and 31.2% of infants < 6 months old were exclusively breastfed.[38] In addition, 43.5% of infants received a prelacteal feed during the first three days after birth.[38] The proportion of infants who received a prelacteal feed was lower among infants whose mothers had no education compared to infants whose mothers had higher education (29% vs. 55.3%, respectively). Moreover, more than half (55.3%) of infants from households in the highest wealth index quintile received a prelacteal feed compared to 29% of infants from households in the lowest wealth index quintile.[38]

The WHO recommends at least 2 years of breastfeeding for all infants.[19] In Honduras, 92.3% infants <6 months of age were breastfeeding.[38] However, this proportion decreases to 80% for infants between 6 and 9 months old, to 69.6% for infants between 12 and 15 months old, and to 43.3% for infants between 20 and 23 months old.[38] Among children under 3 years old, the mean duration of any breastfeeding is 18.7 months. Interestingly, contrary to what has been

observed in the United States and other industrialized countries where women with higher levels of education and income have improved breastfeeding duration outcomes, in Honduras breastfeeding duration rates decrease with maternal education level and household wealth index quintile.[2, 38, 114, 119, 120] The mean duration of any breastfeeding among infants whose mothers had no education was higher compared to infants whose mothers had higher education (22.5 months vs. 13.5 months, respectively). Moreover, the mean duration of any breastfeeding for infants from households in the highest wealth index quintile was lower compared to infants from households in the lowest wealth index quintile (12.3 months vs. 22.0 months).[38]

In summary, in Honduras, breastfeeding initiation and duration rates are high but exclusivity lags behind WHO recommendations. In light of the demographic and economic changes currently underway in Honduras, maintaining breastfeeding as a positive health behavior is likely to be an important public health strategy for improving infant and child health. Understanding the breastfeeding knowledge, attitudes, prior exposure, and intent of future parents from this population may provide important points of intervention for initiatives targeting both maintenance and improvement of breastfeeding behaviors in Honduras. However, to the best of the authors' knowledge, no previous research has explored these factors in the Honduran population, particularly among young adults.

Conclusion

The research studies presented here demonstrate a need for continued research. Studies that explored the breastfeeding knowledge, attitudes, previous exposure and intent of undergraduate students found that although students are somewhat knowledgeable and have positive attitudes the acceptability of breastfeeding in public is an issue shared by many

nations.[75, 77-79, 81, 82, 84, 85] Furthermore, while students believed that breast milk is healthier for infants, formula feeding was considered more convenient.[73, 75, 81, 83-85, 121]

Future studies should explore the breastfeeding knowledge and attitudes of college and university students in novel populations to identify unique and culturally-relevant areas for future interventions aimed at the promotion of breastfeeding initiation, duration, and exclusivity.

Purpose and Research Questions

The study aims to explore the breastfeeding knowledge, attitudes, prior exposure and future intent of undergraduate students in Honduras.

The objectives of this study are:

- To describe and identify any relationships between demographics, breastfeeding knowledge, attitudes, prior exposure, and future breastfeeding intent in a sample of undergraduate students in Honduras.
- To explore how demographics, breastfeeding knowledge, attitudes, and prior exposure may be predictive of future breastfeeding intent.

The research questions that will be addressed in this study are the following:

1. What is the breastfeeding knowledge, prior exposure, and future intent of this sample of undergraduate students in Honduras?
2. What are the breastfeeding attitudes of this sample of undergraduate students in Honduras?
3. What is the relationship between breastfeeding knowledge, attitudes, prior exposure and future intent and demographic characteristics?
4. What is the relationship between demographic characteristics and breastfeeding knowledge and attitude scores and future breastfeeding intent?

CHAPTER II. MANUSCRIPT

Introduction

The short-term and long-term benefits of breastfeeding for infants, mothers and the community have been acknowledged and documented throughout the literature, with evidence that many of these benefits increase with breastfeeding exclusivity and duration.[1-3] Breastfeeding has been associated with a decreased incidence and/or severity of respiratory tract infections, acute otitis media, and sudden-infant death syndrome (SIDS) in infants and a reduced risk of postpartum depression and breast and ovarian cancer in mothers.[3, 6-11] In addition, breastfeeding can lead to economic benefits for families and society due to fewer health insurance claims and lower employee absenteeism and turnover rates.[2, 10, 14] As a result, national and international organizations recommend an increase in breastfeeding initiation, exclusivity, and duration rates.[6, 10, 19] Nonetheless, though this differs from country to country, many countries struggle to increase their breastfeeding rates to meet national or global objectives.[37] For example, in Honduras, over 95% of mothers initiate breastfeeding, but exclusivity is problematic.[38] Less than one-third (31.2%) of Honduran mothers exclusively breastfeed through 6 months and the mean duration of predominant breastfeeding is only 3.5 months.[38]

Research indicates that breastfeeding knowledge and prior exposure to breastfeeding are positively associated with positive breastfeeding attitudes.[83, 93, 122-127] Moreover, breastfeeding knowledge and attitudes are associated with breastfeeding intention, which is in turn a strong predictor of breastfeeding initiation and duration.[46, 65, 69, 128-135] Importantly, though most breastfeeding research occurs in the pregnant and postpartum populations, research indicates that breastfeeding intention is often formed prior to conception, possibly as early as the adolescent period and that women who make an infant feeding decision before pregnancy are more likely to choose breastfeeding than those who make a decision during or after pregnancy.[41, 72, 122, 136-139]

Therefore, understanding and targeting the breastfeeding knowledge, attitudes, prior exposure, and intent of young adults may be an effective way to impact future breastfeeding trends.

To our knowledge, this will be the first study to explore breastfeeding knowledge, attitudes, prior exposure and intention among undergraduate students in Honduras. Previous studies have explored these concepts in undergraduate populations in the United States[81-85], Mainland China[75], Hong Kong[73], Korea[74], Australia[76], Egypt[77], Kuwait[78], Lebanon and Syria[79], finding potentially unique areas of focus within each respective population. For example, while United States students do not consider grandparents (of a future infant) to play a meaningful role in the decision to breastfeed, students in Mainland China tend to value this input.[75, 84] Therefore, the objectives of this study are to describe and identify any relationships between demographics, breastfeeding knowledge, attitudes, prior exposure, and future breastfeeding intent in a sample of undergraduate students in Honduras and to explore how demographics, breastfeeding knowledge, attitudes, and prior exposure may be predictive of future breastfeeding intent. These findings may provide clues for development of future culturally appropriate interventions.

Methods

Study Design and Sample

This was an exploratory, cross-sectional, study conducted with a convenience sample of undergraduate students attending the Universidad Nacional Autónoma de Honduras [National Autonomous University of Honduras], a major public university with over 40,000 enrolled undergraduate students. In February 2015, 500 paper-based, self-administered questionnaires were distributed in 8 general education undergraduate classrooms. Prior to implementation, the study protocol was approved by the Institutional Review Board of the University of Tennessee, Knoxville and supported by the Universidad Nacional Autónoma de Honduras. Participation was

voluntary and completion of the questionnaire was considered consent.

Measurement Instruments

Questionnaire Translation

Two students, one undergraduate and one graduate, bilingual in Spanish and English, translated and back-translated the questionnaire. Inconsistencies between the original and final versions were discussed and revised. The final version, consisting of three-pages, included 45 questions covering: *Demographics*; *Breastfeeding Knowledge and Attitudes*; *Breastfeeding Exposure; Family Involvement in Decision-Making;* and *Breastfeeding Intention*.

Demographics

Demographic questions included gender (female or male), age (in years), ethnicity, major (health-related or non-health related) and class-standing (first year, second year, third year, fourth year and other).

Breastfeeding Knowledge and Attitudes

The breastfeeding knowledge scale consisted of 13 statements, derived from Tarrant and Dodgson, Giles and colleagues, and the Iowa Infant Feeding Attitude Scale (IIFAS), covering breastfeeding related behaviors and benefits to mothers and infants.[73, 140, 141] Possible responses to these statements included 'true', 'false' and 'I don't know'. The 'I don't know' response option, which has not been included in previous studies, was included in an attempt to differentiate between actual misinformation and simple lack of knowledge. Responses to the breastfeeding knowledge scale were recoded, with correct responses receiving a score of "1", while incorrect, blank and 'I don't know' responses received a "0", allowing for a total knowledge score ranging from 0 to 13.

The breastfeeding attitude scale consisted of 16 statements, derived from Tarrant and

Dodgson and the IIFAS, using a 5-point Likert-like scale, with possible responses ranging from "strongly disagree" to "strongly agree".[73, 141] Responses to the breastfeeding attitude scale were recoded from 1 ("strongly disagree") to 5 ("strongly agree") allowing for a total attitude score ranging from 16 to 80.

Breastfeeding Exposure

Three questions were used to explore prior breastfeeding exposure, including "Were you breastfed when you were a baby?", "Do you know someone who has breastfed a baby?" and "Have you ever witnessed a woman breastfeeding her baby?". Possible responses to these questions included "yes", "no" and "unsure". This scale has been previously used with populations of undergraduate students attending large universities in the United States, Hong Kong, and China.[73, 75, 84]

Family Involvement in Decision-Making

Family involvement in the decision to breastfeed was explored by asking participants to select a response to the statement: "The decision to breastfeed should be...". Possible responses included "left entirely to the baby's mother", "left mostly to the baby's mother with input from the baby's father", "left mostly to the baby's mother with input from the maternal grandmother", "left mostly to the baby's mother with input from both of the baby's grandmothers", "a joint decision by the baby's mother and father", "left mostly to the baby's father with input from the baby's mother", or participants could provide their own response under "other".

Breastfeeding Intention

A question asking students to indicate if they would breastfeed, or support a partner to breastfeed, in the future captured their intention to breastfeed a future child. Possible responses to this question included "yes", "no" and "unsure".

Data Analysis

Data were double-entered into an electronic spreadsheet, cleaned, compared for agreement and analyzed using IBM SPSS 22.0. All discrepancies were reconciled with the paper- questionnaires. Questions that received more than one answer were considered missing data. Therefore, the sample size of individual responses to questions was variable.

Questionnaires from students under the age of 18 were excluded (n=184) as the Institutional Review Board did not approve the inclusion of underage participants. In addition, due to the focus on young adults, questionnaires from students older than 24 years of age (n=22) were removed from analysis. Further, questionnaires were considered incomplete and dropped from analysis if more than 20% of questions were unanswered (n=5) or if participants did not report their age (n=3). Therefore, the final sample size was 286.

Prior to analysis, responses to breastfeeding attitude statements favoring formula feeding were reverse-coded to ensure that higher scores were representative of more positive attitudes towards breastfeeding. Exploratory factor analysis was used to identify potential underlying constructs in the attitude scale.

Descriptive analysis, including frequencies and means, was used to describe demographic characteristics and to review initial responses to all knowledge and attitude statements and breastfeeding exposure, decision making, and intent questions. Independent *t* tests and Mann-Whitney U tests were used to examine the influence of demographic characteristics (gender, age, major and class standing), prior breastfeeding exposure, and breastfeeding intention on breastfeeding knowledge and attitudes. Chi-square analysis was used to examine relationships between categorical variables. Nonparametric testing was used to assess relationships between breastfeeding knowledge and attitudes, as neither of these variables were normally distributed.

Specifically, this relationship was assessed with a Spearman correlation. An alpha level of $p<0.05$ was set for all analyses, to determine statistical significance.

As breastfeeding knowledge and breastfeeding attitudes were measured on different scales, and not normally distributed, these scores were standardized prior to regression analyses. A logistic regression was used to identify potential indicators of breastfeeding intention. Demographic and prior exposure variables, determined to be significantly related to breastfeeding intention in bivariate analysis ($p\leq0.1$), and standardized breastfeeding knowledge and attitude subscale scores were entered into the regression model. Similarly, to identify potential predictors of breastfeeding knowledge, a linear regression was conducted using the standardized breastfeeding knowledge variable as the dependent variable. Demographic and prior exposure variables, determined to be significantly related to breastfeeding intention in bivariate analysis ($p\leq0.1$), and the standardized attitude subscale scores were entered into the regression model.

Results

Demographic Characteristics

Demographic characteristics are summarized in **Table 2.1**. The sample was almost evenly split between females (n=147, 51.4%) and males (n=139, 48.6%). Most of the participants were from non-health related majors (n=222, 77.9%), were freshmen (n=202, 70.9%) and were ≥19 years of age (n=148, 51.7%). A comparison by gender revealed that females were significantly more likely than males to be from health-related majors (31.5 vs. 12.2%, females vs. males, p=0.000). No differences in participants' age or class standing were found by gender.

Table 2.1. Demographic Characteristics of a Sample of Honduran Undergraduate Students, Overall and by Gender (n=286)[a]

Characteristics		**Female** n (%)	**Male** n (%)	**Total** n (%)
Age, years	<19	65 (44.2)	73 (52.5)	138 (48.3)
	≥19	82 (55.8)	66 (47.5)	148 (51.7)
Major[b]	Health-Related	46 (31.5)	17 (12.2)	63 (22.1)
	Non-Health Related	100 (68.5)	122 (87.8)	222 (77.9)
Class-Standing	Freshman	96 (65.8)	106 (76.3)	202 (70.9)
	Non-Freshman	50 (34.2)	33 (23.7)	83 (29.1)

[a] The total number of participant responses may not add up to 286 due to missing answers.
[b] Significantly different by gender (Chi-square analysis, $p<0.05$)

Breastfeeding Exposure, Decision-Making and Intention

Table 2.2 describes participants' prior breastfeeding exposure, opinions on breastfeeding decision making, and future intention to breastfeed or support a partner to breastfeed. Most participants reported prior breastfeeding exposure: 89.3% reported being breastfed as an infant; 95.3% reported knowing someone who had breastfed; and 98.9% reported having witnessed someone breastfeeding. Due to the low number of participants reporting no prior breastfeeding exposure, participants' responses were not categorized into different levels of exposure as has been done in previous studies.[73, 75, 79, 84] Over three-fourths of participants (82.0%) expressed their intention to breastfeed or support a partner to breastfeed in the future. A comparison by gender revealed that females were significantly more likely than males to report being breastfed as an infant (94.5% vs. 83.8%, females vs. males, p=0.04) and to intend to breastfeed or support a partner to breastfeed in the future (88.8% vs. 74.4%, females vs. males, p=0.02). It should be noted, however, that among those participants who did not express an intention to breastfeed or

Table 2.2. Breastfeeding Prior Exposure, Decision Making, and Intention to Breastfeeding of Honduran Undergraduate Students (n=383) Overall and by Gender (n=286)[a]

Characteristics		**Total** n (%)	**Female** n (%)	**Male** n (%)
Were you breastfed when you were a baby? [b, c]	Yes	251 (89.3)	137 (94.5)	114 (83.8)
	No	18 (6.4)	6 (4.1)	12 (8.8)
	Unsure	12 (4.3)	2 (1.4)	10 (7.4)
Do you know someone who has breastfed a baby?[c]	Yes	265 (95.3)	137 (97.2)	128 (93.4)
	No	12 (4.3)	4 (2.8)	8 (5.8)
	Unsure	1 (0.4)	-	1 (0.7)
Have you ever witnessed a woman breastfeeding in person? [c]	Yes	277 (98.9)	144 (100)	133 (97.8)
	No	2 (0.7)	-	2 (1.5)
	Unsure	1 (0.4)	-	1 (0.7)
Would breastfeed, or support a partner to breastfeed, in the future? [b, c]	Yes	223 (82.0)	127 (88.8)	96 (74.4)
	No	3 (1.1)	-	3 (2.3)
	Unsure	46 (16.9)	16 (11.2)	30 (23.3)
The decision to breastfeed should made… [a]	Entirely by the baby's mother	147 (56.1)	76 (57.1)	71 (55.0)
	Mostly by the baby's mother with input from the baby's father	52 (19.8)	27 (20.3)	25 (19.4)
	Jointly by the baby's mother and father	57 (21.8)	30 (22.6)	27 (20.9)
	Mostly by the baby's mother with input from one or both grandmothers	5 (1.9)	-	5 (3.9)
	Mostly by the baby's father with input from the baby's mother	1 (0.4)	-	1 (0.8)

[a] The total number of participant responses may not add up to 286 due to missing answers.
[b] Significantly different by gender (Chi-square analysis, $p<0.05$)
[c] To increase cell size, "no" and "unsure" responses were combined and compared to "yes" responses.

support a partner to breastfeed in the future, 93.8% were unsure rather than opposed (6.2%) to the concept. Over half of the participants expressed the opinion that the decision to breastfeed should be made entirely by the mother (56.1%) and slightly over one-fifth believed the decision should be made jointly by the mother and father (21.8%).

Breastfeeding Knowledge

Responses to each breastfeeding knowledge statement are shown in **Table 2.3**. Over 90% of participants agreed with the statement that "breast milk should be the first food for babies", 90.4% agreed that "breastfeeding alone typically provides sufficient nutrition for the first six months of life", and 87.6% disagreed with the statement "nutrients in breast milk and infant formula are the same". However, the 'I don't know' response option revealed that over half of the participants (54%) did not know if "a woman who has breastfed has a lower risk of breast cancer", 47.2% did not know if "breastfeeding helps prevent respiratory infections in the baby", and 45.8% did not know if the "benefits of breastfeeding continue even after weaning". Furthermore, over one-third of participants did not know if "breastfeeding should be started within the first hour after birth" (35.5%) and 45.1% did not know if "women who have small breasts can make enough breast milk".

Chi-square analysis was used to examine the relationship between demographic characteristics and responses to individual knowledge statements and showed differences in the understanding of some concepts (**Table 2.4**). For example, female participants were significantly more likely to understand that alcohol is passed from the mother's body to breast milk than were male participants (74.1% vs 62.6%, p=0.035), older students were significantly more likely to understand that formula fed babies may suffer from more illnesses than breastfed babies than were younger students (56.8% vs. 42.8%, p=0.018), and participants from health-related majors

Table 2.3. Responses of Honduran Undergraduate Students to Breastfeeding Knowledge Statements (n = 286)[a]

	True n (%)	**False** n (%)	**I Don't Know** n (%)
'True' is the correct answer.			
Breastfeeding should be started within the first hour after birth	138 (48.9)	44 (15.6)	100 (35.5)
The first food for babies should be breast milk	281 (98.3)	-	5 (1.7)
Breastfeeding alone typically provides sufficient nutrition for babies for the first 6 months of life	253 (90.4)	15 (5.4)	12 (4.3)
Breastfeeding helps prevent respiratory infections in the baby	136 (47.9)	14 (4.9)	134 (47.2)
Formula fed babies may suffer from more illnesses than breastfed babies	143 (50.4)	50 (17.6)	91 (32.0)
The benefits of breastfeeding for babies continue even after weaning	135 (47.2)	20 (7.0)	131 (45.8)
Breastfeeding will help a mother feel closer to her baby	239 (84.5)	19 (6.7)	25 (8.8)
Women who have breastfed have a lower risk of breast cancer	82 (28.8)	49 (17.2)	154 (54.0)
Most women can make enough breast milk to adequately feed their baby	216 (76.1)	38 (13.4)	30 (10.6)
Alcohol is passed from the mother's body to breast milk	196 (68.8)	20 (7.0)	69 (24.2)
'False' is the correct answer			
The nutrients in breast milk and infant formula are the same	11 (3.9)	247 (87.6)	24 (8.5)
Breastfeeding prevents a woman from returning to her pre-pregnancy weight	38 (13.5)	95 (33.7)	149 (52.8)
Women who have small breasts cannot make enough breast milk	30 (10.5)	127 (44.4)	129 (45.1)

[a] The total number of participant responses may not add up to 286 due to missing answers.

Table 2.4. Honduran Undergraduate Students Correctly Responding to Breastfeeding Knowledge Statements by Demographic Factors (n = 286)

Knowledge Statement	Gender		Age		Major		Class Standing	
	Female n (%)	Male n (%)	<19 n (%)	≥19 n (%)	Health-Related		Freshman	
					Yes n (%)	No n (%)	Yes n (%)	No n (%)
Breastfeeding should be started within the first hour after birth [a,c]	84 (57.1)	54 (38.8)	60 (43.5)	78 (52.7)	43 (68.3)	94 (42.3)	92 (45.5)	45 (54.2)
The first food for babies should be breast milk	145 (98.6)	136 (97.8)	138 (100)	143 (96.6)	63 (100)	217 (97.7)	201 (99.5)	79 (95.2)
Breastfeeding alone typically provides sufficient nutrition for babies for the first 6 months of life	135 (91.8)	118 (84.9)	123 (89.1)	130 (87.8)	56 (88.9)	196 (88.3)	180 (89.1)	72 (86.7)
Breastfeeding helps prevent respiratory infections in the baby	70 (47.6)	66 (47.5)	62 (44.9)	74 (50.0)	32 (50.8)	103 (46.4)	90 (44.6)	46 (55.4)
Formula fed babies may suffer from more illnesses than breastfed babies [a,b,d]	82 (55.8)	61 (43.9)	59 (42.8)	84 (56.8)	32 (50.8)	110 (49.5)	93 (46.0)	49 (59.0)
The benefits of breastfeeding for babies continue even after weaning	70 (47.6)	65 (46.8)	60 (43.5)	75 (50.7)	29 (46.0)	105 (47.3)	93 (46.0)	42 (50.6)
Breastfeeding will help a mother feel closer to her baby	124 (84.4)	115 (82.7)	112 (81.2)	127 (85.8)	53 (84.1)	185 (83.8)	172 (85.1)	67 (80.7)
Women who have breastfed have a lower risk of breast cancer	45 (30.6)	37 (26.6)	36 (26.1)	46 (31.1)	17 (27.0)	64 (28.8)	54 (26.7)	28 (33.7)
Most women can make enough breast milk to adequately feed their baby [d]	113 (76.9)	103 (74.1)	107 (77.5)	109 (73.6)	50 (79.4)	165 (74.3)	161 (79.7)	55 (66.3)
Alcohol is passed from the mother's body to breast milk [a]	109 (74.1)	87 (62.6)	97 (70.3)	99 (66.9)	45 (71.4)	150 (67.6)	137 (67.8)	59 (71.1)
The nutrients in breast milk and infant formula are the same	129 (87.8)	118 (84.9)	116 (84.1)	131 (88.5)	56 (88.9)	190 (85.6)	174 (86.1)	73 (88.0)
Breastfeeding prevents a woman from returning to her pre-pregnancy weight	53 (36.1)	42 (30.2)	51 (37.0)	44 (29.7)	25 (39.7)	69 (31.1)	68 (33.7)	27 (32.5)

Table 2.4 Continued

Knowledge Statement	Gender		Age		Major		Class Standing	
	Female n (%)	Male n (%)	<19 n (%)	≥19 n (%)	Health-Related		Freshman	
Women who have small breasts cannot make enough breast milk	72 (49.0)	55 (39.6)	57 (41.3)	70 (47.3)	27 (42.9)	99 (44.6)	91 (45.0)	36 (43.4)

[a] Significantly different by gender (Chi-square analysis, $p < 0.05$)
[b] Significantly different by age (Chi-square analysis, $p < 0.05$)
[c] Significantly different by major (Chi-square analysis, $p < 0.05$)
[d] Significantly different by class-standing (Chi-square analysis, $p < 0.05$)

were significantly more likely to agree that breastfeeding should be started within the first hour after birth (68.3% vs 42.3%, p<0.001).

The mean knowledge score, calculated using the dichotomized response to knowledge statements (i.e., Yes vs. No/I don't know/blank), was 8.0 ± 1.98, out of a possible 13 points, indicating that 61.5% of all responses were correct (data not shown). Females had significantly higher knowledge scores than males (U=8058.0, p=0.002). In addition, participants from health-related majors had significantly higher knowledge scores than participants from non-health related majors (U= 5865.5, p =0.048). No differences in knowledge score were found by participants' age or major.

Breastfeeding Attitudes

Due to small cell sizes (n<5), "strongly disagree" and "disagree" responses were combined and recoded as "disagree", and "strongly agree" and "agree" responses were combined and recoded as "agree". This resulted in a total of 3 response categories: "disagree", "neutral" and "agree". The mean attitude score was 53.8 (± 7.88), out of a possible 80 points, indicating an overall breastfeeding attitude above the midpoint of the scale.

Responses to individual attitude statements, overall and by gender, are shown in **Table 2.5.** In general, most participants agreed that "breast milk is cheaper than formula" (83.8%) and "breastfeeding is more convenient that formula feeding" (83.6%). In addition, nearly two-thirds of participants agreed with the statement that "babies enjoy breastfeeding more than formula-feeding" (63.6%) and more than half reported that seeing a woman breastfeed did not make them uncomfortable (52.5%). However, nearly half agreed with the statement that "formula-feeding gives more freedom to the mother" (49.4%) and over a third agreed that "mothers should wean their babies before they return to work or school" (37.3%). Furthermore, over half of the

participants had neutral attitudes toward the statements "nursing a baby is painful" (51.8%) and "breastfeeding can make breasts sag" (50.7%). Males were significantly more likely than females to agree with the statement that "formula-fed babies are more likely to be overfed than breastfed babies" (42.6% vs. 28.0%, males vs females, respectively; p=0.037). In contrast, females were significantly more likely than males to agree that "breast milk is cheaper than formula" (90.2% vs. 77.0%, females vs males, respectively; p=0.004) and that "nursing is painful" (44.0% vs. 25.5%, females vs males, respectively; p=0.002).

Exploratory factor analysis suggested the presence of 2 factors within the breastfeeding attitude scale, after dropping 7 statements that did not load (**Table 2.6**). Upon review of the statements loading within each factor, it was determined that one factor represented "Perceptions of Breastfeeding in Public" and a second factor represented "Value of Breastfeeding". The "Perceptions of Breastfeeding in Public" subscale included 5 statements, allowing for a subscale score ranging from 0 to 25, and had a Cronbach's alpha of 0.806. The mean score of this subscale was 17.3. The "Value of Breastfeeding" subscale included 4 statements, allowing for a subscale score ranging from 0 to 20, and had a Cronbach's alpha of 0.662. The mean score of this subscale was 15.4. An exploration of the relationship between breastfeeding knowledge scores and the breastfeeding attitude subscale scores indicates that breastfeeding knowledge scores were weakly yet statistically significant and positively correlated with the "Perceptions of Breastfeeding in Public" subscale scores ($r=0.116$, $p< 0.05$) and with the "Value of Breastfeeding" subscale scores ($r=0.250$, $p< 0.01$) (data not shown). In addition, a weak yet statistically significant positive correlation was found between the two attitude subscale scores ($r=0.129$, $p< 0.05$). An exploration of subscale scores by demographic factors revealed no differences in mean subscale score by gender, age, major, or class standing.

Table 2.5. Responses of Honduran Undergraduate Students to Breastfeeding Attitude Statements, Overall and by Gender (n=286)[a]

	Disagree n(%)			Neutral n(%)			Agree n(%)		
	Female	**Male**	**Total**	**Female**	**Male**	**Total**	**Female**	**Male**	**Total**
'Agree' is interpreted as a positive towards breastfeeding response.									
Formula-fed babies are more likely to be overfed than breastfed babies [b]	33 (23.1)	58 (18.4)	58 (20.8)	70 (49.0)	53 (39.0)	123 (44.1)	40 (28.0)	58 (42.6)	98 (35.1)
Breastfed babies are smarter than formula fed babies	77 (53.1)	54 (39.1)	131 (46.3)	42 (29.0)	56 (40.6)	98 (34.6)	26 (17.9)	28 (20.3)	54 (19.1)
Breastfed babies grow better than formula fed babies	37 (25.3)	35 (26.1)	72 (25.7)	39 (26.7)	29 (21.6)	68 (24.3)	70 (47.9)	70 (52.2)	140 (50.0)
Babies enjoy breastfeeding more than formula feeding	14 (9.7)	14 (10.1)	28 (9.9)	36 (24.8)	39 (28.3)	75 (26.5)	95 (65.5)	85 (61.6)	180 (63.6)
Breast milk is cheaper than formula [b]	9 (6.3)	12 (8.9)	21 (7.6)	5 (3.5)	19 (14.1)	24 (8.6)	129 (90.2)	104 (77.0)	233 (83.8)
Breastfeeding is more convenient than formula feeding	6 (4.2)	11 (8.3)	17 (6.2)	12 (8.4)	16 (12.1)	28 (10.2)	125 (87.4)	105 (79.5)	230 (83.6)
Breastfeeding in public is acceptable	36 (25.0)	31 (22.3)	67 (23.7)	33 (22.9)	32 (23.0)	65 (23.0)	75 (52.1)	76 (54.7)	151 (53.4)
I respect women who breastfeed	-	-	21 (7.4)	-	-	12 (4.2)	-	-	250 (88.3)
'Disagree' is interpreted as a positive towards breastfeeding response.									
Formula feeding gives more freedom to the mother	27 (19.4)	27 (20.5)	54 (19.9)	44 (31.7)	39 (29.5)	83 (30.6)	68 (48.9)	66 (50.0)	134 (49.4)
Nursing a baby is painful [b]	20 (14.2)	17 (12.4)	37 (13.3)	59 (41.8)	85 (62.0)	144 (51.8)	62 (44.0)	35 (25.5)	97 (34.9)
Breastfeeding can make breasts sag	66 (46.5)	44 (32.8)	110 (39.9)	64 (45.1)	76 (56.7)	140 (50.7)	12 (8.5)	14 (10.4)	26 (9.4)
Mothers should wean their babies before they return to work or school	35 (25.9)	37 (27.2)	72 (26.6)	42 (31.1)	56 (41.2)	98 (36.2)	58 (43.0)	43 (31.6)	101 (37.3)
Seeing a woman breastfeeding in public makes me uncomfortable [c]	74 (50.7)	75 (54.3)	149 (52.5)	29 (19.9)	26 (18.8)	55 (19.4)	43 (29.5)	37 (26.8)	80 (28.2)

Table 2.5 Continued

	Disagree n(%)			Neutral n(%)			Agree n(%)		
	Female	**Male**	**Total**	**Female**	**Male**	**Total**	**Female**	**Male**	**Total**
'Disagree' is interpreted as a positive towards breastfeeding response.									
Seeing media representation of a woman breastfeeding makes me uncomfortable	107 (74.8)	88 (63.8)	195 (69.4)	21 (14.7)	31 (22.5)	52 (18.5)	15 (10.5)	19 (13.8)	34 (12.1)
Breastfeeding should only be done around family and friends	91 (65.0)	71 (51.8)	162 (58.5)	28 (20.0)	37 (27.0)	65 (23.5)	21 (15.0)	29 (21.2)	50 (18.1)
I will feel embarrassed if I/my partner breastfeed(s) in public	59 (41.0)	60 (44.1)	119 (42.5)	38 (26.4)	42 (30.9)	80 (28.6)	47 (32.6)	34 (25.0)	81 (28.9)

[a] The total number of participant responses may not add up to 286 due to missing answers.
[b] Significantly different by gender (Chi-square analysis, $p<0.05$)
[c] Significantly different by class standing (Chi-square analysis, $p<0.05$)

Table 2.6. Responses of Honduran Undergraduate Students to Breastfeeding Attitude Statements, by Factors (n=286)[a]

	Gender (F=Female/M=Male)						Class Standing					
	Disagree		Neutral		Agree		Disagree		Neutral		Agree	
	F	M	F	M	F	M	Freshman		Freshman		Freshman	
							Yes	No	Yes	No	Yes	No
Factor 1: "Perceptions of Breastfeeding in Public"												
Seeing a woman breastfeeding in public makes me uncomfortable[b]	74 (50.7)	75 (54.3)	29 (19.9)	26 (18.8)	43 (29.5)	37 (26.8)	109 (54.5)	39 (47.0)	43 (21.5)	12 (14.5)	48 (24.0)	32 (38.6)
Seeing media representation of a woman breastfeeding makes me uncomfortable	107 (74.8)	88 (63.8)	21 (14.7)	31 (22.5)	15 (10.5)	19 (13.8)	137 (68.5)	57 (71.3)	42 (21.0)	10 (12.5)	21 (10.5)	13 (16.3)
Breastfeeding should only be done around family and friends	91 (65.0)	71 (51.8)	28 (20.0)	37 (27.0)	21 (15.0)	29 (21.2)	114 (57.9)	47 (59.5)	50 (25.4)	15 (19.0)	33 (16.8)	17 (21.5)
Breastfeeding in public is acceptable	36 (25.0)	31 (22.3)	33 (22.9)	32 (23.0)	75 (52.1)	76 (54.7)	46 (23.1)	21 (25.3)	44 (22.1)	21 (25.3)	109 (54.8)	41 (49.4)
I will feel embarrassed if I/my partner breastfeed(s) in public	59 (41.0)	60 (44.1)	38 (26.4)	42 (30.9)	47 (32.6)	34 (25.0)	85 (43.1)	34 (41.5)	62 (31.5)	18 (22.0)	50 (25.4)	30 (36.6)
Factor 2: "Value of Breastfeeding"												
Breastfed babies grow better than formula fed babies	37 (25.3)	35 (26.1)	39 (26.7)	29 (21.6)	70 (47.9)	70 (52.2)	45 (22.8)	27 (32.9)	46 (23.4)	22 (26.8)	106 (53.8)	33 (40.2)
Babies enjoy breastfeeding more than formula feeding	14 (9.7)	14 (10.1)	36 (24.8)	39 (28.3)	95 (65.5)	85 (61.6)	16 (8.0)	12 (14.6)	57 (28.5)	18 (22.0)	127 (63.5)	52 (63.4)
Breast milk is cheaper than formula[c]	9 (6.3)	12 (8.9)	5 (3.5)	19 (14.1)	129 (90.2)	104 (77.0)	15 (7.7)	6 (7.4)	18 (9.2)	6 (7.4)	163 (83.2)	69 (85.2)
Breastfeeding is more convenient than formula feeding	6 (4.2)	11 (8.3)	12 (8.4)	16 (12.1)	125 (87.4)	105 (79.5)	13 (6.7)	4 (5.0)	18 (9.2)	10 (12.5)	163 (84.0)	66 (82.5)

[a] The total number of participant responses may not add up to 286 due to missing answers.
[b] Significantly different by class-standing (Chi-square analysis, $p<0.05$)
[c] Significantly different by gender (Chi-square analysis, $p<0.05$)

Relationship between Breastfeeding, Knowledge, Attitudes, Prior Exposure, and Intention

Participants who reported being breastfed as a baby had significantly higher knowledge (8.1 vs. 6.9, p=0.001), attitude (54.2 vs. 50.5 p =0.013), and "Perceptions of Breastfeeding in Public" subscale scores (17.5 vs. 15.5, p =0.045) compared to those who were unsure or were not breastfed (**Table 2.7**). Similarly, participants who reported knowing someone who had breastfed had significantly higher knowledge (8.0 vs. 6.9, p=0.044) and "Perceptions of Breastfeeding in Public" subscale scores (17.5 vs. 14.0, p=0.015) than those who were unsure or did not know someone who had breastfed. No differences in knowledge or attitudes were observed between participants who had witnessed a woman breastfeed in public and those who were unsure or had not witnessed a woman breastfeed in public. In addition, participants who reported being breastfed were more likely to intend to breastfeed, or support a partner to breastfeed, in the future compared to participants who were unsure or were not breastfed (94.2% vs. 67.3%, respectively p=0.00). Participants who reported an intent to breastfeed, or support a partner to breastfeed, in the future had significantly higher breastfeeding knowledge scores (8.3 vs. 6.98, p<0.001), attitude scores (54.6 vs. 50.7, p=0.002), and "Value of Breastfeeding" subscale scores (15.7 vs. 13.9, p=0.001), compared to those who were unsure or did not plan to breastfeed or support a partner to breastfeed in the future.

Table 2.7. Comparison of Breastfeeding Exposure and Intent Statements by Knowledge, Attitude, and Attitude Subscale Scores

		Knowledge Score Mean (SD)	**Attitude Score** Mean (SD)	**'Perceptions of Breastfeeding in Public' Subscale Score** Mean (SD)	**'Value of Breastfeeding' Subscale Score** Mean (SD)
Exposure Statements					
Were you breastfed when you were a baby? [a, b, c]	Yes	8.1 (1.92)	54.2 (7.80)	17.5 (5.03)	15.5 (3.34)
	No or Unsure	6.9 (2.16)	50.4 (8.16)	15.5 (5.32)	14.3 (3.54)
Do you know someone who has breastfed a baby? [a, c]	Yes	8.0 (1.92)	54.1 (7.92)	17.5 (5.01)	15.4 (3.39)
	No or Unsure	6.9 (2.47)	50.2 (6.45)	14.0 (5.61)	15.3 (3.45)
Have you ever witnessed a woman breastfeeding in person?	Yes	8.0 (1.98)	53.9 (7.95)	17.3 (5.08)	15.3 (3.39)
	No or Unsure	7.6 (0.58)	53.0 (5.29)	14.7 (5.13)	16.6 (3.06)
Intent Statement					
Would breastfeed, or support a partner to breastfeed, in the future? [a, b, d]	Yes	8.2 (1.90)	54.6 (7.86)	17.5 (5.03)	15.7 (3.26)
	No or Unsure	6.9 (2.07)	50.7 (7.89)	16.2 (5.35)	13.9 (3.53)

[a] Significantly different knowledge score, $p < 0.05$
[b] Significantly different attitude score, $p < 0.05$
[c] Significantly different 'Perceptions of Breastfeeding in Public' subscale score, $p < 0.05$
[d] Significantly different 'Value of Breastfeeding' subscale score, $p < 0.05$

To investigate the influence of gender, age, major, prior breastfeeding exposure and breastfeeding knowledge and attitudes on future breastfeeding intent the researchers considered a logistic regression. However, because over 80% of participants reported an intent to breastfeed in the future, the data set violated the assumption for proportional odds. Thus, predictive tests would not have been a useful method to determine a factor's association with future breastfeeding intent.

However, the data did allow for completion of linear regression to investigate possible significant predictors of breastfeeding knowledge. Demographic and prior exposure variables, generating a p-value of ≤ 0.10 in bivariate analysis with breastfeeding knowledge, and the standardized attitude subscale scores were entered into the model. Due to multicollinearity between the "Perceptions of Breastfeeding in Public" and the "Value of Breastfeeding" subscales, two individual linear regressions were conducted.

Results from the first linear regression indicated that being female, being breastfed, and having a higher "Perceptions of Breastfeeding in Public" subscale score were predictive of a higher breastfeeding knowledge score (data not shown). Although statistically significant, this model only explained 9.1% of the variability in breastfeeding knowledge. Results from the linear regression using the "Value of Breastfeeding" subscale, were only slightly stronger, explaining 13% of the variability in breastfeeding knowledge (**Table 2.8**). Though being breastfed and having a higher "Value of Breastfeeding" subscale score were predictive of a higher breastfeeding knowledge score in this model, being female was not significantly related.

Table 2.8. Linear Regression Predicting Breastfeeding Knowledge of Honduran Undergraduate Students

	B	SEB	β	p-value
Gender	0.203	0.117	0.103	0.084
Major	0.228	0.140	0.096	0.105
Do you know someone who has breastfed a baby?	0.448	0.265	0.097	0.092
Were you breastfed when you were a baby?	0.415	0.184	0.132	0.025
Standardized "Value of Breastfeeding" Score	0.233	0.056	0.239	0.000
			R^2=0.130	0.000

Discussion

To the best of the authors' knowledge, this is the first study to explore the breastfeeding knowledge, attitudes, prior breastfeeding exposure, and future breastfeeding intention among undergraduate students in Honduras. This study contributes to the growing body of literature that explores these concepts among non-pregnant young adults and aims to identify which concepts are universal to this life stage, and which may be unique or population-specific. [73-85] The results of this study indicate that Honduran undergraduate students have moderate breastfeeding knowledge, neutral breastfeeding attitudes, high prior breastfeeding exposure, and high intention to breastfeed or support their partners to breastfeed in the future. A comparison of these findings with those from previous studies exploring these concepts in undergraduate populations in the United States, Mainland China, Hong Kong, Korea, Egypt, and Kuwait[73-75, 77, 78, 81-85] reveals several noteworthy similarities and differences which may be critical to consider when targeting optimal breastfeeding behaviors in the Honduran population.

Breastfeeding knowledge has been previously associated with better breastfeeding outcomes.[47, 65, 67, 130] In this study, Honduran undergraduate students demonstrated a moderate level of breastfeeding knowledge. In accord with undergraduate students from the southeastern United States.[82, 84] and China[75], most Honduran students disagreed with the statement that "the nutrients in breast milk and infant formula are the same". Moreover, Honduran students agreed

with students from China[75], Hong Kong[73], and the southeastern United States.[84] on understanding that "breastfeeding alone typically provides sufficient nutrition for the first six months of life", with all three samples reporting greater than 60% agreement. Surprisingly, at the time that these surveys were administered, all of these populations reported low national rates of exclusive breastfeeding, making this finding somewhat puzzling.[38, 86, 87, 142] However, less than half of Honduran students knew that breastfeeding should be started shortly after birth. This may be explained by the prevalence of prelacteal feeds in Honduras, where 43.5% of infants received a prelacteal feed during the first three days after birth.[38] This finding is also similar to that reported by Lou and colleagues[75] where only 26.5% of Chinese students knew that breastfeeding should be started within the first hour after birth. In contrast, Tarrant and colleagues[73] and Kavanagh and colleagues,[84] in studies in Hong Kong and the southeastern United States, respectively, found that over 90% of undergraduate students knew that breastfeeding should be started shortly after birth. These differences may be a reflection of the high breastfeeding initiation rates in Honduras and Mainland China and may be driven by a perceived lack of need for education or awareness on this concept.

In this sample, less than a third of students knew that a "women who have breastfed have a lower risk of breast cancer". This finding is remarkably different than that reported by similar studies in China and Kuwait where Lou and colleagues[75] and Ebrahim and colleagues[78] found that 76.1% and 85.1% of students, respectively, knew that women who have breastfed have a lower risk of breast cancer. Moreover, only 47.9% of Honduran students knew breastfeeding helps prevent respiratory infections compared to 92.1% of Chinese students.[75] These findings highlight the low levels of knowledge on the health benefits of breastfeeding among Honduran undergraduate students.

Similar to the findings reported in previous studies, in this study, female students and students from health-related majors had significantly higher knowledge scores than male students and students from non-health related majors.[74, 79, 84] Although Kavanagh and colleagues found female students to be more knowledgeable than male students, they attribute the primary difference to more female students agreeing with the statements "breastfeeding should be started as soon as possible after the baby is born" and "women who have breastfed have lowered risk of breast and ovarian cancer".[84] These findings may provide some insight into the relatively low exclusivity rates reported in the Honduran population and may be important targets for future interventions in this population.

Breastfeeding attitudes have also been importantly associated with better breastfeeding outcomes.[66]The overall neutral breastfeeding attitude of this population appears to be largely driven by the belief that formula feeding gives more freedom to the mother and the neutral attitude towards breastfeeding being painful and making breasts sag. The belief that formula-feeding gives more freedom to the mother has been reported by students in the United States, Hong Kong, and China. [73, 75, 84] For example, Tarrant and colleagues[73] and Lou and colleagues[75] found that 77.4% and 52.5% of students, respectively, believed that formula-feeding gives more freedom to the mother. However, most Honduran students considered breastfeeding to be cheaper (83.8%) and more convenient (83.6%) than formula feeding. This is strikingly different from what has been reported by students in other studies[73, 75, 84, 85]. For example, in the United States, Kavanagh and colleagues found that less than a third of students (32.8%) believed that breastfeeding is more convenient than formula feeding[84]. Similarly, in Mainland China, Lou and colleagues found that less than half of the students (45.5%) believed that breastfeeding is more convenient than formula feeding[75].

Contrary to what has been reported by studies in the United States, [84, 85] China,[75] and Syria and Lebanon,[79] where the acceptability of breastfeeding in public appears to be an issue, over half of Honduran students (53.4%) believed that breastfeeding in public is acceptable. Moreover, at odds with what has been reported by students in the United States, Hong Kong, and Mainland China, where potential embarrassment appeared to be an important concern, less than a third of Honduran students reported that they would feel embarrassed if they or their partner breastfed in public.[73, 75, 84] However, particularly when compared to the United States. and Hong Kong, these differences may be reflective of the high breastfeeding initiation rate in Honduras and the high percentage of students who reported having witnessed a woman breastfeeding and knowing someone who had breastfeed a baby in this population. Surprisingly, in Mainland China where breastfeeding initiation is also >90% and most students had prior exposure to breastfeeding, more than half of students (58.3%) reported they would feel embarrassed if either they or their partner breastfed in public. This may be reflective of unmeasured cultural norms and could be a critical difference to consider when developing population-specific interventions.

Exposure to breastfeeding via witnessing others, having friends or relatives who have breastfed, or having been breastfed as an infant has been positively associated with intent to breastfeed.[92] In this sample of Honduran undergraduate students, the high level of prior breastfeeding exposure and future intention to breastfeed or support their partner to breastfeed in the future may be a reflection of the high breastfeeding initiation rate in the Honduran population.[38] The levels of prior breastfeeding exposure reported among undergraduate students in other populations appear to align with the breastfeeding initiation rates reported in those populations. For example, the low breastfeeding initiation rates in Hong Kong and the United States, at the time that these surveys were administered, may explain why only two-thirds of

southeastern United States undergraduates (61.3%) and less than one third of Hong Kong undergraduates (30.3%) reported being breastfed as an infant, compared to 89.3% of Honduran undergraduates.[44, 73, 84, 86, 87] In contrast, the high percentage of Honduran students reporting being breastfed as an infant is comparable to what was reported by undergraduate students in Mainland China and Lebanon and Syria where breastfeeding initiation rates are also >90%. [95-99, 107]The level of intent reported by Honduran students is greater than that reported by Hong Kong undergraduate students (63.0%) and similar to that reported by Chinese (75.1%), Syrian (76.4%) and Lebanese (88.7%) undergraduate students. [73, 75, 79] These levels of future breastfeeding intent appear to align with the breastfeeding initiation rates reported in those populations. Interestingly, Kavanagh and colleagues found that approximately 80% of undergraduate students in the southeastern United States. expressed their intention to breastfeed or support a partner to breastfeed in the future.[84] This level of intention may indicate the emerging influence of breastfeeding interventions and a potential shift in breastfeeding behavior.

In this sample, reduced variability in breastfeeding intent responses precluded the ability to explore potential indicators of future breastfeeding intention via regression analyses. However, previous studies have explored potential indicators of future breastfeeding intention via regression analyses. For example, Tarrant and Dodgson identified participant attitudes (OR = 1.32; $p < .001$), participant's own breastfeeding status (OR = 3.16; $p < .001$), and knowing someone who had breastfed (OR = 1.77; $p = .04$) as factors independently and positively associated with future breastfeeding intention.[73] Similarly, Lou and colleagues found that being breastfed as an infant (OR = 3.06; $p <0.05$), having higher breastfeeding knowledge scale *z* scores (OR = 1.38; $p <0. 05$), and having higher attitude subscale *z* scores (OR = 2.55; $p < 0.01$) were all predictive of future breastfeeding intention. In this sample, participants' gender, major,

own breastfeeding status, knowledge score, and attitude score were associated with breastfeeding intention.[75]

Alternatively, to the author's knowledge this is the first study to explore potential indicators of breastfeeding knowledge. In this study, participant's own breastfeeding status and a higher "Value of Breastfeeding" subscale score were predictive of a higher breastfeeding knowledge score, though these relationships were weak. Future studies, using study designs intended to explore potential predictors of breastfeeding knowledge, should be completed.

Limitations

This study has several limitations. The use of a convenience sample reduces generalizability, and future studies should replicate this study with different populations of young adults in Honduras. For example, because less than half of Hondurans in the 18-24 year old age group continue their education beyond high-school, this sample of undergraduate students is unlikely to reflect the knowledge and attitudes of all young adults in Honduras.[38] In addition, due to the cross-sectional study design it is not possible to report on actual future behavior. Longitudinal study designs could deepen the understanding of how breastfeeding knowledge, attitudes, and prior exposure, functioning through development of intent, ultimately affect breastfeeding behavior.

Conclusion

In summary, due to the high breastfeeding initiation and duration rates in Honduras, the finding that students reported a high level of prior breastfeeding exposure and future breastfeeding intent, was not particularly surprising. However, the moderate breastfeeding knowledge and neutral breastfeeding attitudes may provide some insight into the relatively low exclusivity rates reported in the Honduran population and provides a potential direction for

future breastfeeding promotion efforts. In addition, the differences and similarities between samples of undergraduate students from around the world highlight the need to understand populations of interest and target interventions to their unique needs.

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APPENDICES

Appendix A. Studies Measuring the Breastfeeding Knowledge, Attitudes, Prior Exposure, and Intent of Undergraduate Students

Author	Country	Population	Key Findings
Tarrant and Dodgson (2007)	Hong Kong	403 undergraduate students	High knowledge and positive attitudes towards breastfeeding Breastfeeding perceived as inconvenient, embarrassing, and restrictive of the mother's freedom. Prior exposure to breastfeeding significantly associated with higher levels of knowledge and attitudes and with future intention to breastfeed ($p<0.001$).
Kang and colleagues (2005)	Korea	341 undergraduate students	Low knowledge and positive attitudes toward breastfeeding Female students had slightly higher knowledge and more positive attitudes than male students. ($p<0.05$) Students in health-related fields had higher knowledge than students in other disciplines, but their attitudes did not differ ($p<0.01$).
Lou and colleagues (2014)	China	395 undergraduate students	Moderate breastfeeding knowledge Pain, discomfort, limited freedom, and embarrassment were perceived to be associated with breastfeeding. Low acceptability of breastfeeding in public
Payne and colleagues (2007)	Australia	27 nutrition and dietetics undergraduate students	Over three-fourths of respondents reported not feeling embarrassed or uncomfortable when they saw a woman breastfeeding in public. More than two-thirds of respondents reported that bottle feeding was more socially acceptable.
Ahmed and el-Guindy (2011)	Egypt	92 nursing undergraduate students	Low breastfeeding knowledge and neutral attitudes towards breastfeeding.
Ebrahim and colleagues (2011)	Kuwait	1106 female undergraduate students	Poor knowledge on breastfeeding initiation and exclusivity. Extremely low support for breastfeeding in public

Hamade and colleagues (2014)	Lebanon and Syria	393 female undergraduate students	Low breastfeeding knowledge and positive attitudes towards breastfeeding. Negative attitudes towards breastfeeding in public.
Ogunba and Agwo (2014)	Nigeria		Moderate breastfeeding knowledge and neutral breastfeeding attitudes. Lack of understanding of exclusive breastfeeding duration
Forrester and colleagues (1997)	United States	346 high-school and 244 college students	Positive attitudes towards breastfeeding. Embarrassment was perceived as a major barrier to breastfeeding and less than half believed that breastfeeding in public is an acceptable practice.
Spear (2006)	United States	80 undergraduate nursing students	Low breastfeeding knowledge High intention to breastfeed future children Low acceptability of breastfeeding in public
Marrone and colleagues (2008)	United States	161 undergraduate students	Female respondents had higher knowledge scores than male respondents. Respondents older than 20 years of age had higher knowledge scores and more positive attitudes than respondents younger than 20 years of age.
Kavanagh and colleagues (2012)	United States	248 undergraduate students	Good breastfeeding knowledge and neutral attitudes towards breastfeeding. High intention to breastfeed or support a partner to breastfeed. Low support for breastfeeding in public.
Jefferson (2014)	United States	348 Black undergraduate students	High knowledge on the benefits of breastfeeding and positive attitudes toward breastfeeding

Appendix B. Study Information Sheet (Spanish)

Información Acerca del Estudio de Investigación

Si usted tiene alguna pregunta, por favor póngase en contacto con el Oficial de Cumplimiento de la Oficina de Investigación de la Universidad de Tennessee al +001-865-974-3466 o con la Dirección de Investigación Científica (DICU) de la Universidad Nacional Autónoma de Honduras (UNAH) al +504-2231-0678.

Una Encuesta Sobre Los Conocimientos Y Actitudes De Los Estudiantes Universitarios Acerca De La Lactancia Materna.

INTRODUCCIÓN
Usted ha sido invitado a participar en un estudio de investigación. El propósito de este comprender mejor lo que los estudiantes de pregrado conocen y creen acerca de la lactancia materna.

INFORMACIÓN SOBRE LA PARTICIPACIÓN DE LOS PARTICIPANTES EN EL ESTUDIO
Se le pedirá responder todas las preguntas de la encuesta adjunta a la medida de su capacidad. Se le darán unos 10 minutos para completar la encuesta, momento en el que esta será recogida por los asistentes de investigación.

RIESGOS
No hay más que un mínimo riesgo por completar esta encuesta. Completar esta encuesta no es un requisito de la clase, es voluntario. No estamos recolectando nombres, así que por favor NO escriba su nombre en la encuesta.

BENEFICIOS
Las respuestas a esta encuesta nos permitirán comprender mejor lo que los estudiantes de pregrado conocen y creen acerca de la lactancia materna.

CONFIDENCIALIDAD
La información contenida en los registros del estudio se mantendrá confidencial. Los datos se almacenaran de forma segura y estarán disponibles sólo para las personas involucradas en el estudio, a menos que los participantes den permiso por escrito para hacerlo de otra manera. No se hará ninguna referencia en los informes orales o escritos que pueda vincular a los participantes en el estudio.

COMPENSACIÓN
No hay compensación económica por participar en este estudio.

CONTACTO
Si usted tiene preguntas en cualquier momento sobre el estudio o los procedimientos, puede comunicarse con la investigadora, Katie Kavanagh, al +001-865-974-6250 o con Mariana Rendon al +504-9662-3010. Si usted tiene preguntas sobre sus derechos como participante,

comuníquese con el Oficial de Cumplimiento de la Oficina de Investigación de la Universidad de Tennessee al +001-865-974-3466 o con la Dirección de Investigación Científica (DICU) de la Universidad Nacional Autónoma de Honduras (UNAH) al +504-2231-0678.

PARTICIPACIÓN

Su participación en este estudio es voluntaria; puede negarse a participar sin penalización alguna. Si usted decide participar, puede retirarse del estudio en cualquier momento sin penalización alguna y sin pérdida de beneficios a los que tiene derecho. Si usted se retira del estudio antes de que se complete la recolección de datos su encuesta será devuelta o destruida. El retorno de la encuesta completa constituye su consentimiento a participar.

Appendix C. Study Information Sheet (English)

Study Information Sheet

If you have any questions, please contact the Office of Research Compliance Officer at The University of Tennessee at +001-865 974-3466 or the Office of Scientific Research (DICU) at the National Autonomous University of Honduras (UNAH) at +504-2231-0678.

A Survey of Breastfeeding Knowledge and Attitudes of University Students

INTRODUCTION
You are invited to participate in a research study. The purpose is to better understand what undergraduates know and believe about breastfeeding.

INFORMATION ABOUT PARTICIPANTS' INVOLVEMENT IN THE STUDY
You will be asked to answer all the questions on the attached survey to the best of your ability. You will be given about 10 minutes to complete the survey, at which point the survey will be collected by the research assistants.

RISKS
There is no more than minimal risk to you for completing this survey. Completing this survey is not a class requirement, but is voluntary. We are not collecting names, so please DO NOT write your name on the survey.

BENEFITS
Responses to this survey will allow us to better understand what undergraduates know and believe about breastfeeding.

CONFIDENTIALITY
The information in the study records will be kept confidential. Data will be stored securely and will be made available only to persons conducting the study unless participants specifically give permission in writing to do otherwise. No reference will be made in oral or written reports which could link participants to the study.

COMPENSATION
There is no compensation for participating in this study.

CONTACT
If you have questions at any time about the study or the procedures, you may contact the researcher, Katie Kavanagh at +001-865-974-6250 or with Mariana Rendon at +504-9962-3010. If you have questions about your rights as a participant, contact the Office of Research Compliance Officer at The University of Tennessee-Knoxville at +001-865 974-3466 or the Office of Scientific Research (DICU) at the National Autonomous University of Honduras (UNAH) at +504-2231-0678.

PARTICIPATION

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed your data will be returned to you or destroyed. Return of the completed survey (questionnaire) constitutes your consent to participate.

Appendix D. Questionnaire for Undergraduate Students (Spanish)

UNAH
UNIVERSIDAD NACIONAL AUTÓNOMA DE HONDURAS

THE UNIVERSITY OF TENNESSEE KNOXVILLE

Conocimientos y Actitudes de los Estudiantes Universitarios Acerca de la Lactancia Materna

Tenga en cuenta que al responder y entregar este cuestionario, Usted da su consentimiento informado para que la información que ofrece sea parte del estudio. Toda la información será confidencial.

Por favor marque, circule, o escriba su respuesta a las siguientes preguntas:

1. Sexo: ☐ Hombre ☐ Mujer

2. Edad: _____ años

3. ¿Qué opción describe mejor su etnicidad

☐ Garífuna ☐ Nahoa ☐ Mestizo ☐ Otro:_____

☐ Tolupan ☐ Tawaka (Sumo) ☐ Lenca

☐ Misquito ☐ Maya Chorti ☐ No Sabe

4. ¿Cuál es el área de la carrera que estudia?
Por ejemplo: Las carreras "relacionadas con la salud" incluyen medicina, farmacia, odontología, enfermería, y nutrición. Las carreras "no relacionadas a la salud" incluyen contabilidad, economía, periodismo, mercadotecnia y las ingenierías.
☐ Relacionado con la salud ☐ No relacionado con la salud
☐ Si no está seguro, diga cuál carrera estudia y nosotros la clasificaremos: _____

5. ¿Cuál es el nivel de avance de sus estudios?
☐ Primer Año ☐ Segundo Año ☐ Tercer Año ☐ Cuarto Año ☐ Quinto Año

6. ¿De cuál departamento de Honduras es usted originario? _____

Para las siguientes preguntas, por favor marque "Verdadero (V)", "Falso (F)", o "No Se (NS)"	**V**	**F**	**NS**
7. La lactancia debería empezar dentro de la primera hora después del nacimiento.	□	□	□
8. La primera comida para los bebés debe ser la leche materna.	□	□	□
9. La lactancia proporciona la nutrición suficiente para los bebés en los primeros 6 meses de vida.	□	□	□
10. Los nutrientes de la leche materna y de la leche de fórmula son iguales.	□	□	□
11. La lactancia ayuda a prevenir infecciones respiratorias en el bebé.	□	□	□
12. Los bebés que son alimentados con leche de fórmula pueden sufrir de más enfermedades que los bebés que son amamantados.	□	□	□
13. Los beneficios de la lactancia para el bebé continúan aun después del destete.	□	□	□
14. La madre que amamanta se siente más cercana a su bebé.	□	□	□
15. Las mujeres que han amamantado tienen menor riesgo de padecer cáncer de mama.	□	□	□
16. La lactancia materna evita que la mujer vuelva a su peso anterior al embarazo.	□	□	□
17. La mayoría de mujeres pueden producir suficiente leche para alimentar adecuadamente a su bebé.	□	□	□
18. Las mujeres con mamas pequeñas no producen suficiente leche.	□	□	□
19. El alcohol pasa del cuerpo de la madre a la leche materna.	□	□	□

Seleccione una opción para cada una de las siguientes declaraciones.	**Totalmente en Desacuerdo**	**En Desacuerdo**	**Neutro**	**De Acuerdo**	**Totalmente en Acuerdo**
20. Los bebés alimentados con leche de fórmula son más propensos a ser sobrealimentados que los bebés que son amamantados.	□	□	□	□	□
21. Los bebés amamantados son más inteligentes que los bebés alimentados con leche de fórmula.	□	□	□	□	□
22. Los bebés amamantados crecen mejor que los bebés alimentados con leche de fórmula.	□	□	□	□	□
23. Los bebés disfrutan de la lactancia materna más que la alimentación con leche de fórmula.	□	□	□	□	□
24. La leche materna es más barata que la de fórmula.	□	□	□	□	□
25. Amamantar es más conveniente que la alimentación con leche de fórmula.	□	□	□	□	□
26. Alimentar con leche de fórmula da más libertad a la madre.	□	□	□	□	□
27. Amamantar al bebé es doloroso.	□	□	□	□	□
28. Amamantar puede hacer que se hundan los pechos.	□	□	□	□	□
29. Las madres deben destetar a sus bebés antes de regresar al trabajo o a la escuela.	□	□	□	□	□

30. Ver a una mujer amamantar en público, por ejemplo en el centro comercial, me incomoda.	□	□	□	□	□
31. Ver imágenes de una mujer amamantando, por ejemplo en la televisión o en una revista, me incomoda.	□	□	□	□	□
32. Amamantar solo debe ocurrir frente a familiares y amigos.	□	□	□	□	□
33. Amamantar en público es aceptable.	□	□	□	□	□
34. Me sentiría avergonzado(a) si mi pareja o yo amamanta en público.	□	□	□	□	□
35. Respeto a las mujeres que amamantan.	□	□	□	□	□

36. ¿Ha aprendido usted en la escuela o la universidad acerca de la lactancia materna?
Por ejemplo en una clase de Ciencias Naturales o de Biología o Anatomía o Fisiología…
☐ Si ☐ No ☐ Inseguro

36a. Si usted respondió 'Si' en la pregunta 36, ¿Qué edad tenía cuando recibió ese conocimiento?_____

37. ¿Conoce a alguien que ha amamantado a un bebé?
☐ Si ☐ No ☐ Inseguro

38. ¿Alguna vez ha visto en persona a una mujer amamantando su bebé?
☐ Si ☐ No ☐ Inseguro

39. ¿Usted fue amamantado de bebé?
☐ Si ☐ No ☐ Inseguro

39a. Si usted respondió 'Si' o 'No' a la pregunta 39, diga cómo lo sabe

_____

39b. Si usted respondió 'Inseguro' a la pregunta 39 esto se debe a:
☐ Nunca ha considerado preguntar acerca del tema
☐ Ha considerado preguntar, pero nunca lo ha hecho
☐ Otra razón: _____

Marque la respuesta que representa mejor su opinión. Seleccione solo una.
40. La decisión de amamantar debe ser…
☐ Enteramente de la madre del bebé
☐ Fundamentalmente de la madre con participación del padre del bebé
☐ De la madre del bebé con participación de la abuela materna
☐ De la madre del bebé con participación de ambas abuelas
☐ Una decisión conjunta entre la madre y el padre del bebé
☐ Fundamentalmente del padre del bebé con participación de la madre del bebé
☐ Otra, especifique_____

41. Los médicos en Honduras recomiendan que las madres alimenten a los bebés exclusivamente con leche materna.
¿Por cuánto tiempo considera que debe ser así? Seleccione solo una respuesta.

☐ Un día ☐ Una semana ☐ Un mes ☐ Tres meses ☐ Seis meses
☐ Nueve meses ☐ Por lo menos un año ☐ No lo sé ☐ Otro:_____

42. ¿Cuánto tiempo recomiendan los médicos en Honduras que las madres amamanten al bebé a partir de que consume alimentos sólidos en su dieta? Seleccione solo una respuesta.

☐ Un día ☐ Una semana ☐ Un mes ☐ Tres meses ☐ Seis meses
☐ Nueve meses ☐ Por lo menos un año ☐ No lo sé ☐ Otro: ____

43. Si una madre deja de amamantar completamente al bebé y cambia a leche de fórmula y se arrepiente ¿cuánto tiempo puede pasar antes de que su cuerpo deje de producir leche? Seleccione solo una respuesta

☐ 24 horas ☐ 48 horas ☐ Una semana ☐ Tres semanas
☐ Un mes ☐ Dos meses ☐ No lo sé ☐ Otro: _____

44. ¿Se imagina como padre o madre en el futuro?

☐ Si ☐ No ☐ No he pensado en ello
☐ He pensado en ello, pero estoy inseguro/a ☐ Ya soy un padre o madre

45. ¿En el futuro usted amamantaría a su bebe o apoyaría a su pareja para que amamante?

☐ Si ☐ No ☐ No he pensado en ello ☐ He pensado en ello, pero estoy inseguro

45a. Si respondió 'Si' a la pregunta 46, ¿Cuánto tiempo estaría de acuerdo con que se amamante al bebé?

☐ Un día ☐ Una semana ☐ Un mes ☐ Tres meses ☐ Seis meses
☐ Nueve meses ☐ Por lo menos un año ☐ No sé ☐ Otro: ____

¡Gracias por su participación!

Appendix E. Questionnaire for Undergraduate Students (English)

UNAH
UNIVERSIDAD NACIONAL AUTÓNOMA DE HONDURAS

THE UNIVERSITY OF TENNESSEE KNOXVILLE

A survey of breastfeeding knowledge and attitudes of university students

Please note that the return of this questionnaire will constitute your informed consent to participate. All the information will be kept confidential.

Please answer the following questions: check the box, circle your response, or write in your answer.

1. Gender: ☐ Male ☐ Female

2. How old are you, in years? _____ years

3. What is your racial background? (**Choose all that apply**)

☐ Garífuna ☐ Nahoa ☐ Mestizo ☐ Otro:_____

☐ Tolupan ☐ Tawaka (Sumo) ☐ Lenca

☐ Misquito ☐ Maya Chorti ☐ No Sabe

4. What is your major or intended major? (*Examples of "health-related" majors include pre-med, pre-pharmacy, pre-dental, nursing, nutrition, and exercise science. Examples of "non-health-related" majors include accounting, English literature, engineering, and math.*)

☐ Health Related ☐ Non-Health Related

☐ If you are unsure, tell us what it is and we can classify it for you: _____

5. What is your class-standing?

☐ First Year ☐ Second Year ☐ Third Year ☐ Fourth Year ☐ Fifth Year

6. What part of Honduras are you from?_____

For the following questions, please choose "TRUE (T)", "FALSE (F)" or "I don't know (IDK)"	T	F	IDK
7. Breastfeeding should be started within the first hour after birth.	□	□	□
8. The first food for babies should be breast milk.	□	□	□
9. Breastfeeding alone typically provides sufficient nutrition for babies for the first 6 months of life.	□	□	□
10.. The nutrients in breast milk and infant formula are the same.	□	□	□
11. Breastfeeding helps prevent respiratory infections in the baby.	□	□	□
12. Formula-fed babies may suffer from more illnesses than breastfed babies.	□	□	□
13. The benefits of breastfeeding for babies continue even after weaning.	□	□	□
14. Breastfeeding will help a mother feel closer to her baby.	□	□	□
15. Women who have breastfed have a lower risk of breast cancer.	□	□	□
16. Breastfeeding prevents a woman from returning to her pre-pregnancy weight.	□	□	□
17. Most women can make enough breast milk to adequately feed their baby.	□	□	□
18. Women who have small breasts cannot make enough breast milk.	□	□	□
19. Alcohol is passed from the mother's body to breast milk.	□	□	□

Please check an option for each of the following statements.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
20. Formula-fed babies are more likely to be overfed than breastfed babies.	□	□	□	□	□
21. Breastfed babies are smarter than formula-fed babies.	□	□	□	□	□
22. Breastfed babies grow better than formula-fed babies.	□	□	□	□	□
23. Babies enjoy breastfeeding more than formula-feeding.	□	□	□	□	□
24. Breast milk is cheaper than formula.	□	□	□	□	□
25. Breastfeeding is more convenient than formula feeding.	□	□	□	□	□
26. Formula feeding gives more freedom to the mother.	□	□	□	□	□
27. Nursing a baby is painful.	□	□	□	□	□
28. Breastfeeding can make breasts sag.	□	□	□	□	□
29. Mothers should wean their babies before they return to work or school.	□	□	□	□	□
30. Seeing a woman breastfeeding in public (ex: at the mall) makes me uncomfortable.	□	□	□	□	□
31. Seeing media representation of a women breastfeeding (ex: on TV, in a magazine) makes me uncomfortable.	□	□	□	□	□
32. Breastfeeding should only be done around friends and family.	□	□	□	□	□
33. Breastfeeding in public is acceptable.	□	□	□	□	□
34. I will feel embarrassed if I/my partner breastfeed(s) in public.	□	□	□	□	□
35. I respect women who breastfeed.	□	□	□	□	□

36. Have you previously learned about breastfeeding as part of formal instruction? (ex: during a biology class, anatomy/physiology class, etc.)
☐ Yes ☐ No ☐ Unsure

36a. If you answered '**Yes**' to #36, how old were you when you received this formal instruction?_____

37. Do you know someone who has breastfed a baby?
☐ Yes ☐ No ☐ Unsure

38. Have you ever witnessed a woman breastfeeding her baby in person?
☐ Yes ☐ No ☐ Unsure

39. Were you breastfed when you were a baby?
☐ Yes ☐ No ☐ Unsure

39a. If you answered '**Yes**' or '**No**' to #39, please describe how you know this
_____

39b. If you answered '**Unsure**' to #39, is this because you have never considered asking about this, have considered asking but just never have asked, or is there some other reason? If another reason, please describe.:
☐ I have never considered asking about this
☐ I have considered asking but never have asked
☐ Other: _____

Check the box that best represents how you feel about the following statement:
(Choose only one)
40. The decision to breastfeed should be…
☐ Left entirely up to the baby's mother
☐ Left mostly up to the baby's mother, with input from the baby's father
☐ Left mostly up to the baby's mother, with input from her own mother
☐ Left mostly up to the baby's mother, with input from both of the baby's grandmothers
☐ A joint decision by the baby's mother and father
☐ Left mostly up to the baby's father, with input from the baby's mother
☐ Other: _____

41. Doctors in Honduras recommend babies receive only breast milk (***be exclusively breastfed***) for a certain amount of time.
How long do doctors say a baby should be exclusively breastfed/receive only breast milk?
(Choose only one)

☐ 1 day ☐ 1 week ☐ 1 month ☐ 3 months ☐ 6 months
☐ 9 months ☐ At least 1 year ☐ I don't know ☐ Other: _____

42. How long do doctors in Honduras recommend mothers continue to breastfeed after introducing solid foods to their baby's diet? **(Choose only one)**

☐ 1 day ☐ 1 week ☐ 1 month ☐ 3 months ☐ 6 months
☐ 9 months ☐ At least 1 year ☐ I don't know ☐ Other: _____

43. If a mother stops breastfeeding completely, and switches entirely to formula, how much time does she have before she can no longer easily breastfeed (if she decided to switch back from formula)? **(Choose only one)**

☐ 24 hours ☐ 48 hours ☐ 1 week ☐ 3 weeks
☐ 1 month ☐ 2 months ☐ I don't know ☐ Other: _____

44. Do you see yourself as a parent in the future?

☐ Yes ☐ No ☐ I have not thought about it
☐ I have thought about it but am unsure ☐ I am already a parent

45. Would you breastfeed/support your partner to breastfeed your baby in the future?

☐ Yes ☐ No ☐ I have not thought about it ☐ I have thought about it but am unsure

45a. If you answered "**Yes**" to #45, how long would you be comfortable with your baby breastfeeding?

☐ 1 day ☐ 1 week ☐ 1 month ☐ 3 months ☐ 6 months
☐ 9 months ☐ At least 1 year ☐ I don't know ☐ Other: _____

Thank you for your participation!

VITA

Mariana Rendon was born in Xalapa, Veracruz, Mexico and grew up in Tegucigalpa, Francisco Morazán, Honduras. She graduated from Michigan State University in December 2011 with a Bachelor of Science degree in Genomics and Molecular Genetics. In August 2015, she began graduate school at the University of Tennessee-Knoxville to obtain a Master of Science degree in Public Health Nutrition and a Master of Public Health with a concentration in Community Health Education. As a graduate student, she was a member of the Infant Child and Adolescent Nutrition (ICAN) Lab, under the supervision of Dr. Katherine F. Kavanagh, where she contributed to ongoing research concerning maternal and child nutrition.