

## Original Article

# Knowledge and Attitudes toward Breastfeeding among Female University Students in Tabuk, Saudi Arabia

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### ABSTRACT

**Background:** In Saudi Arabia, rates and duration of breastfeeding are progressively declining. **Objective:** The objective of this study was to examine and describe the relationship between breastfeeding knowledge, attitudes, exposure, and intention of university female students in Saudi Arabia. **Methods:** This cross-sectional survey recruited 124 students who completed a self-reported questionnaire. The questionnaire included breastfeeding knowledge, attitude and exposure scales, and a breastfeeding intention scale. Descriptive and inferential statistics were used to analyze the data. **Results:** Participants had good breastfeeding knowledge (mean score of  $9.51 \pm 2.63$ ) and positive attitudes (mean score of  $42.0 \pm 1.8$ ). However, they had some misconceptions about eating certain foods during breastfeeding and that breastfeeding is painful. A significant relationship was found between breastfeeding knowledge and attitude ( $r = 0.896$ ,  $P < 0.01$ ), breastfeeding knowledge and exposure ( $r = 0.191$ ,  $P < 0.01$ ), breastfeeding knowledge and intention to breastfeed (Phi coefficient=0.179,  $P = 0.033$ ), and breastfeeding attitudes and intention to breastfeed (Phi coefficient=0.177,  $P = 0.030$ ). Participants' knowledge (OR=3.280;  $P < 0.001$ ) and attitude (OR=1.930;  $P < 0.001$ ) were identified as factors independently and positively associated with future breastfeeding intention. **Conclusion:** The study identified specific gaps in knowledge and attitudes that pertain mainly to breastfeeding in public and perceptions that breastfeeding is painful, formula feeding gives more freedom to the mother, and that dietary restrictions by the mother during breastfeeding are needed. These gaps should be addressed in future breastfeeding promotion.

**KEYWORDS:** Attitude, Breastfeeding, Knowledge, Saudi Arabia, University students

## INTRODUCTION

Breastfeeding is promoted as the best method of infant feeding and one of the most cost-effective ways to stimulate healthy infant growth and development.<sup>[1,2]</sup> Furthermore, breastfeeding benefits mothers, through postpartum weight loss, reduction in breast and ovarian cancer, and enhanced mother–infant attachment.<sup>[3]</sup> Since 2001, the World Health Organization (WHO) has recommended exclusive breastfeeding for the first 6 months of life.<sup>[4]</sup> Despite advantages, the proportion of countries that meet these recommendations remains low.<sup>[5,6]</sup> One of the global

targets endorsed by the WHO's member states is to increase the rate of exclusive breastfeeding in the first 6 months up to at least 50%.<sup>[7]</sup>

In Saudi Arabia, rates and duration of breastfeeding are progressively declining.<sup>[6,8]</sup> The breastfeeding initiation rate in 2016 was above 90%; however, exclusive breastfeeding rates at 6 months ranged between 0.8% and 43%. The mean duration of breastfeeding has shown

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a progressive decline over time from 13.4 months in 1987 to 8.5 months in 2010.<sup>[6,8,9]</sup>

Studies of poor breastfeeding outcomes mainly focused on the knowledge and attitudes of pregnant women and mothers.<sup>[10,11]</sup> Studies suggest that attitudes toward breastfeeding begin well before pregnancy and decisions concerning breastfeeding are often made early in life;<sup>[12]</sup> therefore, research examining attitudes before pregnancy is important. Identifying predictors of breastfeeding intentions facilitate the design of effective breastfeeding promotion interventions.

Several studies in Western countries have been assessed the attitudes of young populations toward breastfeeding.<sup>[13,14]</sup> Knowledge and attitudes regarding breastfeeding among university students vary across countries. A study of university students in Lebanon and Syria showed average breastfeeding knowledge and positive attitudes among participants, and breastfeeding intention was significantly associated with knowledge and attitude.<sup>[15]</sup> In another study in Jordan,<sup>[16]</sup> university students showed a positive level of breastfeeding knowledge, but their attitudes toward breastfeeding practices were negative.

In Saudi Arabia, data regarding the breastfeeding attitudes and knowledge among young people are limited,<sup>[17]</sup> and more research is needed to understand which factors have the greatest impact on breastfeeding intentions among Saudi women. Greater insight into the factors that may transform breastfeeding decisions in a young Saudi population could assist health agencies to promote breastfeeding and implement successful strategies and encourage the development of effective breastfeeding-friendly policies that are specific to Arab countries.<sup>[17,18]</sup>

## Objective

This study aimed to examine the relationship between breastfeeding knowledge, attitudes, exposure, and intention of university female students in Saudi Arabia.

## METHODS

### Design, setting, and participants

A cross-sectional survey was conducted with students at the Umluj Campus of the University of Tabuk. Data were collected during the 2016–2017 academic years. The sample size was calculated using the G\*Power software, version 3.1 (Informer Technologies, Inc. Dominica). A minimum sample size of 153 was needed to examine the relationship between breastfeeding knowledge, attitudes, exposure, and intention, with a power of 80% and with an  $\alpha$  error of 0.05. Based on the results of previous study, a Pearson correlation coefficient of 0.2

was used as an estimate of this correlation.<sup>[19]</sup> Students were selected using a systematic random sampling technique where every fifth was selected starting with the random selection of the first student. Students who were unmarried, were of Saudi nationality, and were between the ages of 18 and 25 years were included in the study.

### Data collection

Data were collected using a self-reported questionnaire. A hard copy of the survey was handed to participants by a research assistant who approached them in the classroom in the last 10 min of the lecture and asked them to return the completed survey to a box located in the main office in each department.

The questionnaire was adapted from previous studies and comprised four sections.<sup>[19,20]</sup> These sections address sociodemographic information (age, department, and year of study), breastfeeding exposure and future intentions, breastfeeding knowledge scale, and attitude scale. The knowledge and attitude scales had been used and validated in a previous study. The content validity indices of the knowledge and attitude scales were 0.93 and 0.91, respectively. The internal consistency reliability of the attitude scale was 0.70.<sup>[20]</sup>

The breastfeeding exposure scale included three questions about breastfeeding exposures and one question on future breastfeeding intention. Breastfeeding exposures were measured whether the participant had been breastfed (yes/no/unsure), whether they knew anyone who had breastfed (yes/no), and whether they had ever witnessed a woman breastfeeding (yes/no). The three breastfeeding exposure variables were summed to give a total breastfeeding exposure score, with a possible range from 0 to 3. For the question about the participant's breastfeeding status, "unsure" responses were considered the same as "no" and scored accordingly. For univariate analyses, breastfeeding exposures were collapsed into two categories: a score of 0–1 was categorized as low exposure and a score of 2–3 was categorized as high exposure.

Breastfeeding intention was assessed by asking participants, whether they wanted to breastfeed their children. Participants were given two points for "yes" and one point for "no."

Breastfeeding knowledge scale included 14 items that scored on a dichotomous scale (agree/disagree). Participants were given one point for a correct response. The possible score ranged from 0 to 14.

Breastfeeding attitude scale included 15 items that are scored on a 4-point Likert scale (strongly disagree, somewhat disagree, somewhat agree, and strongly

agree). A total attitude score was calculated by summing all items and dividing by the total number of items. To facilitate analysis, negatively worded items on the attitude scale were reverse coded to ensure consistent scoring so that higher attitude scores reflected more positive attitudes.

The breastfeeding knowledge and attitude scales were translated from English into Arabic using the blind-back translation method for ensuring the semantic and technical equivalence.<sup>[21]</sup> The content validity of the Arabic version was assessed by three academic experts in the field of maternal and child health nursing. Some modifications were made to the scale items before use. For example, as the target population was unmarried university students, the statement “breastfeeding interferes with my sex life” was removed. Furthermore, the term “bottle feeding” was changed to “formula feeding” as expressed breast milk can be fed to babies in bottles. Face validity was tested with ten students, showing that scale items were easily understood by all students (100%).

### Ethical considerations

The study was approved by the Ethics Committee of Tabuk University (Approval code: 1438-3-1). Written and informed consent for participation was obtained from each participant. They were also ensured about the confidentiality of their information and the voluntariness of participation in the study.

### Data analysis

Data analysis was performed using SPSS version 25 software (IBM Corp. Armonk, New York, USA). Statistical procedures were completed to a significant level of 5%. Descriptive statistics were used to analyze the responses to all questions and to describe participants. Comparisons of mean knowledge and attitude scores according to sociodemographic variables were performed with analysis of variance test. A covariance analysis was performed to investigate which of the sociodemographic variables can predict students' knowledge, attitudes, and intention. The relationships between breastfeeding knowledge, attitude and exposure, were examined by Pearson bivariate correlations. Phi coefficient was used to examine the association between breastfeeding knowledge, attitude and intention. To estimate the independent contribution of study variables on breastfeeding intention, logistic regression analysis was used. Variables with a significance level of  $P < 0.05$  in the univariate analysis were entered into the model in a forward stepwise manner. All breastfeeding exposures were entered as separate dichotomous variables (yes/no).

## RESULTS

One hundred and twenty-four of 150 students completed the survey, with a response rate of 91.8%. Sixty-nine percent of the students were <22 years old, with a mean age of  $20.6 \pm 1.38$  years. Seventy-two percent of the students reported that they were breastfed in their infancy, 94% knew someone who breastfed, 94% had ever witnessed a woman breastfeeding, and 82% wanted their future child to be breastfed [Table 1].

Breastfeeding knowledge scores ranged from 2.99 to 14, with a mean score of  $9.51 \pm 2.63$ . Most of the participants were aware that breastfeeding is healthier for the baby than formula feeding (58.1%), that breastfeeding helps prevent infection (60.5%) and allergies (73.4%), that breast size has no relation to the ability to breastfeed (54.8%), that there are differences in breast milk and cow's milk and soya milk (75%), and that breastfeeding should be started almost

**Table 1: Characteristics of the participants (n=124)**

Characteristics	n (%)
Age (mean $\pm$ SD)	20.6 $\pm$ 1.387
19-21	86 (69.4)
22-26	32 (25.8)
Missed	6 (4.8)
Department	
Preparatory year	30 (24.2)
Scientific major	50 (40.3)
Humanity major	40 (32.3)
Missed	4 (3.2)
Year of study	
Year 1	30 (24.2)
Year 2	36 (29)
Year 3	29 (23.4)
Year 4	25 (20.2)
Missed	4 (3.2)
Ever been breastfed	
Yes	87 (72.2)
No	7 (5.6)
Unsure	26 (21.0)
Missed	4 (3.2)
Knows someone who has breastfed	
Yes	117 (94.4)
No	2 (1.6)
Missed	5 (4.0)
Ever witnessed a woman breastfeeding	
Yes	117 (94.4)
No	2 (1.6)
Missed	5 (4.0)
Intention to breastfeed	
Yes	102 (82.3)
No	17 (13.7)
Missed	5 (4.0)

SD: Standard deviation

immediately after birth (84.7%). More than half (69.4%) of the participants believed that breastfeeding women should avoid certain foods, and 54.9% believed that breastfeeding is painful [Table 2].

Mean attitude scores were  $42 \pm 1.8$ , with a range from 25.8 to 53.55, indicating overall positive attitudes. Over 80% of the participants respected women who breastfeed and agreed that breastfeeding is more convenient than formula feeding. Breastfeeding was perceived as more enjoyable by babies, helps the mother feel closer to her baby, and helps babies get a better start in life. Most of the participants believed that formula feeding gives more freedom to the mother with the majority (72%) perceived breastfeeding in public as embarrassing, unacceptable, and makes breastfeeding less attractive. Over 75% of the participants believed that women of all education levels and socioeconomic class should breastfeed their children. Almost two-thirds (67.8%) of participants believed that formula feeding and breastfeeding benefit the child equally [Table 3].

Significantly higher knowledge scores were observed among senior students ( $P = 0.004$ ), among those who reported being breastfed as infants ( $P = 0.05$ ), and among those who reported having witnessed a woman breastfeeding ( $P = 0.009$ ) [Table 4]. Mean attitude scores were significantly higher among students reporting witnessing a woman breastfeeding ( $P = 0.001$ ). Intention percentages were significantly higher among students in the age group of 19-21 (82%,  $P = 0.03$ ), and among students who reported having been breastfed as infants (90%,  $P = 0.02$ ) (Data not shown). The results of the covariance analysis indicated that none of the sociodemographic variables can predict students' breastfeeding knowledge, attitudes, or future intention.

A significant positive relationship was found between breastfeeding knowledge and attitude ( $r = 0.896$ ,  $P < 0.01$ ), breastfeeding knowledge and exposure ( $r = 0.191$ ,  $P < 0.01$ ), breastfeeding knowledge and intention to breastfeed (Phi coefficient=0.179,  $P = 0.033$ ), and breastfeeding attitudes and intention to breastfeed (Phi coefficient=0.177,  $P = 0.030$ ). In regression analysis, participants' attitude (OR=1.930,  $P < 0.001$ ) and knowledge (OR=-3.280;  $P < 0.001$ ) were associated with future breastfeeding intention. However, participants' own breastfeeding status, knowing someone who had breastfed, and witnessing breastfeeding were not independently associated with the future intention to breastfeed [Table 5]. Moreover, in regression analysis, none of the students' personal characteristics could predict the future intention to breastfeed.

## DISCUSSION

The current study demonstrates positive breastfeeding intention and attitudes toward breastfeeding and a good level of breastfeeding knowledge among participants. The majority respected women who breastfeed and agreed that breastfeeding is more convenient than formula feeding. Participants believed that women of all educational and socioeconomic classes should breastfeed. Muslim women are required to follow the Qur'an's instructions about breastfeeding and weaning of infants. These religious instructions must be utilized to influence the local breastfeeding initiation rate and duration in the Saudi community.<sup>[17]</sup> Our findings are consistent with earlier studies in Arab and non-Arab countries.<sup>[15,22,23]</sup> Padmanabhan *et al.* found high breastfeeding intention rate among female college students in India; Hamade *et al.* found a similar breastfeeding intention rate and average breastfeeding knowledge among university students in Lebanon and Syria, and Al-Ali *et al.* also

**Table 2: Participants' knowledge about breastfeeding (n=124<sup>a</sup>)**

Knowledge statement	Agree, n (%)	Disagree, n (%)
For a baby, formula feeding is healthier than breastfeeding	47 (37.9)	72 (58.1)
The baby sucking on the mother's breast is painful	68 (54.8)	46 (37.1)
Breastfed babies are smarter than babies who are not breastfed	83 (66.9)	33 (26.6)
There is no difference between breast milk, cow's milk, and soy milk	24 (19.4)	93 (75.0)
Breastfeeding alone provides sufficient nutrition in the first few months of life for the baby	86 (69.4)	26 (21.0)
Nicotine, caffeine, alcohol, and medicine are passed from the mother's body to breast milk	76 (61.3)	35 (28.2)
Most women make enough breast milk to adequately feed the baby	76 (61.3)	38 (30.6)
The breastfeeding woman should avoid eating certain foods	86 (69.4)	26 (21.0)
Babies who are formula fed have more illnesses than babies who are breastfed	75 (60.5)	38 (30.6)
Breastfeeding helps prevent infections in the baby	85 (68.5)	26 (21.0)
Breastfeeding helps protect babies from having allergies	91 (73.4)	22 (17.7)
A woman who has small breasts cannot breastfeed	43 (34.7)	68 (54.8)
Some babies have allergies to cow's milk	88 (71.0)	25 (20.2)
Breastfeeding should be started as soon as possible after the baby is born	105 (84.7)	10 (8.1)

<sup>a</sup>Columns where the numbers do not add up to the specific *n* reflects missing values for this column

**Table 3: Participants' attitudes toward breastfeeding**

Attitude statement	Strongly agree or agree, <i>n</i> (%)	Disagree or strongly disagree, <i>n</i> (%)	Mean $\pm$ SD
Formula feeding gives more freedom to the mother	94 (75.8)	14 (11.3)	1.76 $\pm$ 0.78
Breastfeeding makes breasts less attractive	84 (67.8)	24 (19.4)	1.98 $\pm$ 0.77
Breastfeeding would make my partner or me more attractive	56 (45.2)	50 (40.3)	2.73 $\pm$ 0.88
Babies enjoy breastfeeding more than formula feeding	93 (75.0)	14 (11.3)	3.36 $\pm$ 0.70
Breastfeeding will help a mother feel closer to her baby	92 (74.2)	13 (10.5)	3.52 $\pm$ 0.74
Formula feeding is more sanitary than breastfeeding	43 (34.6)	66 (53.2)	2.53 $\pm$ 0.93
Breastfeeding in public is embarrassing	90 (72.6)	17 (13.7)	1.72 $\pm$ 0.75
Formula feeding and breastfeeding benefit the child equally	84 (67.8)	24 (19.4)	1.96 $\pm$ 0.69
The decision to breastfeeding should be made by both parents	68 (54.8)	39 (31.4)	2.80 $\pm$ 0.81
Breastfeeding is acceptable in public	36 (29.0)	74 (59.7)	2.60 $\pm$ 0.81
Babies who are breastfed get a better start in life	96 (77.4)	10 (8.1)	3.39 $\pm$ 0.67
Women of all educational levels should breastfeed their children	98 (79.1)	9 (7.3)	3.45 $\pm$ 0.63
Women of all socioeconomic classes should breastfeed their children	90 (76.7)	10 (8.1)	3.43 $\pm$ 0.66
Breastfeeding is more convenient than formula feeding	100 (80.6)	7 (5.6)	3.52 $\pm$ 0.62
I respect women who breastfeed	106 (85.5)	3 (2.4)	3.57 $\pm$ 0.54
Total mean attitude score			2.82 $\pm$ 0.73

SD: Standard deviation

**Table 4: Comparison of the mean knowledge and attitude scores according to sociodemographics and exposure**

Variables	Knowledge		Attitudes	
	Mean $\pm$ SD	<i>P</i>	Mean $\pm$ SD	<i>P</i>
Age				
19-21	08.80 $\pm$ 2.6	0.88	20.10 $\pm$ 0.13	0.271
22-26	10.50 $\pm$ 1.5		21.37 $\pm$ 0.11	
Department				
Preparatory	7.77 $\pm$ 2.19	0.071	20.25 $\pm$ 0.10	0.640
Scientific majors	9.60 $\pm$ 1.87		19.95 $\pm$ 0.45	
Humanity majors	9.10 $\pm$ 1.2		20.10 $\pm$ 0.11	
Year				
Year 1	7.77 $\pm$ 2.19	0.004	20.25 $\pm$ 0.10	0.001
Year 2	9.00 $\pm$ 2.81		20.40 $\pm$ 0.12	
Year 3	9.52 $\pm$ 2.94		19.80 $\pm$ 0.12	
Year 4	10.21 $\pm$ 1.74		20.25 $\pm$ 0.12	
Ever been breastfed				
Yes	9.40 $\pm$ 2.66	0.050	19.95 $\pm$ 0.11	0.091
No	8.17 $\pm$ 1.47		20.10 $\pm$ 0.11	
Knows someone who has breastfed				
Yes	9.10 $\pm$ 2.59	0.83	20.10 $\pm$ 0.12	0.61
No	9.50 $\pm$ 2.12		20.80 $\pm$ 0.05	
Ever witnessed a woman breastfeeding				
Yes	9.37 $\pm$ 2.43	0.009	19.95 $\pm$ 0.10	0.00
No	7.63 $\pm$ 2.52		21.75 $\pm$ 0.11	

SD: Standard deviation

**Table 5: Results of regression analysis to predict the predictive factors of breastfeeding intention**

Variable	Standard error	Odds Ratio	95% CI	P
Breastfeeding attitudes	0.074	1.930	[1.876,4.235]	< 0.001
Own breastfeeding status	0.135	0.758	[0.034,0.833]	0.060
Know someone who has breastfed	0.154	0.501	[0.500,0.950]	0.695
Witnessed a woman breastfeeding	0.174	0.703	[0.524,0.850]	0.695
Breastfeeding knowledge	1.081	3.280	[2.265, 5.012]	< 0.001

CI: Confidence interval

found a similar level of knowledge among students in Jordan. Conversely, a number of studies in Egypt and Saudi Arabia found low levels of breastfeeding knowledge among university students.<sup>[17,24]</sup>

Students in the present study were knowledgeable regarding the benefits of breastfeeding for baby and mother and the importance of the early initiation of breastfeeding. These findings are consistent with studies carried out in the Middle East among university students.<sup>[15,22]</sup> Hamade *et al.* found average breastfeeding knowledge among university female students in Lebanon and Syria.<sup>[15]</sup>

Knowledge gaps and misconceptions about breastfeeding were identified among participants. These misconceptions could be addressed through age-appropriate school health education sessions that are culturally sensitive and teen-friendly. Such educations may positively influence the students' knowledge, attitude, and future intention of breastfeeding.<sup>[16,17,25,26]</sup>

Although participants had generally positive attitudes toward breastfeeding, a significant proportion of students believed that formula feeding gives more freedom to the mother, that breastfeeding in public is unacceptable and embarrassing, and that formula feeding and breastfeeding benefit the child equally. These results are consistent with other studies in the Middle Eastern countries that found embarrassment as a barrier to breastfeeding.<sup>[15,17]</sup>

The current findings support previous studies that knowledge level and attitudes about breastfeeding are interrelated; the greater the students' breastfeeding knowledge, the more positive their attitude toward breastfeeding.<sup>[15,17,24]</sup> Hamade *et al.* surveyed female undergraduate students in Lebanon and Syria and found a positive correlation between knowledge and attitudes, and similarly, students believed that the formula feeding was more convenient and equally beneficial for the infant.

Consistent with previous studies, the findings showed a significant positive relationship between intention to breastfeed and breastfeeding knowledge and attitudes. Participants who intended to breastfeed had significantly higher breastfeeding knowledge and positive attitudes. Moreover, a positive breastfeeding attitude and a

greater probability of breastfeeding intention were observed among participants in the present study who were breastfed as babies. The current findings are consistent with other previous studies that demonstrated exposure to breastfeeding was associated with positive breastfeeding attitudes and intentions.<sup>[15,20]</sup>

The logistic regression analysis identified participants' attitude and knowledge as factors independently and positively associated with future breastfeeding intention. Although the  $R^2$  values were low, they drew an important conclusion about how changes in the knowledge and attitude scores are associated with changes in future breastfeeding intention. Participants' characteristics, participants' own breastfeeding status, knowing someone who had breastfed, and witnessing breastfeeding were not independently associated with the future intention to breastfeed in this sample of female students. These findings could be explained that watching a woman breastfeed or knowing someone who breastfed as a child is a common thing in Saudi culture where breastfeeding initiation rate is very high. The dilemma is the duration of breastfeeding as well as the commitment to exclusively breastfeeding.<sup>[6]</sup> Therefore, breastfeeding campaigns and interventions directed to the young Saudi population should promote exclusive breastfeeding and improve public acceptance of breastfeeding. Endorsement of breastfeeding with emphasis on benefits such as the convenience of feeding on demand without the need to prepare bottles or purchase formula may help promote breastfeeding as the most economical as well as beneficial feeding method.<sup>[25]</sup>

The findings support other studies that describe beliefs about breastfeeding being formed early in life, often before having children.<sup>[12,27]</sup> Addressing the young Saudi population might help instill positive breastfeeding practices in the community<sup>[28]</sup> through introducing educational material in schools aiming to promote breastfeeding and correcting misconceptions.

Education is needed for the general public concerning misconceptions that address Saudi men and other important people who support the breastfeeding mother. More positive attitudes regarding breastfeeding among men and nonbreastfeeding women may provide

breastfeeding mothers with the help and support needed to continue breastfeeding for the recommended 6 months.

This study has several limitations. The use of a descriptive cross-sectional design prohibits predictions regarding actual breastfeeding behavior. This nonexperimental design limits the ability to infer a causal relationship between attitudes and breastfeeding intentions. Furthermore, there is a risk that social desirability influenced the responses to the self-report questionnaires. The findings of this study are limited to one university and female students who have Saudi nationality and cannot be generalized to other populations. Future research could include university male students and those without a university degree to get a better understanding of their attitudes, subjective norms, intentions, and behaviors regarding infant feeding methods that can be generalized to a broader population. This will allow investigation of the impact of education on infant feeding beliefs, intentions, and breastfeeding behavior.

## CONCLUSION

Female university students in one Saudi Arabian university have good knowledge and positive attitudes toward breastfeeding. However, there were misconceptions about breastfeeding that should be addressed through appropriate education and promotion programs. These gaps should be stressed during future breastfeeding promotion programs. Implementing educational programs in schools, high schools, and universities about breastfeeding, as well as implementing mass media education and advertising programs, can improve the knowledge, attitude, and intention of breastfeeding in the future mothers.

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## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- World Health Organization. Long-Term Effects of Breastfeeding: A Systematic Review. Geneva: World Health Organization; 2013. Available from: [https://www.who.int/maternal\\_child\\_adolescent/documents/breastfeeding\\_long\\_term\\_effects/en/](https://www.who.int/maternal_child_adolescent/documents/breastfeeding_long_term_effects/en/). [Last accessed on 2018 Aug 15].
- World Health Organization. Short-Term Effects of Breastfeeding. A Systematic Review on the Benefits of Breastfeeding on Diarrhoea and Pneumonia Mortality. Geneva: World Health Organization; 2013. Available from: <http://www.who.int/iris/handle/10665/95585>. [Last accessed on 2018 Aug 19].
- World Health Organization. United Nations International Children's Emergency Fund. The Ten Steps for Successful Breastfeeding; 2012. Available from: <http://www.babyfriendlyusa.org/aboutus/baby-friendly-hospital-initiative/the-ten-steps>. [Last accessed on 2018 Aug 17].
- Kramer MS, Kakuma R. Optimal duration of exclusive breastfeeding. *Cochrane Database Syst Rev* 2012;15:CD003517.
- Imdad A, Yakoob MY, Bhutta ZA. Effect of breastfeeding promotion interventions on breastfeeding rates, with special focus on developing countries. *BMC Public Health* 2011;11 Suppl 3:S24.
- Alzaheb RA. Factors influencing exclusive breastfeeding in Tabuk, Saudi Arabia. *Clin Med Insights Pediatr* 2017;11:1179556517698136.
- World Health Organization. Global Targets 2025. To Improve Maternal, Infant and Young Child Nutrition; 2014. Available from: <http://www.who.int/nutrition/global-target-2025/en/>. [Last accessed on 2018 Aug 15].
- Al Juaid DA, Binns CW, Giglia RC. Breastfeeding in Saudi Arabia: A review. *Int Breastfeed J* 2014;9:1.
- Amin T, Hablas H, Al Qader AA. Determinants of initiation and exclusivity of breastfeeding in al Hassa, Saudi Arabia. *Breastfeed Med* 2011;6:59-68.
- Mohamed MJ, Ochola S, Owino VO. Comparison of knowledge, attitudes and practices on exclusive breastfeeding between primiparous and multiparous mothers attending Wajir district hospital, Wajir county, Kenya: A cross-sectional analytical study. *Int Breastfeed J* 2018;13:11.
- Mogre V, Dery M, Gaa PK. Knowledge, attitudes and determinants of exclusive breastfeeding practice among Ghanaian rural lactating mothers. *Int Breastfeed J* 2016;11:12.
- Saunders-Goldson S, Edwards QT. Factors associated with breastfeeding intentions of African-American women at military health care facilities. *Mil Med* 2004;169:111-6.
- Čatipović M, Voskresensky Baričić T, Rokvić S, Grgurić J. Adolescents' knowledge of breastfeeding and their intention to breastfeed in the future. *Children (Basel)* 2017;4:51.
- Zahid I, Sheikh R, Ahmed A, Ladiwala ZF, Lashkerwala SS, Memon AS. Knowledge and beliefs regarding breastfeeding in college students of Karachi. *Aust Med J* 2016;9:386-95.
- Hamade H, Naja F, Keyrouz S, Hwalla N, Karam J, Al-Rustom L, *et al*. Breastfeeding knowledge, attitude, perceived behavior, and intention among female undergraduate university students in the Middle East: The case of Lebanon and Syria. *Food Nutr Bull* 2014;35:179-90.
- Al-Domi HA. Knowledge and attitudes towards breastfeeding among unmarried female graduates at the University of Jordan. *Mal J Nutr* 2015;21:309-19.
- Amin TT, Abdulrahman AG, Al Muhaidib NS, Al Hamdan OA. Breastfeeding attitudes and knowledge among future female physicians and teachers in Saudi Arabia. *Health Sci J* 2014;8:102-15.
- Ho YJ, Yu CC. Attitudes of high school and vocational school students toward breastfeeding in Taiwan. *J Perinat Educ* 2014;23:89-95.
- Kavanagh KF, Lou Z, Nicklas JC, Habibi MF, Murphy LT. Breastfeeding knowledge, attitudes, prior exposure, and intent among undergraduate students. *J Hum Lact* 2012;28:556-64.
- Tarrant M, Dodgson JE. Knowledge, attitudes, exposure, and future intentions of Hong Kong university students toward infant feeding. *J Obstet Gynecol Neonatal Nurs*

- 2007;36:243-54.
21. Beck CT, Bernal H, Froman RD. Methods to document semantic equivalence of a translated scale. *Res Nurs Health* 2003;26:64-73.
  22. Al-Ali NM, Hatamleh R, Khader Y. Intention and attitudes towards breastfeeding among undergraduate female student at a public Jordanian university. *Evid Based Mid* 2012;10:119-24.
  23. Padmanabhan R, Thulasingam M, Chinnakalai P. Female college students knowledge, attitude and future intention towards breastfeeding: Implications for advocacy. *J Clin Diagn Res* 2016;10:LC11-4.
  24. Ahmed A, el-Guindy SR. Breastfeeding knowledge and attitudes among Egyptian baccalaureate students. *Int Nurs Rev* 2011;58:372-8.
  25. Jefferson UT. Infant feeding attitudes and breastfeeding intentions of black college students. *West J Nurs Res* 2014;36:1338-56.
  26. Reena I, Ruiz CS, Shows AR, Wallet KA. Breastfeeding promotion in an ethnically diverse adolescent sample. *Int J Nurs* 2014;1:1-10.
  27. Giles M, Connor S, McClenahan C, Mallet J. Attitudes to breastfeeding among adolescents. *J Hum Nutr Diet* 2010;23:285-93.
  28. Ramji S. Breastfeeding – A 3D experience. *Indian J Med Res* 2011;134:141-2.towards breastfeeding among undergraduate female student at a public Jordanian university. *Evid Based Mid* 2012;10:119-24.