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RESEARCH ARTICLE

PREVALENCE AND FACTORS ASSOCIATED WITH EXCLUSIVE BREASTFEEDING AMONG MOTHERS ATTENDING WELL-BABY CLINIC AT AL-NAWARIYAH PRIMARY HEALTH CARE CENTRE IN MAKKAH AL-MUKARRAMAH, SAUDI ARABIA, CROSS-SECTIONAL STUDY, 2018

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ABSTRACT

Background: The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) strongly recommend exclusive breastfeeding (EBF) for the first six months of the infant's life to achieve optimal growth, development, and health. This study aimsto estimate the prevalence of EBF up to the age of six months and to identify the factors associated with EBF among mothers that attended the Well-Baby Clinic,Al-Nawariyah Primary Health Care (PHC)Center, Makkah, Saudi Arabia in 2018. ***Methodology:*** A cross-sectional study of125 mother swho attended the Well-Baby Clinic, Al-Nawariyah PHC Center, Makkah, Saudi Arabiain January 2018,using a validated self-administered questionnaire in the Arabic language. ***Result:*** A sample of125 mothers, 52.4% of which used mixed feeding, 25.4% used artificial feeding, 16.6% used breastfeeding with water and other supplements, and 5.6% used EBF during the first six months after birth. Mothers who were properly educated on EBF were more likely to practice it compared to those who received improper or no education about EBF (16%, 0%, and 7.1% respectively; p=0.006). The top three barriers to EBF were insufficient breast milk (37.6%), the belief that breast milk alone is not enough for growth (24.8%), and the lackof awareness about the importance of EBF (20.8%). There is no significant relation between EBF and any of the following: mother's age, mother's education level, employment status, and family income. ***Conclusion:*** The current study results conclude that EBF rate is significantly low (5.6%). The present study showsa significant relation between EBF and proper health education regarding EBF.

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INTRODUCTION

The majority of infants below six months need a complete source of nutrition necessary for growth. Feeding an infant at this age is either by exclusive breastfeeding (EBF), partial breastfeeding (PBF), or bottle-feeding. According to the World Health Organization (WHO), EBF refers to feeding an infant on breast milk only. No other liquid or solid food is given, including water, with the limitation of oral rehydration suspension, or drops/syrups of vitamins, minerals, or medications [(1)]. PBF is combining breastfeeding with bottle feeding and/or complementary food. Bottle feeding refers to feeding an infant on milk-based formula [(2)]. Breastfeeding, whether EBF or PBF, is better than bottle-feeding since it provides all the energy and nutrients the infant needs for healthy growth and development. It improves neurodevelopmental outcome and protects the infant against infectious and chronic diseases [(1, 3, 4)].

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Increasing the percentage of breastfeeding could save more than 800,000 lives every year on the near-universal levels [(5)]. In a review,it was found that in countries with high rates of child death, breastfeeding was significantly associated with mortality reduction [(3)]. Undoubtedly, breastfeeding is the most essential and necessary nutrition for infants. As Muslims, it is appropriate to highlight that breastfeeding is mentioned in the Holy Quran eleven times. The Holy Quran encourages breastfeeding until the age oftwo years which it considers the ideal duration to get the maximum benefit. Breastfed infants are better immunized against infectious diseases. In low- and middle-income countries, nearly half of all diarrheal conditions and one-third of all respiratory infections in children could be prevented with increased rates of breastfeeding [(3, 5, 6)]. Additionally, the incidence ofacute otitis media and the rate of hospitalization for urinary tract infections are reduced in breastfed compared to bottle-fed infants [(3)]. Longer duration of breastfeeding helps reduce the incidence of chronic disease such as diabetes type 1 and 2, certain allergic conditions such as atopic dermatitis and bronchial asthma, acute coronary heart syndrome in adulthood, as well as inflammatory bowel disease and cancer such as leukemia [(3, 5, 7)].

Breastfeeding is significantly associated with children's intelligence and cognitive functions, according to the systematic review and meta-analysis by Horta et al. [8]. Breastfeeding seems to have analgesic effects, as the breastfed infants experience less stress during painful procedures than bottle-fed infants [3]. According to a meta-analysis by Yan et al. performed in 2014, breastfeeding is a significant protective factor against overweight and obesity in children [9]. Data from the millennium cohort study suggested that breastfeeding for four months and longer is associated with lower risks of behavioral problems in children at five years of age in comparison with a shorter duration of breastfeeding [10]. Besides, the systematic review and meta-analysis suggested that breastfeeding reduces the mother's risk of developing ovarian cancer, breast cancer, and type 2 diabetes [11]. At current breastfeeding rates, an estimate of 20,000 mortalities from breast cancer is prevented [5]. Moreover, breastfeeding decreases the risk of cardiovascular diseases (CVD), helps with weight loss, and is considered a contraceptive method [7, 11, 12].

In summary, partial breastfeeding, compared to bottle-feeding, is associated with lower risks of infection-related mortality, decreased subsequent specific chronic disease, decreased acute illnesses, and improved neurodevelopmental outcome [3, 13]. A review of the available evidence has shown that EBF reduces infant mortality resulting from common childhood illnesses such as diarrhea andpneumonia and helps with faster recovery compared to PBF [1, 13]. In particular, EBF for at least six months provides better protection against respiratory tract infections and gastrointestinal diseases compared to EBF for four months only [14]. According to Gupta et al., EBF could prevent 1.4 million child deaths and 44 million disability-adjusted life years [6]. Hence, the WHO and the United Nations Children's Fund (UNICEF) strongly recommend EBF for the first six months of the infant's life to achieve optimal growth, development, and health. Thereafter, continued breastfeeding, along with complementary foods, up to the second year of life or beyond is recommended [15]. According to WHO's World Health Statistics 2013, estimated global exclusive breastfeeding among infants younger than six months is 37%, meaning one in three infants is exclusively breastfed [4, 6]. In the Middle East, it varies around39.7%, 32.8%, 10.3%, 29.3%, and 22.7% in Egypt, Oman, Yemen, Qatar, and Jordan respectively [16]. While in Saudi Arabia, it varies from 9.5% in Qatif to31.4% in Tabuk according to the literature, which is estimated overall as 20%, and that is below the average [17-21]. EBF forthe first six months is strongly recommended by the WHO and the UNICEF as it significantly decreases infantmorbidity and mortality rates [1, 3, 13]. Although the WHO has projected that EBF rate would reach 50% by the year 2025,the average prevalence of EBF in the KSA is 20% according to the literature. Azzeh, F. S. studied the prevalence of EBF in Makkah 5 years ago , and found a very low rate of 14.4% [20]. This very low rate could have been a reflection of the lack of awareness of the importance of EBF, especially since there was no baby-friendly hospital in Makkah until early 2018. Thus, in order to support the BFHI accreditation by MOH, we intend to update our knowledge on the rate and factors affecting EBF in PHC Centers in Makkah, starting with Al-Nawaryah PHCC which was chosen randomly. This study aims to assess the rate of exclusive breastfeeding and to analyze the factors that influence exclusive breastfeeding, in order to raise awareness and help increase the practice ofEBF.

MATERIALS AND METHODS

This is an analytical cross-sectional study of mothers who attended the Well-BabyClinic at Al-Nawariyah Primary Health Care Center in Makkah, Al-Mukarramah in January 2018. This primary health care center was chosen randomly, via random.org, from a group ofthe most crowded centers as per the suggestion of Dr. Abdullah Turkistani, the Coordinator at the Public Health Department ofthe General Health Affairs Directorate, Makkah City. Al-Nawariyah PHCC consists of 4 clinics – General, Chronic Disease, Maternal Care, Well-Baby – and provides different health services to 6 residential quarters. The study included all mothers who had infants between six and eighteen months old during the study period and could speak and read the Arabic language, regardless of their nationalities. The sample was selected based on Al-Nawariyah PHC Center statistics; the estimated population was approximately 250. There is a variation in the rate of EBF between the different provinces in Saudi Arabia. However,the literature review showed that the average prevalence ofEBF in KSA is 20%. Based on a confidence level of95% anda margin of error of5%, the sample size was calculated as 125 mothers using Raosoft sample size calculator. The non-randomized sampling technique was used due to time limitation.

A self-administered, validated questionnaire in the Arabic language was used for data collection. The survey consisted of three parts: first, the socio-demographic data; second, feeding practices, mother's belief and awareness; and finally, the factors associated with exclusive breastfeeding. The questionnaires were distributed to eligible mothers in the waiting area of the Well-Baby Clinic after getting their written consent. To avoid missing data, the investigator was available in the waiting area to collect the questionnaires herself and ensure they were completely filled. Handouts were distributed during data collection to increase participants 'awareness of EBF. Exclusive breastfeeding is the dependent variable in this study, and the independent variables, which are the possible factors associated with EBF prevalence, are education level, occupation, income, awareness level of EBF, mother's belief about EBF, health status of the mother, health status of the infant, preterm baby, and low birth weight. The data was collected, verified by hand, and coded before entry. IBM SPSS version 24 (IBM Corp, Armonk, NY) was used for data entry and analysis. A value of less than 0.05 was considered statistically significant.

In order to test the applicability of the tool and technique, a pilot study was conducted involving10% (13 mothers) of the actual population sample. It was done at Iskan Primary Health Care Center, chosen randomly via random.org. For ethical considerations, the researcher gotwritten approval from the Al-Nawariyah PHC Center director and the higher authorities in MOH.As previously mentioned, all participants gave their written consent, and confidentiality was taken into consideration. Thus, the respondents were assured that their personal information would not be disclosed except for the purposes ofthe study.

RESULTS

The study included 125 mothers, with a response rate of100%. Table 1 summarizes the socio-demographics of the sample population and the factors associated with EBF.

	Exclusive breastfeeding		p-value
	No N=118 N (%)	Yes N=7 N(%)	
Age (years	61 (96.8)	2 (3.2)	
<30 (n=63)			
≥30 (n=62)	57 (91.9)	5 (8.1)	0.213**
Nationality	104 (96.3)	4 (3.7)	
Saudi (n=108)	14 (82.4)	3 (17.6)	
Non-Saudi (n=17)			0.052**
Education level			
Below university (n=63)	58 (92.1)	5 (7.9)	
University/above (n=62)	60 (96.8)	2 (3.2)	0.226**
Employment status			
No (n=112)	106 (94.6)	6 (5.4)	
Yes (n=13)	12 (92.3)	1 (7.7)	0.546
Socio-economic Status			
Low (n=20)	19 (95.0)	1 (5.0)	
Medium (n=99)	93 (93.9)	6 (6.1)	
High (n=6)	6 (100)	0 (0.0)	0.815
Knowledge of EBF definition			
Knowledgeable (n=39)	38 (97.4)	1 (2.6)	
Unknowledgeable (n=86)	80 (93.0)	6 (7.0)	0.297**
Receiving health education about EBF			
No (n=42)	39 (92.9)	3 (7.1)	
Proper education (n=25)	21 (84.0)	4 (16.0)	
Improper education (n=58)	58 (100)	0 (0.0)	0.006*

* Chi-square test ** Fischer Exact test

Table 2. Barriers to exclusive breastfeeding among the participants

	Frequency	Percentage
Lake of awareness about EBF importance	26	20.8 %
Lake of family support	3	2.4 %
Mother's belief breast milk alone is not enough for growth	31	24.8 %
Mother's belief formula is better to increase baby weight	5	4.0 %
Formula is fortified with vitamins and iron	3	2.4 %
The need for herbs in care of infant colic	15	12.0 %
Insufficient breast milk	47	37.6 %
The mother is employed\student	16	12.8 %
The mother having chronic disease or on medication interfere with lactation	3	2.4 %
Cesarean section pain	5	4.0 %
Low birth weight baby	10	8.0 %
Others	12	9.6 %

Non-Saudi mothers were more likely to exclusively breastfeed their infants in the first six months than Saudi mothers (17.6% versus 3.7%). However, the difference was borderline, not significant (p=0.052). Other studied socio-demographic factors (age, educational level, employment status, and socio-economic status) were not significantly associated with EBF (Table 1). Also, there was no significant association between knowledge of EBF and practice as can be seen in Table 1. Mothers who reported receiving proper health education regarding EBF were more likely to practice it compared to those who received improper knowledge or never received health education about EBF (16% versus 0% and 7.1% respectively; p=0.006) (Table 1). From Table 2, the most common reported barrier to exclusive breastfeeding among mothers who attended the PHC centers was insufficient breast milk (37.6%), followed by the mothers' belief that breast milk alone was not sufficient for the infants' proper growth (24.8%), lack of awareness of the importance of EBF (20.8%), being employed or a student (12.8%), and the use of herbs to relieve infant colic (12%).

Slightly more than half of the mothers (52.4%) subjected their infants to mixed feeding, whereas only 22.2% breastfed them. Among them, only 7 mothers exclusively breastfed their infants. Thus, the prevalence of exclusive breastfeeding was only 5.6%. Moreover, less than one-third of the mothers (31.2%) could recognize the correct definition of exclusive breastfeeding.

Among the unknowledgeable mothers, 28% believed that EBF was breastfeeding with the addition of water or anise whenever necessary, and 40.8% thought it was adding artificial milk to breast milk. It is realized from the study that 46.4% of mothers received improper health education regarding EBF, whereas only 20% had the proper knowledge. About one-third of them (33.6%) had no health education about EBF. Figure 1 shows that the rate of EBF in the current study was as low as 5.6%, whereas the EBF rate was 14.4% in another study conducted in Makkah in 2014. However, there were different rates of EBF among the cities in Saudi Arabia from different regions (south, north, east, and west), extracted from the literature.

DISCUSSION

This study surveyed a total of 125 mothers from Al-Nawariyah PHCC in Makkah, established in 2017, with the aim of detecting the prevalence and factors associated with EBF. Additionally, there was a particular focus on mothers' knowledge of EBF using different definitions, to evaluate the quality of health education. We have seen that the EBF rate during the first six months of infant life was only 5.6%, which is much lower than the reported average of 33% in the Middle East and 41% globally by UNICEF in 2018 [22]. This study results are considerably far from the goals set by the WHO of having 50% of infants being exclusively breastfed in their first six months by 2025[15].

Although a very low rate of EBF 5.6% was obtained, , this result is close to the result from a study conducted in Qat if district of Saudi Arabia (9.5%), and globally from studies conducted in Denmark (7%), Norway (7%), Somalia (5.3%), Gabon (5.1%), and Dominican Republic (4.6%)[16, 17, 23]. The rate of EBF in the current study is lower than those reported by other researchers in Saudi Arabia, such as 51.3% in Dammam, 31.4% in Tabuk, 24.4% in Al-Hassa, and 21.6% in Riyadh [19, 24, 25]. Moreover, current study rate of EBF is far lower than the rates of EBF identified by other studies indifferent countries, such as 70.5% in Ethiopia, 50.8% in Sri Lanka, 49.8% in Indonesia, 49% in Nigeria, 46.5% in Iran, 45.5% in Nairobi, 33% in Jordan, 29.9% in Egypt, and 24.3% in Qatar [16, 26-35]. However, the rate in this study is higher than that in Saint Lucia (3.5%), Al-Kuwait (2%), Finland (1%), and Chad (0.1%) [16, 36]. The EBF rate was 14.4% in another study conducted in Makkah in 2014, as shown in Figure 4, as against the 5.6% obtained in the current study conducted in the northern region of Makkah. This variation could be as a result of different cultural habits, beliefs, and levels of health education among the different regions in Makkah. Furthermore, the current study result shows that there is no statistically significant correlation between EBF and all studied factors except for health education, and this is in agreement with data from a study in Riyadh (2015) and Arar city (2016), which found no association between EBF and these factors [18, 37]. This statistical insignificance could be attributed to the small sample size of the study. Therefore, studies with larger sample sizes are needed. In contrast to the current study findings, the relationship between these factors and EBF was significant in other studies. Some studies conducted in several cities, including Makkah, Tabuk, Qatif, and Al-Hassa, found that employed mothers were less adherent to EBF than housewives [17, 19, 20, 24]. In this study, about 12.8% of the studied sample stated that their jobswerea clear barrier to EBF. However, the majority of the studied sample (89.6%) were unemployed, and the significance in relation could not be detected due to a very low number of employed/student mothers. Additionally, many studies have shown contrasting results for the relationship between EBF rate and mother's education level. A study conducted in Makkah in 2014 concluded that mothers with education level below university (non-academic) show higher rates of EBF than those with academic education level. Another study conducted in Jeddah and Taif, two cities close to Makkah, found similar results [38]. Conversely, a study conducted in Denmark in 2014 found that a higher level of education (university or above) was associated with a higher rate of EBF [23].

The current study result indicates that there is no significant correlation between socioeconomic status and EBF rate. However, 93.9% of the studied sample fell within the middle-income level. Hence, the uneven distribution of the sample could have affected the results. The data from a qualitative & quantitative governmental study conducted in Indonesia in 2010 showed that mothers with high socioeconomic status had the highest prevalence of EBF [35]. Similarly, the data from a meta-analysis conducted in Madrid (Spain) in 2014 revealed that medium-high socioeconomic status hada positive association with EBF [9]. On the other hand, many studies revealed that higher socioeconomic status is associated with a lower rate of EBF. For instance, in Saudi Arabia, studies conducted in Riyadh, Dammam, and Al-Hassa showed that mothers withhigh socioeconomic status were less likely to practice EBF [21, 25].

According to the UNICEF, poorer mothers tend to breastfeed longer in developing countries, while wealthy mothers doin developed countries. A possible explanation is that wealthy mothers in developed countries often hire maids to take care of the household chores while they take care of their infants. Conversely, high socioeconomic status could be the barrier to EBF, for example, the mother could hire a nanny to assist with childcare and feeding, which is often seen in the Middle East. However, the variation between the results of the studies can be explained by the different societal characteristics and cultural habits. Saudi women are currently becoming more educated and employed, and they are likely no longer willing to accept the traditional motherhood role. Thecurrent study showsa significant relation between EBF and proper health education regarding EBF (*p-value*= 0.006). Mothers who received appropriate health education were more likely to practice EBFcompared to those who never received or received improper knowledge, in which (*p-value*= 0.006). To the best of the researcher's knowledge, there no study yet has tested mothers' knowledge by using different definitions of EBF and evaluatingthe quality of health education. The current study reveals that the majority of the mothers (66.4%) received education about EBF. 46.4% defined EBF incorrectly, and only 20% provided the right definition. This misconception in the exact meaning of EBF among mothers could be either the fault of the healthcare provider/educator or of the mothers themselves. Health care provider's/educator's knowledge, mode of education (teaching), explaining, and following up on the mothers are all supposed to play major roles, including mothers' mental capability or understanding.

Overall, the majority (68.8%) of the total sample provided an incorrect definition of EBF (educated/not educated). Nearly one-third (31.2%) defined EBF correctly (WHO definition). Therefore, focusing on proper education about EBF is strongly needed and will have a significant effect. One ofthe possible explanations for the improper education is that Heraa General Hospital, which covers the study area, is not part of the accredited Baby-Friendly Hospital Initiative (BFHI). Additionally, the gap between the actual practice and the recommended practice (EBF) reflects the presence of barriers that could strongly affect EBF. The top 5 reported barriers to EBF among mothers in this study were: insufficient breast milk (37.6%), followed by the belief that breast milk alone is not enough for growth (24.8%), lack of awareness of the importance of EBF (20.8%), being employed/student (12.8%), and the use of herbs tea to relieve infant colic (12%). Addressing these barriers and finding appropriate practical solutions could help in improving the rate of EBF. Regarding insufficient breast milk, providing approved pharmacological/non-pharmacological treatment is necessary and most likely will lead to a significant increase in EBF duration. Mothers who believe that breast milk alone is not enough for growth need focused and qualified education on the importance of breast milk, just like mothers who lack awareness of the importance of EBF. Employed and student mothers should be educated on how to use a breast pump and how to store the milk. Additionally, the workplace should be equipped and facilitated to help mothers in this mission. Infant colic due to gases is another widespread challenge. In that case, many mothers tend to feed the infants traditional herbs or anise tea (yansoon). However, the health provider can teach the mother how to give certain abdominal massages and adjust the baby's position to relieve the colic. Pharmacological treatment could be another choice for more severe cases.

As seen in this study, 21 mothers fed the infantsyansoon; however, if they were properly educated, the rate of EBF could have been increased. Two studies conducted in Kuwait and one in the Islamic Republic of Iran found that family support, especially from the husband and grandmother, strongly influences the mother's feeding practice [32, 36, 39]. On the Theory of Planned Behavior (TPB), expectant mothers with the intention to breastfeed often show more adherence to EBF in the first six months (Lebanon, Iran, and Riyadh) [18, 32, 40]. Many authors suggest that there are significant mediators beyond individual intent which might alter breastfeeding practice. Finally, this study EBF rate (5.6%) cannot be generalized to the whole of Makkah since this study sample was taken from Al-Nawariyah PHC Center, which only represents the northern region.

Conclusion

The current study results show that the EBF rate is significantly low (5.6%) among the studied sample. It is far lower when compared to the current WHO goal of having 50% of infants being exclusively breastfed in the first 6 months by the year 2025. This study showsa significant relation between EBF and proper health education regarding EBF. Mothers who received proper health education were more likely to practice EBFcompared to those who never received or received improper education. Thus, proper education on EBF is clearly needed and has a significant effect. The top 5 reported barriers to EBF among mothers in this study were: insufficient breast milk, the belief that breast milk alone is not sufficient for infants' growth, the lack of awareness of the importance of EBF, being employed/student, and the use of herbs to relieve infant colic.

Recommendations

Based on the foregoing results of this study, below are the researcher recommendations:

- The ten steps recommended by UNICEF for successful breastfeeding [22] should be applied.
- Hospital and PHC staff need to be retrained/updated on EBF through intensive health education programs, courses, and workshops to enhance knowledge and skills.
- Hotline calls consultation services, available 24 hrs/day, and lactation management units should be activated to help mothers overcome the obstacles/concerns and answer their questions regarding breastfeeding and postpartum issues.
- Workplaces should be supported to provide facilities such as breast pumps, rooms for feeding, and nurseries to keep the babies near their mothers.
- A cohort study involving a larger sample size would be the most appropriate next step to gain a full insight into actions that could bridge the gap between the actual practice and mere knowledge of EBF.

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