

Breastfeeding practice and knowledge among women attending primary health-care centers in Riyadh 2016

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ABSTRACT

Introduction: Breast milk is the best natural essential nutrition to newborns and infants. However, the practice of breastfeeding (BF) has declined in Saudi Arabia. **Objective:** The objective of this study was to assess the knowledge and practice of BF with their determinants among mothers in Riyadh. **Materials and Methods:** In this cross-sectional study, 252 mothers attending the well-baby clinics in Riyadh from March 2016 to May 2017 were selected randomly with their consent and studied by a standardized questionnaire. **Results:** Of the 252 women, 69.4% were 25–35 years of age and 56.7% with a bachelor degree or higher education. Nearly 75% mothers had education on BF before our study. Mixed feeding was the most preferred method (51.6%) followed by artificial milk (29.4%). The most reported reason for discontinuing BF was breast milk insufficiency (37.3%) and of breastfeed continuation was their perceived benefit (36.6%). Excellent knowledge was observed among 12.7%, good knowledge in 57.1%, and unsatisfactory level in 30.2% mothers. The regression model shows that high school education improved the knowledge by 10.9 points ($P = 0.024$) and undergraduate by 18.7 points (P value = 0.001) when compared to women who were literate. Women with parity >5 improved knowledge score by 17.3 points ($P < 0.001$). **Conclusion:** We observed that majority (57.1%) of Saudi mothers had a moderate level of knowledge on BF benefits and 19% had practiced exclusive BF. There is a need for better educational programs to increase awareness on its benefits for the health situation in the country on the long term.

Keywords: Breastfeeding, cross-sectional study, knowledge, practice

Introduction

Breastfeeding (BF) is the natural way for infants' nutrition, it provides the ideal nutrients they need for healthy development and growth.^[1,2] Both the baby and the mother benefit from BF on the short- and long-terms as noted by several studies.^[2,6,7] In newborns, it promotes the development of cognitive skills,^[2,9] immune system,^[1,8] and growth.^[5,9] Also, it reduces the risk of sudden infant death syndrome (SIDS),^[4,2,9,10] type 1 diabetes,^[2,9,11] and many other diseases.^[1,9,11] Additionally, it reduces the mother's risk of developing breast cancer.^[3,4] The accumulated evidence over the last three decades on BF benefits is overwhelming.^[9] Based on this evidence, the World

Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommended BF to be initiated within the first hour of birth, exclusively in the first 6 months, and to be continued for 2 years and beyond with other adequate sources of nutrition.^[12] However, the practice of BF, especially exclusive BF in the first 6 months, remains very low in most countries.^[9,13] Investigating women's knowledge and the association with actual practice is not new.^[14,15] It has been shown that higher knowledge in both mothers and fathers about BF is associated with the better practice.^[14,15] Several studies tried to assess the knowledge of BF benefits, misconceptions, practices, and other aspects and the trends of BF practices locally, regionally, and globally.

The present study aimed to assess the level of knowledge about BF with its determinants among a sample of women attending primary health-care centers (PHCs) in Riyadh. A predictive model

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was formulated with the influence of sociodemographic factors on the knowledge and practice.

Materials and Methods

This study was carried out in seven PHCs under the jurisdiction of the Ministry of health (MOH), Riyadh city, KSA. Ethical approval was granted by the Institutional Review Board. And, it included Saudi and non-Saudi women nursing last child between the age group of 4 and 12 months.

Inclusion criteria

- Mothers who were attending one of the designated PHCs
- Mothers who can read and self-administer the questionnaire.

Exclusion criteria

Mothers who refused to participate.

Study design and sampling method

This cross-sectional study^[16] was conducted at seven PHCs. Two-stage random sampling was adopted. In the first stage, seven PHCs were selected randomly by lottery method from 98 PHCs of seven regions in Riyadh. In the second stage, 55 mothers were randomly selected using a set of random numbers from each PHC. The participants were approached in the well-baby clinic by the trained, Arabic-speaking, nurse in-charge of the health center and explained the purpose of the study to the mothers. The structured questionnaires were provided to them with a written informed consent.

Sample size

A pilot study was conducted at one of the PHCs among thirty women and we observed a 45% prevalence with inadequate knowledge on BF. Hence, the required sample size was estimated using the following formula:

The equation for the sample size calculation^[17] was as follows:

$$\text{Sample Size} = \frac{Z^2 pq}{\delta^2} = 208$$

The minimum required sample size with 5% level of significance and 15% precision was 250.

The research tool

We adopted a standardized self-administered questionnaire developed by Ayed with minimal change for the same purpose and setting of our study with the permission from the author.^[18] The questionnaire is divided into three parts: the first part consisted of demographic data: mother's age, last child age, the number of children, nationality, employment status, education of mother, type of delivery, and receiving health education about BF. The second part consisted of the questions regarding the type of BF for the last child, reasons of continuity, and barriers for BF. The final part consisted of 38 items covering the following scopes

of knowledge on BF: general knowledge, colostrum, advantages to mothers and babies, effective feeding method, duration of feeding, complementary feeding, and problems with BF.

Scoring system for level of knowledge

In this study, we introduced weightage by giving scores to the correct responses for the questions.

1. For 38 questions, correct answer was given a score of "1" and the incorrect answer "0"
2. The total scores were converted as percentages for each participant. (A score out of 100 was calculated by dividing the actual score over the maximum score)
3. Total score <50% was considered "unsatisfactory knowledge"
4. Total score between 50% to <75% was considered "good knowledge"
5. Total score ≥75% was considered "excellent knowledge."

The data were collected and the identity of the participants remained anonymous.

Statistical analysis

The data were analyzed using SPSS 21 (Released 2012. IBM SPSS Statistics for Windows, Version 21.0. IBM Corp., Armonk, NY),^[19] the results were presented as descriptive statistics for sociodemographic data, and the scores obtained by the participants were assessed for the level of knowledge and practice on BF using inferential statistics. Comparisons between the participants on the knowledge score were conducted using independent two sample *t*-test and ANOVA.^[17] The relationship between the score and practice was investigated using ANOVA when considering the sociodemographic data. The association between categorized score and the sociodemographic data were tested using Chi-Square nursing children (Fisher's exact test was used when the cells contained <5). Multiple linear regressions^[17] were applied to study the effect of the variables on the level of knowledge score without loss of power due to the categorizing employed in the descriptive part. Regarding the choice of the best linear model, we considered using Akaiik Information Criterion (AIC) and Bayesian Information Criterion (BIC). The model that produced the lowest Information Criterion (IC) score (AIC and BIC) will be considered the best fitting model.

Results

The study selected 400 mothers and 252 had participated with a response rate of 63%. Table 1 presents the baseline characteristics of the study population. The mean age was 29.1 years, ranging from 17 to 43 years, with a majority of 69.4% between 26–35 years. Almost 60% of nursing children were >6 months. The level of education was college, university (56.7%), or secondary school (27.4%). We observed that 71% of women were unemployed and only 6% of them had more than five children. Nearly 74.6% were educated on BF benefits, 38.1% by physicians. About 51.6% mothers practiced mixed feeding, 29.4% artificial milk, and only 19% reported exclusive BF. The correct responses contributed to

Table 1: Descriptive statistics for baseline characteristics

Characteristics	n (%)
Mother's age (years)	
≤25	43 (17.1)
26-35	175 (69.4)
>35	34 (13.5)
Nationality	
Saudi	190 (75.4)
Non-Saudi	62 (24.6)
Level of education	
Read and write (no formal education)	18 (7.1)
Elementary school	11 (4.4)
Intermediate school	11 (4.4)
Secondary school	69 (27.4)
College or university	143 (56.7)
Employment status	
Employed	73 (29.0)
Unemployed	179 (71.0)
Number of children	
1-5	237 (94.0)
>5	15 (6.0)
Age of the last child	
≤6 months	102 (40.5)
>6 months	150 (59.5)
Mode of delivery of last child	
Natural (VD)	184 (73.0)
Cesarean	68 (27.0)
Received health education on BF benefits	
Yes	188 (74.6)
No	64 (25.4)
Received health education from	
Physicians	96 (38.1)
Nurses	50 (19.8)
Other	42 (16.7)
Type of breastfeed for last child	
Exclusive	48 (19.0)
Mixed	130 (51.6)
Artificial	74 (29.4)

VD: Vaginal delivery; BF: Breastfeeding

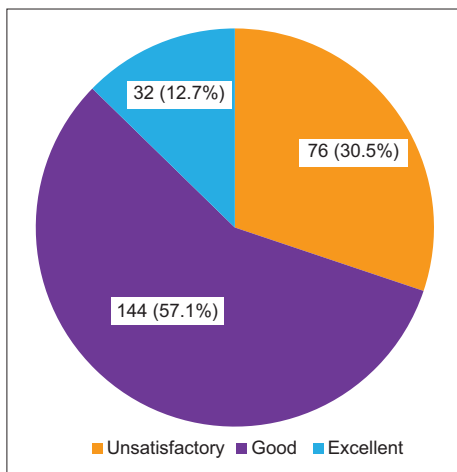


Figure 1: Level of knowledge on breastfeeding among mothers

the level of knowledge on BF are presented in Table 2 and graph in Figure 1. We observed that 37.3% mothers reported insufficient

Table 2: Knowledge regarding breastfeeding among mothers

Statements	Correct response, n (%)
Benefits to babies	
BF reduces the risk of infection among babies	174 (69)
BF increases the baby's intelligence	204 (81)
BF helps to reduce the incidence of child abuse and neglect	153 (60.7)
Baby who received BF is less prone to get diarrhea	163 (67.1)
Breast milk provides baby with more protection from allergy compared to formula milk	147 (58.7)
BF causes good development of baby's teeth and gum	200 (81)
Benefits to mothers	
Exclusive BF is beneficial in spacing birth	169 (67.1)
BF helps to stimulate uterine contraction	198 (78.6)
Mothers who practiced BF may achieve prepregnancy weight faster	182 (72.2)
Frequent BF may prevent breast engorgement	205 (81.3)
Mother who practiced BF has a low risk of getting breast cancer	173 (68.7)
BF may protect against osteoporosis	104 (41.3)
Colostrum	
Colostrum is the mother's early milk, which is thick, sticky, and yellowish	204 (81)
Colostrum is difficult to digest and needs to be discarded	136 (54)
Colostrum causes constipation among babies	128 (50.8)
Colostrum cannot protect babies from jaundice	95 (37.7)
Effective feeding	
Babies will gain weight if they receive effective feeding	163 (64.7)
Correct positioning helps to achieve effective BF	214 (84.9)
Babies sleep well after they receive adequate BF	208 (82.5)
Duration of feeding	
BF should be initiated within 30 min after delivery	147 (58.3)
BF should be given on demand	124 (49.2)
Baby should be allowed to breastfeed for at least 10-20 min for each feeding	173 (68.7)
BF should be continued up to 2 years even though the baby has received complementary food	178 (70.6)
Complementary feeding	
Complementary feeding should be introduced at 6 months of age	210 (83.3)
Mothers may mix BF and formula feeding once baby starts taking complementary food	27 (10.7)
Problems	
Breast milk production is influenced by breast size	89 (35.3)
Mothers with inverted nipples cannot breastfeed their babies	37 (14.7)
BF must be discontinued if mother has cracked nipple	60 (23.8)
BF must be discontinued if baby has jaundice	85 (33.7)
BF must be discontinued if mother has breast engorgement	81 (32.1)
Breast engorgement may be reduced with cold packs	84 (33.3)
Practical aspects	
Exclusive BF must be practiced until the infant is 6 months old	140 (55.6)

Contd...

Table 2: Contd...

Statements	Correct response, n (%)
Massage may reduce breast engorgement	171 (67.9)
Breast engorgement may be reduced with cabbage leaf packs	70 (27.8)
Babies who get enough feeding will pass urine more frequently	151 (59.9)
Belching after feeding shows that the baby is full	157 (62.3)
Giving water to baby is encouraged after every BF	76 (30.2)
Oral thrush frequently happens to babies who breastfeed	72 (28.6)

BF: Breastfeeding

breast milk followed by 15.8% mothers reported “return to work,” 38 (13.0) reported baby’s rejections to breast milk as the prime reason, and 6 (2.1) reported that pregnancy again was the least reason for artificial feed. The majority (36.6%) of women chose the benefits of BF followed by religious beliefs (22.3%), for example, the Quran recommendation for BF continuation. Nearly 84.9% reported that correct position helps to achieve effective BF, 83.3% said complementary feeding should be introduced at 6 months of age, and 82.5% observed that babies sleep well after adequate BF. Almost 10.7% mothers said that they may provide breast milk and formula milk while on complementary food and 14.7% mothers felt that they cannot breastfeed their babies due to their cracked nipples.

The mother’s higher level of education, women with children more than 5 and who reported mixed BF practice for their last child when associated with their level of knowledge about BF showed statistical significance and the Chi-Square is shown in Table 3.

The overall mean score (55.9) was tested using one-sample test against 50% (the passing mark) for knowledge. The test showed significant difference between the participants’ mean score and the proposed passing mark with 95% CI: 53.1% to 58.4%.

The independent two sample *t*-test shows that there are three variables with statistically significant differences. Employed women have higher mean scores than that of unemployed women by ~7 points. Second, women with more than 5 children scored on an average of 20 points higher than women with 1–5 children. Finally, women who received health education about BF have on an average of higher score by ~9 points.

The ANOVA revealed that mothers older than 35 years showed higher average score than mothers younger than 25 years and mothers between the ages of 25 and 35. In addition, women with college or university degrees have higher average score than women who can only read and write. Finally, women who reported “other” health education providers have statistically higher average score than women with no BF education (health education provider).

The combinations of all the variables were tested by modeling the data against the score using regression analysis. The model

shows [Table 4] that woman with college or university degree can have an improved score by an average of 18.7 points and women with secondary school degree can have an improved knowledge score by 10.9 points in comparison to women who can only read and write. Women with more than 5 children have higher knowledge score than women with 1 or 5 children by 17.3 points. No health education about BF can reduce the average knowledge score by 6.5 points.

Discussion

The World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF) recommend BF to be exclusive in the first 6 months of age and to be continued with adding complementary feeds until the child reaches 2 years.^[14] The medical evidence about the benefits of BF is overwhelming. However, the practice of BF, especially exclusive BF, has declined over the years in Saudi Arabia.^[20] In Riyadh, in a study done in PHCs on 1000 participants with a child aged 6 months or below, the rate of exclusive BF was 62.9% at birth, 13.2% at 4 months, and only 3.3% at the age of 6 months.^[21] Another study conducted in Abha city with a sample size of 600 mothers observed an exclusive BF of 7.3% in the first 6 months.^[18] Higher rates were reported in Makkah with sample size of 65 participants practicing exclusive BF in the first 6 months to be 18.5%.^[22] In AlHassa region, the rate was 24.4% in the first 6 months.^[23] In our study, the rate of exclusive BF among infants at age of 4–12 months was 19%. The reason for the low rate in the previous study done in Riyadh was the PHC staff who had failed to give proper education to mothers, and a high number of pamphlets containing a list of their products and promotion messages of bottle-feeding were distributed by manufacturing companies on formula milk.^[21]

Mixed feeding was the preferred feeding system in our study with a rate of 51.6% as well in many studies.^[20,24-26] Perceived breast milk insufficiency was considered as the main reason for BF discontinuation in our study (37.3%). Several studies have reported that it can be due to the lack of knowledge about the frequencies of BF, timing of initiating BF, lack of counseling and support, incorrect practices, and medical and health-related issues.^[27-30] The other reason for discontinuation of BF was maternal work (15.8%). Multiple studies showed that maternal occupation acts as a barrier to BF.^[18,24,31-33] It was mentioned that the reasons behind that were embarrassment to breastfeed in public, lack of lactation room in workplace, and lack of facilities of child care and short maternal leave (2 months).^[18,24,31-33]

The majority of the mothers recognized the benefits of BF as the main cause to continuing BF. This is also supported by religious beliefs as reported by many mothers who considered the Quran recommendation in the subject. This seems to be correlated with other studies in the literature.^[18,21,22,24] Such issue should be further enhanced among women so that the BF practice can increase in the future. The regression analysis showed that the mother’s level of education was a very important factor to increase knowledge (14%) for college or university education and (11.6%)

Table 3: Inferential statistics Chi-square test for level of knowledge on breastfeeding

Variable	Unsatisfactory (%) 76 (30.2)	Good (%) 144 (57.1)	Excellent (%) 32 (12.7)	Total (%) (n=252)	P*
Mother's age					
≤25	16 (37.2)	22 (51.2)	5 (11.6)	43 (17)	0.110
26-35	55 (31.4)	101 (57.7)	19 (10.9)	175 (69.4)	
>35	5 (14.7)	21 (61.8)	8 (23.5)	34 (13.4)	
Age of the last child					
≤6 months	34 (33.3)	54 (52.9)	14 (13.7)	102 (40.4)	0.537
>6 months	42 (28.0)	90 (60.0)	18 (12.0)	150 (59.5)	
Nationality					
Saudi	55 (28.9)	109 (57.4)	26 (13.7)	190 (75.3)	0.615
Non-Saudi	21 (33.9)	53 (56.6)	6 (9.7)	62 (24.6)	
Level of education					
Read and write	10 (55.6)	7 (38.9)	1 (5.6)	18 (7.1)	0.020 [†]
Elementary school	5 (45.5)	5 (45.5)	1 (9.1)	11 (4.3)	
Intermediate school	5 (45.5)	4 (36.4)	2 (18.2)	11 (4.3)	
Secondary school	27 (39.1)	34 (49.3)	8 (11.6)	69 (27.3)	
College or university	29 (20.3)	94 (65.7)	20 (14.0)	143 (56.7)	
Employment status					
Employed	14 (19.2)	48 (65.8)	11 (15.1)	73 (28.9)	0.052
Unemployed	62 (34.6)	96 (53.6)	21 (11.7)	179 (71)	
Number of children					
1-5	76 (32.1)	132 (55.7)	29 (12.2)	237 (94)	0.030 [†]
>5	0	12 (80.0)	3 (20.0)	15 (5.9)	
Last delivery mode					
Natural	56 (30.4)	105 (57.1)	23 (12.5)	184 (73)	0.981
Cesarean	20 (29.4)	39 (57.4)	9 (13.2)	68 (26.9)	
Health education about BF benefits					
Yes	51 (27.0)	113 (59.8)	25 (13.2)	189 (75)	0.164
No	25 (39.7)	31 (49.2)	7 (11.1)	63 (25)	
Health education provider					
Not applicable (no BF education)	25 (39.1)	32 (50.0)	7 (10.9)	64 (25.3)	0.206
Physicians	27 (28.1)	54 (56.3)	15 (15.6)	96 (38)	
Nurse	17 (34.0)	27 (54.0)	6 (12.0)	50 (19.8)	
Other	7 (16.7)	31 (73.8)	4 (9.5)	42 (16.6)	
Last child type of BF					
Natural	15 (31.3)	29 (60.4)	4 (8.3)	48 (19)	0.026 [†]
Mixed	35 (26.9)	70 (53.8)	25 (19.2)	130 (51.5)	
Artificial	26 (35.1)	45 (60.8)	3 (4.1)	74 (29.3)	

*P < 0.05 statistically significant at 5% level. [†]Fisher's exact test. BF: Breastfeeding

Table 4: Best model for the relationship between the level of knowledge on breastfeeding and its determinants

Variable	β	SD	P [†]	95 CI of the coefficient (β)	
				Lower bound	Upper bound
Constant	42.4	4.4	<0.001	33.7	55.2
Secondary school versus reading and writing	10.9	4.8	0.024	1.4	20.4
College or university versus reading and writing	18.7	4.6	<0.001	9.7	27.9
>2 children versus 1 or 2 children	17.3	4.9	<0.001	7.7	26.9
No health education for BF	-6.5	2.7	0.016	-11.7	-1.2

[†]P-value is considered statistically significant when it is <0.05, R²=16.4%, AIC=2181 and BIC=2206. AIC: Akai Information Criterion; BIC: Bayesian Information Criterion; BF: Breastfeeding; SD: Standard deviation; CI: Confidence interval

for secondary education. Our result was close to a study done in Alhassa city.^[33] Other studies stated that mothers with high education level have excellent knowledge about BF compared to low-educated mothers.^[27,33-35] The higher educational levels can be associated with more exposure to sources of knowledge and more modern approach to maternal and medical education.^[36-38] In addition, employed mothers have good knowledge compared

to unemployed mothers as they have higher chance to contact and meet experienced persons.^[27,34]

The increased number of pregnancies also increased the overall knowledge significantly. In our study, mothers with five children or more have high knowledge and good attitude toward BF practice, a finding similar to study by Maheswari.^[34] This could

be due to more exposure to maternity clinic visits and the higher personal experience as a mother.^[36,39]

The statistically significant factor was the lack of health education about BF. This factor negatively affected the overall score as observed in many studies. The lack of BF education and counseling was associated with low knowledge level and low rate of BF practice.^[21,32,33,39,40] We compared our results in the knowledge of mothers about BF with several local, regional, and global studies. In this study, the level of knowledge was divided into three categories; excellent level of knowledge 12.7%, good 57.1%, and unsatisfactory 30.2%, compared to two studies with the same categorical scoring technique. One was Ayed's study in Abha reported results with excellent level of knowledge 30.7%, good 55.3%, and unsatisfactory 14%.^[18] The other one was done by El-Khedr in Makkah with excellent level as 20%, good level as 27.5%, fair as 35%, and poor level as 17.5%.^[26] Both were nearly similar to our finding as most of the mothers have moderate level of knowledge. Other studies had no clear method in calculating the score for the knowledge, so we used the overall mean score (55.9%) in our study for comparison. Most studies concluded a moderate overall knowledge which is similar to our result,^[25,35,41] for example in Eldeek *et al.*'s.^[41] study, the overall knowledge was 52.6%.

The highest score in the level of knowledge was found in a study conducted in the US (75.9%).^[38] The reasons were related to effort of awareness intervention to promote BF and social and public support.^[38,39,42] One study had a different trend from the studies we reviewed which was conducted in Kuwait (2010) with 1106 participants reported the level of misconceptions to be high (66%) among the surveyed women, which is equal to unsatisfactory level of knowledge.^[43]

Limitations of the study

1. The sample included PHC attendee's mothers; it did not involve mothers in other health-care facilities (private sector), who may have different attitude toward BF and different socioeconomic status, which might imply different patterns of BF
2. The adequate sample size had limited to cover equal proportion of mothers on patterns of BF and its awareness from the general population.

Conclusion

The level of knowledge about BF among the sampled women was moderate. Mixed feeding method was more preferred. The practice of natural BF was lower than other studies in the Kingdom, and the main reason for BF discontinuation was the perceived feeling of breast milk insufficiency.

Recommendations

- To conduct campaigns aiming at raising the knowledge of women about BF benefits and correcting the misconceptions about BF

- To use the social media and public figures to advertise for BF
- To encourage the adoption of strategies to support and promote BF as baby-friendly hospital initiative.

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Conflicts of interest

There are no conflicts of interest.

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