

# Exclusive breastfeeding among Saudi mothers: Exposing the substantial gap between knowledge and practice

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## ABSTRACT

**Background:** Rates of exclusive breastfeeding are exceedingly low in the Arabic world. This study aims to estimate the local prevalence of, and knowledge about, exclusive breastfeeding in Saudi Arabia. **Method:** This is a cross-sectional survey of mothers of infants aged 6–12 months who attended Taif-based “well-baby clinic.” A structured questionnaire was developed to explore predictors of, and participants’ knowledge about, exclusive breastfeeding. **Results:** Participants in the study were 202 mothers. The rate for initiation of breastfeeding in the first hour after childbirth was 13.9%. The prevalence of exclusive breastfeeding was 16.3%. Knowledge level was great among participating mothers as 65.3% of mothers scored over 75% of the total knowledge score and 95% got more than half of the questions right. Only having 3–6 children ( $P = 0.023$ ) and 1-year interpregnancy interval ( $P = 0.005$ ) were associated with the positive likelihood of exclusive breastfeeding. Baby age ( $P = 0.0218$ ), birth in a private facility ( $P = 0.00843$ ), and university education ( $P = 0.0131$ ) were associated with better knowledge. **Discussion and Conclusion:** Rates of exclusive breastfeeding practice are low in Saudi Arabia despite adequate knowledge about its benefits and necessity.

**Keywords:** Exclusive breastfeeding, knowledge, Saudi Arabia

## Introduction

Breastfeeding is the ideal, unique, and natural method for nourishing the developing infant. Breast milk provides all the first months’ energy and nutrients’ requirements, more than half of such requirements during the following 6 months, and up to one-third during the second year of life.<sup>[1]</sup> Prevalence of breastfeeding varies substantially across the globe, with highest rates are reported from low-income and middle-income countries.<sup>[2]</sup>

Exclusive breastfeeding is the provision of breast milk as the only nutrient received by babies. It reduces common childhood illnesses, strengthens immunity,<sup>[3]</sup> and improves infant survival.<sup>[4]</sup> World Health Organization (WHO) recommends exclusive breastfeeding for up to the first 6 months of life.<sup>[5]</sup> However, its rates are

notoriously low across the Arabic world and in Saudi Arabia.<sup>[6]</sup> Worldwide, mothers struggle to keep a balance between prescribed social influence and personal, self-efficacious, view of parenting. This struggle can negatively affect their decision to exclusively breastfeed.<sup>[7]</sup> Enhancement of breastfeeding depends on societal norms that guide women’s attitudes.<sup>[8]</sup> Regionally, breastfeeding behavior was also largely influenced by knowledge about the benefits associated with it.<sup>[9]</sup> Locally, in contrast, lack of support was cited as one of the important reasons for such low rates of exclusive breastfeeding among Saudi mothers, in addition to a multitude of biological (for instance, chronic diseases and obesity) and cultural factors.<sup>[10]</sup> Indeed, wider between-pregnancy intervals, husband and family support, and vaginal delivery are positive correlates with breastfeeding.<sup>[11]</sup> Certainly, very little is known about Saudi mothers’ awareness of exclusive breastfeeding and its practice.

The study aims to estimate the prevalence of exclusive breastfeeding in Saudi Arabia, the barriers against it, knowledge level about it, and the factors affecting it among mothers.

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## Methodology

This is a cross-sectional study on the basis of face-to-face interview for breastfeeding mothers of infants aged 6–12 months who attended “well-baby clinic.” We used convenience sampling in approaching participants.

The survey was conducted in Alhada Armed Forces Hospital—a modern facility with 569 beds. The study area, Taif, is in the mountains of Saudi Arabia in the Hejaz area, with generous rainfall.

The questionnaire was developed by the researchers to explore predictors of exclusive breastfeeding and participants’ knowledge about it. The items were adapted from recent standardized inventories exploring breastfeeding knowledge and attitudes in the Middle Eastern,<sup>[12]</sup> Asian,<sup>[13]</sup> and African regions.<sup>[14]</sup> It was adapted further by senior neonatologists, pediatricians, family physicians, and public health research experts. All agreed on the final version of the questionnaire in terms of content and face validity. Psychometric properties were evaluated during the conduct of this study. The questionnaire piloted the questionnaire on 20 mothers to ensure better understandability, readability, and time and cost-efficiency of its design. The final agreed version consisted of 12 questions with 3 possible answers: “correct,” “incorrect,” and “do not know.” Correct answers got a score of 1, and a score of 0 was awarded otherwise. Sum of correct answers constituted the final total score. As the total score is count data, its relationship with background covariates was tested using generalized regression binomial modeling to ensure robustness and good-fit to the data.

Statistical analysis was performed using R statistical software version 3.4.1.<sup>[15]</sup> Descriptive statistics were presented as count, percentages, range, medians, means, and standard deviation (SD). Inferential statistics were performed using generalized regression modeling as appropriate. Statistical significance level was set at a *P* value of <0.05.

Ethical approval number REC.T.2018-10-352 was granted from the Regional Research and Ethics committee in Taif and Alhada Armed Hospitals.

## Results

The total number of participants interviewed was 202 mothers. The mean age was 23.4 years (SD = 4.89), ranging between 15 and 44 years, the median age was 31 years [Table 1].

The prevalence of breastfeeding among the participating mothers was 87.1% (n = 176), of whom 73.3% (n = 148) breastfed their babies after the first hour of birth and 13.9% (n = 28) breastfed during the first hour, whereas those who did not breastfeed were 12.9% (n = 26). Moreover, only 16.3% (n = 33) of mothers indicated that they engage in exclusive breastfeeding practice by giving supplementary food only after their baby reached 6 months, whereas the remaining 83.7% (n = 169) indicated otherwise, with 68.3% (n = 138) are willing to add supplementary food before the third month of age, and further

15.3% (n = 31) will give supplementary food at some point between the third and the sixth month of age [Figure 1].

The majority of mothers scored over 75% of the total knowledge score (n = 132, 65.3%), with 29.7% (n = 60) who scored between 50% and 75% and a minority of 5% (n = 10) who scored below 50% [Table 2]. This is indicative of great knowledge among participating mothers. The mean overall

**Table 1: Characteristics of study participants (n=202)**

Characteristic	Frequency (n)	Percentage (%)
Age categories (years)		
15-20	1	0.5
21-25	25	12.4
26-30	70	34.7
31-35	53	26.2
>36	53	26.2
Age (years) mean±SD (median)	23.4±4.89 (31)	
Infant age (months) mean±SD (median)	9.2±2.68 (9)	
Infant gender		
Male	105	52
Female	97	48
Mother education		
Illiterate	5	2.5
Primary	13	6.4
Preparatory	11	5.4
Secondary	56	27.7
University	117	57.9
Employment		
Unemployed	43	21.3
Employed	159	78.7
Time with the baby		
Always with baby	151	74.8
1-2 hours separation	12	5.9
3-6 hours separation	11	5.4
>6 hours separation	28	13.9
Parity		
Once	45	22.3
More than once	157	77.7
No. of children		
<3	110	54.5
3-6	76	37.6
>6	16	7.9
Planning future pregnancy		
Yes	88	43.6
No	114	56.4
Between-pregnancy previous interval		
<1 year	8	4
1 year	18	8.9
2 years	35	17.3
>2 years	106	42.5
No past pregnancy	35	17.3
Postpartum problems		
Yes	63	31.2
No	139	68.8
Childbirth place		
Public hospital	194	96
Private hospital	8	4
Husband support		
Yes	115	56.9
Minimum	60	29.7
No	27	13.4

**Table 2: Knowledge and opinions of study participants (n=202)**

No.	Item	Frequency (n)	Percentage (%)
1	Overall knowledge score: mean±SD		9.86±1.78
2	Overall knowledge category		
	Good (score >9)	132	65.3
	Moderate (score between 6 and up to 9)	60	29.7
	Weak (score <6)	10	5
3	Colostrum is full-nutrient food for neonates		
	Answered correctly	172	85.1
	Answered incorrectly	2	1
	Did not know	28	13.9
4	Best to breastfeed during the first hour of birth		
	Answered correctly	165	81.7
	Answered incorrectly	8	4
	Did not know	29	14.3
5	Continuous crying means thirst or hunger		
	Answered correctly	111	55
	Answered incorrectly	85	42
	Did not know	6	3
6	The more you breastfeed the more milk you will have		
	Answered correctly	182	90.1
	Answered incorrectly	9	4.5
	Did not know	11	5.4
7	It is possible to breast-bump and keep milk for later		
	Answered correctly	132	65.3
	Answered incorrectly	41	20.3
	Did not know	29	14.4
8	Breast milk is clean, safe, and cheap		
	Answered correctly	193	95.5
	Answered incorrectly	5	2.5
	Did not know	4	2
9	Breast milk is whole meal till the sixth month of age		
	Answered correctly	166	82.2
	Answered incorrectly	27	13.4
	Did not know	9	4.5
10	Breast milk gives necessary fluids till the sixth month of age		
	Answered correctly	136	67.3
	Answered incorrectly	36	17.8
	Did not know	30	14.9
11	Exclusive breastfeeding is better for baby's health		
	Answered correctly	194	96
	Answered incorrectly	4	2
	Did not know	4	2
12	Exclusive breastfeeding protects against infections		
	Answered correctly	187	92.6
	Answered incorrectly	3	1.5
	Did not know	12	5.9
13	Exclusive breastfeeding reduces infant colic		
	Answered correctly	169	83.7
	Answered incorrectly	12	5.9
	Did not know	21	10.4
14	Exclusive breastfeeding reduces breast cancer likelihood		
	Answered correctly	185	91.6
	Answered incorrectly	0	0
	Did not know	17	8.4

score was 9.68 (SD = 1.78), ranging between 3 and 12, and the median score was 10.

Only having 3–6 children (P = 0.023) and 1-year interpregnancy interval (P = 0.005) were associated with the positive likelihood of exclusive breastfeeding [Table 3].

In terms of total knowledge score [Table 4], baby age (estimate = 0.045 indicative of an increase in knowledge score by 4.6% for every month increase in age; P = 0.0218), birth in private facility (estimate = 1.0436, translates into an increase of 183% in knowledge score for women giving birth in private hospitals; P = 0.00843), and university

**Table 3: Logistic regression model estimates for the effect of predictors on exclusive breastfeeding**

Covariate	Estimate	Standard Error	P
Infant age (months)	0.100	0.074	0.176
Infant gender: Male	-0.167	0.381	0.661
Mother education			
Illiterate	Reference		
Primary	16.36	1769	1.000
Intermediate	0	2134	0.993
Secondary	16.16	1769	0.993
University	15.93	1769	0.993
Employment			
Employed	-0.232	0.488	0.634
Time with the baby			
Always with baby	0.534	1.074	0.619
1-2 hours separation	2.303	1.197	0.0544
3-6 hours separation	Reference	NA	NA
>6 hours separation	0.511	1.180	0.665
Parity			
Once	-1.961	0.631	0.058
More than once	Reference		
No. of children			
<3	Reference	0.408	0.023
3-6	0.930	0.710	0.372
>6	0.634		
Planning future pregnancy	-0.515	0.401	0.198
Between-pregnancy previous interval			
<1 year	-15.199	1398.7	0.991
1 year	2.144	0.768	0.005
2 years	0.792	0.752	0.293
>2 years	0.640	0.662	0.334
No past pregnancy	Reference	NA	NA
Postpartum problems	0.279	0.399	0.484
Birthplace			
Public hospital	-0.561	0.840	0.504
Husband support			
Yes	1.761	1.037	0.090
Age categories (years)			
15-20	Reference	NA	NA
21-25	13.18	882.74	0.988
26-30	12.77	882.74	0.988
31-35	12.51	882.74	0.989
>36	13.34	882.74	0.988

**Table 4: Binomial regression model estimates for the effect of background factors on the total knowledge score**

Covariate	Estimate	Standard Error	P
Infant age (months)	0.045	0.020	0.0218
Infant gender: Male	-0.164	0.107	0.125
Mother education			
Illiterate	Reference	0.354	0.0949
Primary	0.592	0.353	0.4726
Intermediate	0.253	0.303	0.1120
Secondary	0.481	0.296	0.0131
University	0.734		
Employment			
Employed	0.155	0.134	0.246
Time with the baby			
Always with baby	0.227	0.222	0.305
1-2 hours separation	-0.214	0.287	0.457
3-6 hours separation	Reference	NA	NA
>6 hours separation	0.480	0.264	0.069
Parity			
Once	-1.155	0.124	0.213
More than once	Reference	NA	NA
No. of children			
<3	Reference	NA	NA
3-6	0.166	0.115	0.148
>6	-0.180	0.190	0.343
Planning future pregnancy	-0.009	0.107	0.932
Between-pregnancy previous interval			
<1 year	-0.371	0.271	0.171
1 year	-0.352	0.205	0.086
2 years	0.136	0.184	0.462
>2 years	0.061	0.148	0.680
No past pregnancy	Reference	NA	NA
Postpartum problems	0.103	0.116	0.376
Birthplace			
Public hospital	-1.044	0.396	0.00843
Husband support			
Yes	-0.093	0.160	0.560
Age categories (years)			
15-20	Reference	NA	NA
21-25	0.460	0.627	0.464
26-30	0.882	0.619	0.154
31-35	0.916	0.622	0.140
>36	0.916	0.622	0.140

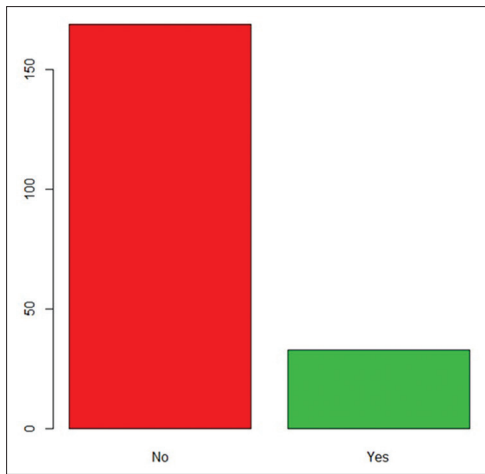
education (estimate = 0.7336, translates into an increase for university-educated mothers by 108% in total knowledge score;  $P = 0.0131$ ) were associated with better knowledge among participating mothers. See Figures 2 and 3 for the visual representation of these significant associations.

Cronbach's alpha value for the Knowledge questionnaire was 0.68 (95% confidence interval between 0.66 and 0.70), indicative of satisfactory internal consistency.<sup>[16]</sup>

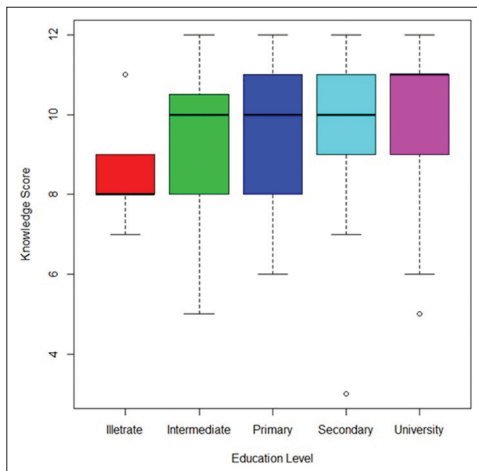
## Discussion

The results of this cross-sectional study revealed that the prevalence of exclusive breastfeeding among mothers in Taif is 16.3%, despite our finding that overall prevalence of

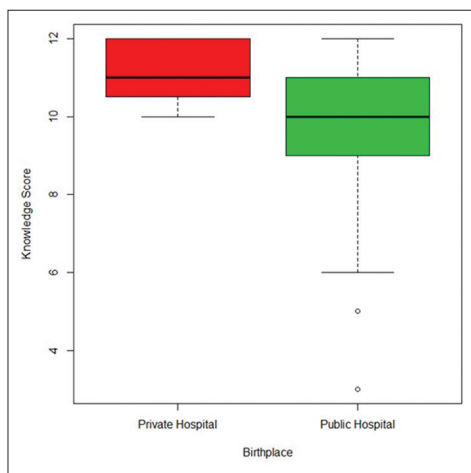
breastfeeding is 87.1%. Our findings confirm the low rates of exclusive breastfeeding as practiced regionally, and globally. The current rate of exclusive breastfeeding in Taif, found by our survey, is lower than the 27.3% rate found by Saudi investigators some 15 years ago,<sup>[17]</sup> which dropped severely further in Saudi Arabia to a staggering 1.7% afterward.<sup>[18]</sup> Around the same time, a local survey estimated that 80.8% of below 6-month-old infants were not exclusively breastfed in Saudi Arabia.<sup>[19]</sup> A very recent improvement to a 31.4% exclusive breastfeeding rate was noted,<sup>[20]</sup> whereas another earlier study found only 8.3% of Saudi female teachers engage in exclusive breastfeeding.<sup>[21]</sup> This erratically worrying downhill trend in exclusive breastfeeding reflects the substantial variability in data across regions and time in Saudi Arabia, which makes interpretation difficult.<sup>[22]</sup> However, the 16.3% prevalence of exclusive breastfeeding,



**Figure 1:** Prevalence of exclusive breastfeeding behavior among participating mothers



**Figure 2:** Association between education level and knowledge score



**Figure 3:** Association between place of childbirth and knowledge score

uncovered by our study, is almost equivalent to the 17% rate reported in Nigeria<sup>[23]</sup> and 12.5% in Egypt,<sup>[24]</sup> but clearly compares less favorably to results published from studies in Zanzibar (20.8%),<sup>[25]</sup> Ghana (38%),<sup>[26]</sup> Bangladesh (36%),<sup>[27]</sup> and

Tanzania (24.1%).<sup>[28]</sup> Indeed, a lot will need to be done in terms of promoting exclusive breastfeeding to Saudi women, specifically in Taif region. Prioritization of the promotion of exclusive breastfeeding could be hypothesized to yield better maternal and child well-being and more efficient and cost-effective public health services.

One important finding from our investigation is the 13.9% rate for initiation of breastfeeding in the first hour after childbirth. This falls well below the 100% target of WHO,<sup>[1]</sup> or even the 65% rate found recently in Nepal.<sup>[29]</sup> Given its established effect on future exclusive breastfeeding practice,<sup>[30]</sup> this very low rate of the first-hour initiation of breastfeeding uncovered by this study could partly explain low rates of exclusive breastfeeding in Taif region. Very limited research was dedicated to early breastfeeding and skin-to-skin contact in the Middle East, despite its proven neonatal health benefits.<sup>[31]</sup>

On the contrary, the findings of this investigation revealed that knowledge about breastfeeding was not deficient among participating Saudi mothers. Of the sample, 65.3% scored above 75% of the knowledge questions and 95% scored more than half of the questions correctly in terms of questions related to awareness about benefits of breastfeeding. This is far better than the 47.8% knowledge level shown by Das *et al.*<sup>[32]</sup> and the 31% level reported by Ouchi *et al.*<sup>[33]</sup> or 42% among Nigerian women surveyed by Abasiattai *et al.*<sup>[34]</sup> At the local level, our results agree with the 78% knowledge level revealed by Elmougy *et al.*'s<sup>[35]</sup> survey in Dammam City in the Eastern Province of Saudi Arabia.

Knowledge about breastfeeding in our sample was significantly enhanced by university education, age of baby, and delivery in private health institute. Expectedly, higher education should improve popular science knowledge, including awareness of breastfeeding. This association between better education and higher knowledge was also observed by Hassan and Abdelwahed<sup>[24]</sup> in their survey of Egyptian mothers. Employment, in our sample, did not exert a substantial impact on knowledge score, in contrast to findings from regional studies.<sup>[24,36]</sup> The finding that private hospital birth coincided with improved breastfeeding-related knowledge is intriguing and warrants further investigation as what different educational (possibly midwives-led<sup>[37]</sup>) interventions are available in such health facilities.

This study showed clearly that only having 3–6 children and 1-year interpregnancy interval were strong predictors of exclusive breastfeeding. The current line of research into exclusive breastfeeding moved away from rigid demographic covariates and follows the important effect of mothers' self-efficacy and planning.<sup>[38]</sup> Our local research policies should follow suit. Speculatively, such social cognitive qualities may have a role in limiting the number of children to between 3 and 6 and maintain regular well-planned pregnancy interval.

The results of our study capture an enormous gap between exclusive breastfeeding knowledge (as 95% of participants got

more than half of the questions right) and practice (as only 16.3% of participants reported practicing it). This is counterintuitive and is against the tide of the international literature indicative of improvement in breastfeeding rates secondary to better health knowledge and education.<sup>[39,40]</sup> However, local studies conducted in Saudi Arabia have been consistent in terms of finding an inverse relationship between knowledge and practice of exclusive breastfeeding.<sup>[21,41,42]</sup> Careful consideration should be devoted to Saudi Arabia to behavioral and geosocial interventions if we want to match the 90% exclusive breastfeeding target endorsed by WHO.

The results of this paper have the potential to help policymakers in Primary Care device-focused educational interventions to improve rates of exclusive breastfeeding in Saudi Arabia. Primary Care physicians are usually the first point of contact for pregnant women and mothers to be. The advice in terms of exclusive breastfeeding from family physicians to this cohort of patients is crucial.

This study has uniquely contrasted knowledge and practices related to exclusive breastfeeding in Saudi Arabia. However, a couple of limitations need to be borne in mind before generalizing its results. Recall bias and social desirability could have played a part in shaping the results. Given the cross-sectional nature of the study, there was little to do to counteract their adverse impact.

Further research direction should implement a longitudinal design to explore the cognitive and social underpinnings of exclusive breastfeeding behavior.

## Conclusion

In conclusion, findings indicated that low exclusive breastfeeding practice exists in Saudi Arabia despite adequate knowledge about its benefits and necessity. It is recommended that more research should focus on the social and cognitive determinants of exclusive breastfeeding in Saudi Arabia and the Middle Eastern region.

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## Conflicts of interest

There are no conflicts of interest.

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