

Knowledge and Attitudes towards Breastfeeding among Unmarried Female Graduates at the University of Jordan

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ABSTRACT

Introduction: Breast milk is the primary source of nutrition for infants. It provides numerous health benefits to both mothers and infants. This study aimed to determine knowledge and attitudes toward breastfeeding among unmarried, young, female graduates of the University of Jordan. **Methods:** A total of 627 female graduates aged 23.2 ± 0.8 years were recruited from different faculties of the University of Jordan to participate in this study. The study participants were given a validated questionnaire based on the Iowa Infant Feeding Attitude Scale. It consisted of 14 items on knowledge and 8 items on attitudes toward breastfeeding. **Results:** There was a remarkable discordance in the responses of the participants between their knowledge and attitude towards breastfeeding. Whilst 94% of them stated they knew that breast milk is the best food for infants, and 91% agreed that breastfeeding is a valued tradition that mothers should maintain, 99% stated that they would prefer bottle-feeding over breastfeeding as breastfeeding was an old feeding practice. More than 61% agreed that human breast milk is easily digested when compared to formula milk, and 65.9% indicated that they knew that formula-fed babies were more likely to be overfed than breastfed babies ($P=0.01$). Moreover, 83% of them indicated that mothers should not breastfeed in public places such as restaurants. Mean level of knowledge score of female graduates from health faculties was moderate compared to the low level among graduates from both scientific and humanitarian faculties ($P=0.012$). **Conclusion:** Although a certain level of positive knowledge about breastfeeding existed among a group of young women graduates of the University of Jordan, their attitudes towards breastfeeding practices were negative. This is an important area for policy makers in order to build capacity of people to support the practice of breastfeeding and consequently increase the rate of both breastfeeding initiation and overall breastfeeding duration.

Key words: Attitudes, breastfeeding, health, Jordan, knowledge, policy, university students

INTRODUCTION

Human breast milk is the optimal source of nutrition for infants. It provides numerous health benefits to both mothers and infants including the metabolic and immunological programming of infants. Breast milk also has a wide range of bioactive elements, including a diverse non-contaminant bacterial community. Moreover, human

milk is a time and cost-effective feeding method. It also promotes optimal physical and cognitive development, reduces childhood morbidity and mortality, and enhances mother and child bonding (Cabrera-Rubio *et al.*, 2012; Naanyu, 2008).

Breastfeeding was among the 10-year health goals and objectives of the final review of Healthy People 2010. It was

set to increase the proportion of children ever breastfed from 64% to 75%, breastfed infants at six months of age from 29% to 50%, and breastfed children at one year of age from 16% to 25% (National Center for Health Statistics, 2012). While the objectives of the World Health Organisation (WHO) regarding the rate of initiation and the overall duration of breastfeeding have been achieved (Bertino *et al.*, 2012), the rate of exclusive breastfeeding has not met the acceptable levels at six months of age in both developing and developed countries (Fairbrother & Stranger-Ross, 2010).

In western societies, low breastfeeding initiation and continuity are attributed to socio-cultural variables such as lack of family, community, and workplace support for breastfeeding as well as religious perceptions. Urbanisation is often accompanied by a shift in the availability and accessibility of foodstuffs, including infant formula, which often displaces local or traditional food items and habits, causing a possible negative impact on health status (Al-Domi, 2015; Cleminson *et al.*, 2014; Betoko *et al.*, 2013). People in developing countries are aware of certain features of affluent lifestyles. Despite religious recommendations supporting breastfeeding in Islamic societies, some countries such as the United Arab Emirates aggressively publicise and market infant formulae, thus influencing breastfeeding practice (Mousa *et al.*, 2009).

Maternal attitude towards breastfeeding is the single factor independently linked to the duration of breastfeeding for the entire first year of life (Bertino *et al.*, 2012), which is affected by a range of factors including social assistance, maternal education, social class, and ethnic background (Demirtas *et al.*, 2012; Khassawneh *et al.*, 2006). Reports from Jordan, Mediterranean countries (Oweis, Tayem, & Froelicher, 2009; Khassawneh, *et al.*, 2006), and Canada (Chalmers *et al.*, 2009) demonstrated that the levels of

initiation and continuity of breastfeeding vary depending on the level of knowledge, and attitudes of both mothers and young unmarried female students.

Deciding to breastfeed before or during pregnancy is associated with higher rates of breastfeeding initiation and duration rates (Cattaneo *et al.*, 2009). Although more than 94% of breastfeeding Jordanian mothers initiated breastfeeding at birth in 2009, only 32% of infants aged less than four months were exclusively breastfed, and only 11% of children aged 20 to 23-months continued to be breastfed (Department of Statistics & ICF International, 2013). Although women decided to breastfeed for various reasons, knowledge is the only significant predicting factor for future decisions to breastfeed, whereas attitudes toward breastfeeding are strong predictors of infant feeding than the usually mentioned socio-demographic factors (Fairbrother & Stranger-Ross, 2010).

There is a large spectrum of influence on breastfeeding trends in Jordan and as part of efforts to increase the proportion and duration of breastfeeding, it is vital to assess the levels of knowledge, and attitudes toward breastfeeding, particularly among women of childbearing age. This group's knowledge and attitudes towards breastfeeding could influence future breastfeeding trends in Jordan if they chose to have children. Hence, the objective of this study was to evaluate the levels of knowledge on, and attitudes toward, breastfeeding among a group of young, unmarried Jordanian university students.

METHODS

Human participants

This study used cross-sectional analysis of participants at the University of Jordan, Jordan, using the sample size equation provided by Oveson (2006). The participants were 618 unmarried female graduates. The mean age of participants

was 23.2 ± 0.8 -years. Participants were selected randomly from all faculties of the University of Jordan during the graduation rehearsals for the academic year 2012-2013. This study only included female students who were eligible for graduation by the end of the academic year and who were Jordanian citizens. This study excluded married, divorced or widowed female students. Graduates were categorised according to their faculties into three groups, namely health sciences (28.7%), sciences (34.8%), and humanitarian sciences (36.5%).

Participating students were categorised according to their family size into three groups, namely, <6 family members (29.3%), 7-8 family members (40.2%), and >8 family members (30.5%). Self-reported questionnaires were given to this study's participants to complete. Participants were recruited by direct contact, via group presentations, and via internet notices. Additionally, advertisements, flyers, information sheets, and notices about the study, approved by the Dean of Academic Affairs, were posted on various faculty bulletin boards.

Ethical approval

Upon gaining verbal consent, an information sheet explaining the general background of the study was given to all participants to this study. The participants were also given brief verbal explanations regarding the research objectives. The Higher Committee of the Faculty of Academic Research at the University of Jordan approved the protocol of this study.

Study tool

This study used a survey questionnaire divided into two main groups, namely questions regarding knowledge of breastfeeding, and questions on the attitudes toward breastfeeding. Fourteen questions on the knowledge of breastfeeding were developed based

on available nutritional data, nutritional needs of breastfeeding, and cultural understanding of breastfeeding among Jordanian women. Eight questions on attitudes toward breastfeeding were based on the Iowa Infant Feeding Attitude Scale (IIFAS) (de la Mora *et al.*, 1999). About half of the questions were set to determine positive knowledge or positive attitude toward breastfeeding, whereas the remaining questions favoured formula feeding. Responses to questions that favoured formula feeding were reversed scored. Participants responded to the multiple-choice questions by selecting the best choice among a set of four options. A total score for knowledge and attitude was computed per participant via an equally weighted sum of their responses to each individual question. The proportion of students' responses for each question was also computed. One proportion was equivalent to one reference point on a 100-point reference scale, and enabled the levels of knowledge and attitude to be determined. Levels of knowledge and attitude were determined by grouping computed knowledge and attitude scores into five levels, namely extremely low (scores <50), very low (scores 50 to <60), low (scores 60 to <70), moderate (scores 70 to <80), high (scores 80 to <90), and very high (scores 90 to 100).

Validity and reliability

A panel of academics in maternal nutrition, nursing, parents and university students assessed the validity of the content of the questionnaire, and their comments were used to revise and further develop the questionnaire. The IIFAS questions were translated into Arabic. Moreover, the developed tool was standardised and assessed for meeting Jordanian cultural norms via a pilot study; 34 unmarried female participants were selected randomly from various university faculties for the pilot study. The estimated value of

internal consistency and reliability of the developed questionnaire was 0.81 (Mousa *et al.*, 2009).

Statistical analysis

Data was processed and analysed using the Graduate Pack SPSS 12.0 for Windows 2003 (Chicago, Inc). ANOVA was used to examine the differences among participants by comparing pairs of means for continuous variables, and chi-squared tests for categorical variables. Logistic linear regression models were used to examine the association between breastfeeding knowledge and a number of demographic characteristics. Data were presented as means \pm standard deviation (SD), and frequency distributions. The degree of internal consistency of ordinal scales was determined using Cronbach's alpha statistics. *P* values less than 0.05 were considered significant.

RESULTS

Findings on graduates' knowledge of breastfeeding versus formula feeding are shown in Table 1. There was a significant difference ($P=0.01$) between participants' knowledge scores. In general, the majority of participants had high to very high levels of knowledge regarding the suitability of breastfeeding for babies over that of formula feeding (items 1, 2, 3, and 4). More than two-thirds of the participants agreed that a lactating mother needs extra calories to maintain an abundant milk supply and that breastfeeding is cheaper than formula which indicated a moderate level of knowledge.

More than 69.8% of the participants, pointed out that a lactating mother can still adequately breastfeed her baby even if she does not have enough breast milk, which indicates a low level of knowledge. Whereas, 61.6% of participants agreed that human breast milk is easily digested as compared to formula milk, and 65.9% of them indicated that they knew that formula-

fed babies are more likely to be overfed than breastfed babies ($P=0.01$). Interestingly, about 68% of the participating graduates agreed that colostrum is important for the health of the infant and serves as the first immunisation for the baby, indicating a low level of knowledge on the health benefits of the colostrum. In contrast, 72.7% stated incorrectly that infant formula contains antibodies that protect against diseases. Major variability in the responses of participants to the various questions is shown in Table 2. The majority of graduates agreed that formula feeding is less convenient than breast milk. However, they also agreed that breastfeeding is a valued tradition that mothers should maintain, indicating a very high level of positive attitude toward breastfeeding. Although 80% of participants believed that breastfeeding is the best feeding practice for the baby, 86% found breastfeeding acceptable during the night sleeping hours. Of the eight attitude items tested, the responses of the participants to five items revealed negative or very negative attitudes toward breastfeeding. Only 1.1% of participants agreed that formula feeding is less convenient than breastfeeding since it is easier to practice. Similarly, a mere 2.6% of the participants disagreed that formula feeding is the best choice for the working mother. In this context, 83% of them indicated that mothers should not breastfeed in public places such as restaurants. Furthermore, a weak positive and significant relationship was found between the knowledge scores and the attitudes scores ($P<0.01$) as shown in Figure 1.

There were no significant differences among the participants' mean level of knowledge toward breastfeeding when grouped by their university faculty or family size ($P=0.012$ and 0.013 , respectively). The mean level of knowledge scores of participants from the health sciences was moderate compared to low level scores

Table 1. Knowledge of breastfeeding among a group of unmarried young University of Jordan University graduates of childbearing age (n=627)

Knowledge items*†	Score of knowledge‡ n(%)	Level of knowledge	P-value
Breast milk is ideal for babies	590(94.1)	Very high	0.01
Breastfed babies are healthier than formula fed babies	578(92.2)	Very high	
Mixed feeding (meaning breastfeeding and giving other foods and liquids) before six months can cause diarrhoea, respiratory, and ear infections	549(87.5)	High	
Young children should be breastfed for at least 2 years	525(83.8)	High	
Breast milk is cheaper than formula	479(76.4)	Moderate	
Lactating mother needs extra calories to maintain an abundant milk supply	466(74.4)	Moderate	
At 4 months, a mother should begin to add solid foods in addition to breast milk‡	182(29.1)	Moderate	
Even if a mother believes she does not have enough breast milk, she can still be able to adequately breastfeed her baby.	§RS 445(70.9)		
Colostrum is important for the health of the infant and serves as the first immunisation for the baby	438(69.8)	Low	
Breast milk is more easily digested than formula	428(68.2)	Low	
Formula-fed babies are more likely to be overfed than breast fed babies‡	386(61.6)	Low	
Infant formula contains antibodies that protect against diseases, especially against diarrhoea, respiratory, and ear infections‡	214(34.1)		
After 6 months, it is good to only breastfeed‡	§RS 413 (65.9)	Extremely low	
In the first six months, the infant needs water and/or other liquids or solid foods in addition to breast milk‡	456 (72.7)		
Mean knowledge score	§RS 171(27.3)	Low	
	369(58.8)	Extremely low	
	§RS 258(41.1)		
	342(54.5)	Extremely low	
	§RS 285(45.5)		

* Results do not tally to 100% due to multiple responses for different items.

† Data are presented as frequency (%) and are considered statistically significant at P<0.05

‡ Levels of knowledge were determined based on the assumption that one proportion is equivalent to one reference point on a 100-point reference scale.

§ Knowledge items that favoured formula feeding.

§ To determine the level of negative-knowledge of breastfeeding, knowledge items that favoured formula feeding were reverse-scored. RS- reverse score of the tested items.

Table 2. Attitude levels towards breastfeeding among a group of young unmarried University of Jordan graduates of childbearing age (n=627).

Attitude items ^{††}	Score of attitude [‡] n (%)	Level of positive attitudes	P-value
Breastfeeding is a valued local tradition that mothers should maintain	563 (91.0)	Very high	0.001
Breastfeeding is accepted during night sleeping hours	491 (86.6)	High	
Breastfeeding is the best feeding practice for the baby	495 (80.0)	High	
Formula feeding is more convenient than breastfeeding since it is easier to practice [‡]	620 (98.9) [§] RS 7(1.1)	Extremely low	
Formula feeding is the best choice if the mother plans to go out to work [‡]	611 (97.4) [§] RS 16 (2.6)	Extremely low	
Fathers feel left out if a mother breastfeeds [‡]	369 (58.8) [§] RS 258 (41.2)	Extremely low	
Mothers who formula feed miss one of the great joys of motherhood [‡]	591 (94.3) [§] RS 36 (5.7)	Extremely low	
Mothers should not breastfeed in public places such as restaurants [‡]	523 (83.4) [§] RS 104 (16.6)	Extremely low	
Mean attitudes score	246 (39.3)	Extremely low	

* Results do not tally to 100% due to multiple responses for these categories.

† Data are presented as frequency (%) and are considered statistically significant at P<0.05

‡ Levels of positive and negative attitude were determined based on the assumption that one proportion is equivalent to one reference point on a 100-point reference scale.

§ Attitude items that favoured formula feeding.

¶ To determine the level of negative-attitude toward breastfeeding, attitude items that favoured formula feeding were reverse-scored. RS- reverse score of the tested items.

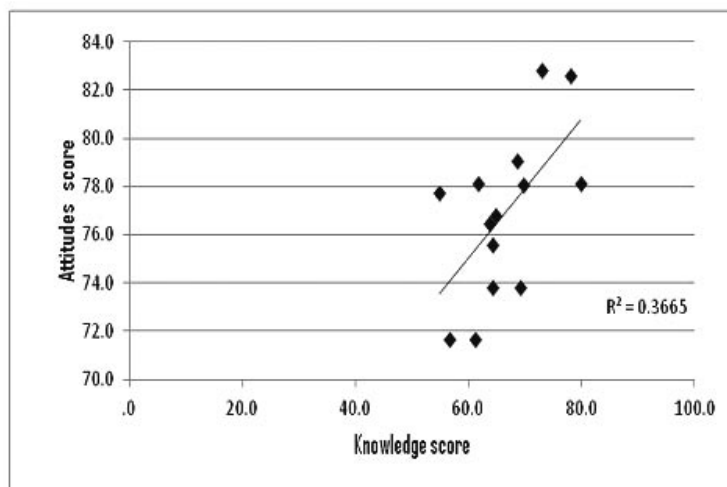


Figure 1. Correlation between graduates' breastfeeding knowledge and attitudes scores

Table 3. Comparison between mean knowledge and attitudes scores according to faculty category and family size.

Variables*		Knowledge		P-value	Attitudes [†]		P-value
		Mean score (±SD)	Level		Mean score (±SD)	Level	
Faculty	Health sciences (n=180)	72.6 ± 16.1	Moderate	0.012	81.2 ± 14.4	High	0.051
	Scientific (n=229)	69.2 ± 18.4	Low		78.7 ± 13.8	Moderate	
	Humanitarian (n=218)	66.9 ± 18.9	Low		69.9 ± 14.1	Low	
Family size	<6 members (n=184)	65.3 ± 17.7	Low	0.013	78.1 ± 8.2	Moderate	0.054
	7-8 members (n=252)	70.4 ± 17.9	Moderate		76.8 ± 8.7	Moderate	
	>8 members (n=191)	72.5 ± 17.1	Moderate		87.1 ± 10.1	High	

*Data are presented as mean± SD and are considered statistically significant at P<0.05.

of participants from both the sciences and humanitarian sciences ($P=0.012$). In relation to attitude, the mean scores of the participants from the health sciences, sciences and humanitarian sciences were high, moderate and low, respectively ($P=0.051$). Participants who had either less than 6 members in their family or 7-8 family members had moderate attitude scores, whereas participants with more than 8 family members had high attitude scores ($P=0.054$).

DISCUSSION

Breastfeeding is a natural process contributing to the health of infants. Regardless of increasing knowledge, rates of breastfeeding remain relatively unchanged and mothers continue to show discontent with their experience of breastfeeding. Therefore, rigorous research is critical to achieve a better understanding, which is essential to support, promote, and maintain high breastfeeding rates (Bertino *et al.*, 2012).

This study found that there was a significant difference among participants in relation to levels of both knowledge

and attitudes toward breastfeeding (refer to Tables 1 and 2). Noticeably, the mean scores of knowledge and attitude were 68.4 and 39.3, respectively. This signified a low level of knowledge, and extreme negative attitudes. Findings of studies on knowledge and/or attitudes toward breastfeeding vary widely. A Korean study among university students demonstrated low levels of knowledge but highly positive attitudes towards breastfeeding, (Kang, Song & Im, 2005). Furthermore, an American study has shown that males and female undergraduate students had positive attitudes to breastfeeding (Marrone, Vogeltanz-Holm & Holm, 2008), but Indonesian female students studying in Australian universities lacked basic knowledge on breastfeeding (Tjiang & Binns, 2001).

The vast majority of participants in this study agreed that breast milk is the best food for babies they may have in the future, and that breastfed babies are healthier than formula-fed babies (94%, 92%; respectively, $P=0.01$), denoting a very high level of knowledge on breastfeeding. These findings are consistent with those

reported in a study conducted on male and female university students in Hong Kong (Tarrant & Dodgson, 2007) and Saudi female college students (Bella, 1997). In contrast, 46.6% of Canadian female university undergraduates believed that human breast milk is the only ideal food for babies during the first six months of life (Fairbrother & Stranger-Ross, 2010). A cross-sectional study on knowledge, attitudes and practices of breastfeeding women in northern Jordan showed that married women with higher education were less likely to breastfeed their infants. This could negatively influence the positive local traditions that facilitate and promote breastfeeding, if policy makers take no appropriate measures (Oweis *et al.*, 2009; Khassawneh *et al.*, 2006).

Although the findings of this study demonstrated that 91% of the participants agreed that breastfeeding is a valued tradition that mothers should maintain, 98.9% of them indicated that bottle-feeding is more convenient as it is easier to practise, which indicated an extremely negative attitude towards breastfeeding. Korean, Canadian, Saudi Arabian, and Kuwaiti studies report that despite limited knowledge, university students exhibited positive attitudes and support of the idea that education and public health campaigns may benefit the normalisation of breastfeeding (Fairbrother & Stranger-Ross, 2010; Kang *et al.*, 2005; Bella, 1997).

Whilst about two-thirds of the participants knew that solids should not be introduced to breastfeeding infants before four months of age, more than half of them assumed that the infant needed water and/or other liquids or solid foods in addition to breast milk in the first six months after birth. This level of knowledge could explain the findings of Khassawneh *et al.* (2006), who stated that of the 88.6% of women from northern Jordan who initiated breastfeeding, only about a half

of them provided full breastfeeding and less than one-third of them provided mixed breastfeeding. Mothers who had a low level of knowledge may believe that breast milk is not sufficient to meet the nutritional requirements of their infants, and may provide infant formula along with breastfeeding; they also tend to introduce solid foods earlier (Abdul Ameer, Al-Hadi & Abdulla, 2008).

The findings of this study showed that graduates from the health sciences had higher levels of knowledge and more positive attitudes toward breastfeeding than graduates from the sciences and humanitarian sciences. Studies in developed countries reported that education has a positive effect on breastfeeding (Di Napoli *et al.*, 2006; Lanting, Van Wouwe & Reijneveld, 2005). Low education significantly influences initial breastfeeding practice, and shortened the durations of breastfeeding (Kohlhuber *et al.*, 2008). Furthermore, the findings of this study showed that participants from large sized families had higher levels of knowledge and more positive attitudes towards breastfeeding than those from smaller families. These results are consistent with previous studies that show a negative relationship between household size and ready-prepared foods (Betoko *et al.*, 2013). The majority of the participants (40%) came from average-sized families (7-8 persons). Jordan has undergone considerable social developmental changes that have affected the cultural norms, particularly for those who live in its capital, Amman, the most populous and the most urbanised city in Jordan. The cultural changes have led to a widespread adoption of Western habits, yet Jordanians still favour a larger family size with both total and adolescent fertility rates remaining high (Mousa, 2009; WHO, 2009).

This study found a significant, weak relationship between the knowledge and attitude scores. 'Structural shifts'

in the determinants of breastfeeding could be attributed to recent changes due to modernisation, which could be influencing traditional infant feeding practices (Oweis *et al.*, 2009). The extent to which an individual is exposed to breastfeeding in public settings is linked to attitudes that are more positive and increased intention to breastfeed (Spurles & Babineau, 2011). Psychological barriers may cause poor motivation to breastfeed, and therefore see the early introduction of a substitute formula (Abdul Ameer *et al.*, 2008). Hence, national longitudinal studies should be undertaken to evaluate and understand the levels of knowledge of breastfeeding among unmarried young Jordanian females to develop and evaluate health promotion programmes aimed at improving the knowledge of and attitudes towards breastfeeding, and supporting and maintaining breastfeeding initiation and continuity.

The main limitation of this study is that the sample was limited to participants from the University of Jordan, and therefore the findings of this study cannot be generalised to a larger population. However, the University of Jordan has more than 34,000 students who represent diverse backgrounds and are drawn from all over the country. Jordan's national university admission policies make it compulsory for all public universities to accept students through a quota system based on free competition. This system allows students from the less privileged regions to access the various faculties and departments throughout Jordan. Hence, the findings of this study could be of benefit to researchers and policy makers. However, the findings must be toned to be replicated for different contexts and surroundings in future studies.

CONCLUSION

The findings of this study suggest that unmarried young Jordanian female university students had inconsistent levels of knowledge and attitudes towards breastfeeding. Although positive knowledge about breastfeeding was identified among them, their attitudes towards breastfeeding practices were negative. Moreover, a weak positive relationship was observed between the knowledge scores and the attitudes scores. Hence, knowledge alone might not be sufficient to prepare future mothers to practice breastfeeding. This requires the concerted efforts by policy makers to develop health promotion programmes aimed at improving both knowledge and attitudes to support and maintain breastfeeding among women of childbearing age.

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