Factors Associated with Breastfeeding Patterns in Western Saudi Arabia: A Literature Review

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Abstract: According to literature initiation of breastfeeding is common but exclusive breastfeeding is last one month post delivery in most Saudi women, where continuation to exclusively breastfeed is still challenging. This review discussed breastfeeding patterns, factors associated, and possible approaches to prolong breastfeeding duration in Saudi Arabia. Our review has shown that the early introduction of formula makes the mixed-feeding the most popular feeding method used among the Saudi population. The most frequent reason reported was insufficient milk followed by medical and lifestyle factors. Younger, employed, and higher-educated women were found to be less likely to breastfeed therefore a greater effort probably is required with those women. According to literature, the Baby-Friendly Hospital Initiative (BFHI) was found to be an effective tool in increasing breastfeeding duration worldwide, in Saudi Arabia only one study has published and found that BFHI is effective in initiating breastfeeding but formula was introduced after hospital discharge. We recommend increasing Saudi women's confidence about breastfeeding, educating them and introducing other strategies such as peer counselling.

Keywords: Breastfeeding, Baby-Friendly Hospital Initiative, Nutrition education, peer support, breastfeeding initiation, breastfeeding confidence.

1. INTRODUCTION

Breastfeeding is the best way to provide young infants with the nutrients they need for healthy growth and development [1]. Breastfeeding is important and strengthens the bond between mothers and their infants [2]. In addition, benefits for mothers to reduce the incidence of breast and ovarian cancer [3-5], more rapid maternal weight loss after giving birth [6, 7], and reduced incidences of cardiovascular disease and hypertension [8]. Furthermore, several benefits are associated with infant's health as well, which include a significant reduction in the incidence of childhood infections such as gastrointestinal infections, significant reductions in developing asthma and ear infections, and a decreased risk of later obesity for infants who are exclusively breastfed for six months [9]. In addition to the benefits for mothers and their infants, breastfeeding is also associated with economic and environmental benefits [10]. Despite all these benefits, many mothers discontinue exclusive breastfeeding before six months or any breastfeeding between 6-24 months [11, 12]. Before 2001, the World Health Organization [13] recommendation for breastfeeding was to exclusively breastfeed for 4-6 months with the introduction of complementary food beyond 4 months and to continue breastfeeding with appropriate complementary foods up to 2 years of age. In 2001, the WHO set a new recommendation that recommended mothers exclusively breastfeed infants for 6 months and continue breastfeeding with appropriate complementary foods for up to 2 years of age [6]. This recommendation was adopted by numerous health organizations around the world such as the American Academy of Pediatrics [14], Saudi and New Zealand Ministries of Health and UNICEF.

In Saudi Arabia, however, the recommendation for the overall duration of breastfeeding, without specifying the type of breastfeeding. Moreover, the Saudi Arabian Ministry of Health (SAMOH) also adopted the WHO recommendation for the optimal duration of any breastfeeding and exclusive breastfeeding for 6 months [15].

Despite the many benefits of breastfeeding for mothers and infants, the rates for the initiation of breastfeeding vary in developed countries. Initiation in Europe, Australia, and Saudi Arabia is higher than New Zealand, Canada and the USA with 74-99 % in Europe [16], 91-97% in Australia [16], 91.6% in Saudi Arabia [17], compared to approximately 80% in New Zealand (Maori and Pacific's people have lower rate) ,69-83% in Canada and 27-69% in the USA [16]. In general, it was reported that Saudi Arabia is a country with a high breastfeeding initiation rate, which implies the willingness of Saudi women to breastfeed [18, 19]. However, even though Saudi Arabia has a high initiation rate which is over 90%, this rate drops to approximately 49% at 1 month, 36% at 2 months, 20.5% at 4 months, 10% at 6months, and 1.8% at 12 months [19]. Many studies conducted in Saudi Arabia

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suggested that breastfeeding education is needed and important for Saudi women and is needed to correct some of the misperceptions about breastfeeding [20-22]. It was reported that health education improved breastfeeding practices of mothers [23]. Besides, it has been reported that Saudi women have a lack of breastfeeding education and information about the nutritional benefits of breastfeeding may motivate mothers to breastfeed their babies [24]. A study conducted in 2011 by Habib *et al.,* who have examined the antenatal care in primary health centres in Madina, in the western part of Saudi Arabia, found that health promotion, which included counselling on new-born care and breastfeeding, had the best scores on tasks performed at the antenatal care [25].

1.1. Breastfeeding Patterns in Saudi Arabia

Breastfeeding patterns in Saudi Arabia have shown a high initiation rate of breastfeeding, of over 90% [26-28]. However, there is a decline in exclusive breastfeeding with the early introduction of infant formula, resulting in mixed-feeding as the most common feeding method used among Saudi women [19]. Some of the studies have included both Saudi and non-Saudi women [9, 29]. Therefore, results of breastfeeding outcomes could be affected by ethnicity, as reported earlier that Saudi mothers were more likely to introduce an infant's formula earlier than non-Saudi women. Some studies have clearly defined breastfeeding categories [19, 30-32], but many studies have not [22, 27, 33-36] which makes it difficult in reviewing and distinguishing the different breastfeeding patterns in Saudi Arabia. Almost all studies were cross-sectional studies such as Al-Ayed and Qureshi [37] and Al-Hreashy, Tamim [26]. Many studies recruited subjects during the routine visits for vaccination which is not a very good way to get a random sample as most people were from lower socio-economic level such as studies by Al-Jassir [38] and Al-Hreashy, Tamim [26].

1.1.1. Initiation and Timing of Breastfeeding in Saudi Arabia

Mothers in Saudi Arabia have shown to encounter high breastfeeding initiation rates which are reported in numerous national surveys conducted in different regions of Saudi Arabia. Nationwide studies by El-Mouzan [19] and Al-Jassir, El-Bashir [20] both reported initiation rate of 92%. Regional studies reported breastfeeding initiation with 98.9% [38] and 95% [26] in Riyadh (central region), 90% [27] in Jeddah (western region), and 91.9% [22] in Al-Hassa (eastern region), where high initiation rates reveal the willingness of Saudi mothers to breastfeed. The WHO recommends initiating breastfeeding within the first hour postpartum (WHO, 1991), to ensure that infants receives the first milk 'colostrum' and improve lactation and milk flow [10]. In a Saudi nationwide survey, 23.2% initiated breastfeeding within first hour postpartum [19]. Al-Othman, Saeed [21] surveyed the central region of Saudi Arabia and found that one-third of women initiated breastfeeding immediately postpartum, and half of them initiated breastfeeding during the first six hours postpartum. In studies undertaken in the eastern region, only 11% of women initiated breastfeeding within the first hour postpartum [22, 30]. Whereas, in the western region (Mecca) 38% of women initiated breastfeeding within the first hour [39]. However, breastfeeding initiation was delayed from two to 23 hours among 35.5% of women in the study by El-Gilany, Sarraf [22], and 77.8% in a study by Amin, Hablas [30], and by Dorgham *et al.* [32]. In addition, delayed initiation was between 24 and 72 hours postpartum up to 35.0% [22] and 13.1% [30].

1.1.2. Exclusive Breastfeeding and Missing Feedings in Saudi Arabia

The WHO collected data in 1991 and reported that 55% of Saudi mothers were exclusively breastfeeding infants under four months old [40]. UNICEF collected data in 1996 and 31% of women were exclusively breastfeeding between four and six months (UNICEF, 2009). Other nationwide studies report similar exclusive breastfeeding rates: 31.5% between four and six months of infant age [36], 38% during the period between six and 12 months, and dropped to 18% after one year of infant life. A nationwide study found that mothers living in different regions reported different breastfeeding practices. For example, it was reported that mothers from the western region were more likely to exclusively breastfeed (28.4%) compared with mothers from the central (20.4%), northern (19.4%), eastern (18.4%) region. Mothers in the south-western region were found to be least likely to exclusively breastfeed (13.4%) [36]. One of the most important reasons may be due to the level of awareness and education level among women in the western region, which is worth looking at in future research. Regional studies which have been carried out in eastern regions (Al-Hassa and Al-Khobar) found that the percentage of exclusive breastfeeding was 64% at two months [22], 23% at six months [33], and dropped to 14.1% at one year of age [41].

Nationwide surveys have reported the introduction of the formula by 51% of women at one month [19],

48% - 76.1% at three months [20, 36], and 98% at 12 months [19]. Mixed-feeding is the most popular feeding pattern in Saudi Arabia for infants aged less than 5 months [42]. A nationwide study by Murshid [36] found that overall (infants aged between 4- 6 months) the mixed-feeding rate was 42% and he reported that the proportion of mothers who used mixed-feeding was highest in the central region (33.6%) and lowest in the eastern region (12.5%) of Saudi Arabia. Al-Yousif *et al*. (2011) reported that 79.5% of mothers were using mixed-feeding, even though they reported having good knowledge and attitudes about breastfeeding [43]. Indeed, the introduction of formula led to a fast reduction of breastfeeding, which likely failed breastfeeding [39].

2. FACTORS ASSOCIATED WITH BREASTFEEDING PATTERNS IN SAUDI ARABIA

2.1. Age

Studies in Saudi Arabia about the association between breastfeeding and parity and age of mothers are inconclusive. Shawky and Abalkhail [28] found that there was no significant relationship between either mother's age or parity, and breastfeeding. However, Kordy, Ibrahim [44], Al-Shehri, Farag [34], and Al-Madani, Vydelingum [33] found that younger mothers aged less than 30 years were less likely to breastfeed, and more likely to introduce formula [44].

Mothers who were younger at marriage were found to be more likely to breastfeed [21]. Additionally, Al-Yousif *et al*. (2011) found that there is a positive association between family size and breastfeeding practice [43].

2.2. Delivery Status

The delivery mode (vaginal or caesarean) as well as using contraceptive pills [45] was also associated with stopping breastfeeding and introducing formula [28, 32]. Mothers who delivered by caesarean (OR= 1.9) and those who were consuming oral contraceptives (OR= 1.5) were at higher risk of stopping breastfeeding and introducing formula to their infants [28, 41]. A recent systematic review suggested that early breastfeeding was significantly lower among mothers who delivered via caesarean [46]. Therefore, birth weight and gestational age were found to be significantly related to feeding patterns. A cross-sectional study conducted in Al-Hassa (eastern region) found that normal-weight and full-term infants were more likely to exclusively breastfed [47]. Marital status was also found to be significantly associated with breastfeeding patterns. A cross-sectional nationwide study found that married and widow mothers were more likely to use exclusive formula feeding, whereas divorced mothers were more likely to use mixed-feeding [19].

2.3. Parents Education Status

The Ministry of Civil Service (MCS) in Saudi Arabia stipulated maternity leave for 60 days with full payment. Also, MCS offers another form of leave, called "new-born care leave" that can be granted to working women for up to three years with a quarter of the payment, however only women who are working in government sectors get the benefit of the new-born care leave (Ministry of Civil Services, 2011). Most studies have reported that working mothers likely to breastfeed compared with at-home mothers [18-21, 27, 28, 33, 36, 38, 41]. Only one study reported no association between mother's occupation and breastfeeding duration, but this study was conducted in rural areas 20 years ago, where most women did not work and had relatively low education at that time [44]. The relationship between education level and mother's initiation and duration of breastfeeding was mentioned in many international studies, such as the literature review by Callen and Pinelli [16] and primary research studies by Bertini [48, 49], Di Naploi [50], and Li Fein [51]. Studies carried out in western countries reported that education level is positively associated with breastfeeding initiation and duration [16]. On the other hand, in Saudi Arabia, most studies report that educated women are less likely to breastfeed their infants than their illiterate or less educated peers [44, 52]. This is attributed to the adoption of modern technology or new life-style [11], the change in food habits, and sociocultural changes, such as Saudi Arabia becoming an industrialized country [53]. Al-Ayed and Qureshi [37] and Fida and Al-Aama [27] reported that there was no association between education level and breastfeeding practice, whereas Al-Othman Al-Othman, Saeed [21] reported that educated women are more likely to breastfeed.

2.4. Sources of Breastfeeding Information in Saudi

During the 1990s Saudi women mainly obtained breastfeeding information from their relatives [33, 44]. More recently, women appear to mostly get information on breastfeeding from health professionals (44.9%) compared with relatives (26%) or media (17%) [35]. A review by Al-Jassir, El-Bashir [20], found that 44.9% of

women nationwide received postpartum breastfeeding education from medical personnel. It was also reported that Saudi mothers receive less breastfeeding education than non-Saudi mothers [20]. A regional study conducted in the western region by Fida and Al-Aama [27] reported that 65.6% of women in the study received information about breastfeeding, but most information was provided by relatives. However, a study conducted in the central region by Alwelaie, Alsuhaibani [35] stated that 54.2% of women received postpartum breastfeeding education while in hospital and 78% of women in the study tried to find information about breastfeeding by themselves, which implies that Saudi women are interested in knowing about breastfeeding. Therefore, breastfeeding information provided by health professionals as part of prenatal care will help to maintain breastfeeding [23]. Differences between studies could be due to the differences in regions, hospital policies, and in time the studies were conducted in, as the study by Fida and Al-Aama [27] was conducted between October 2001 and September 2002, whereas Alwelaie, Alsuhaibani [35] study was conducted in July 2009. Recently, health professionals are more aware of the importance of breastfeeding and provide more encouragement to women [25] conducted a study to assess services provided by antenatal care in primary health care centres in Madina (western region). The researchers designed their data collection form by using the WHO antenatal care and checked the services provided in different primary care centres. Researchers found that the best-performed tasks were in health promotion domain: nutritional advice (63.7%) and counselling on newborn care including breastfeeding education (39.8%). This indicates that there is an effort is being made to promote breastfeeding in the primary health care; however, it looks that breastfeeding education in the primary health care centres is not convincing enough to encourage mothers to breast-feed exclusively [54].

2.5. Beliefs and Attitudes about Breastfeeding

Recent surveys conducted by Al-Madani, Vydelingum [33], Alwelaie, Alsuhaibani [35], Amin, Hablas [30], and Mosalli, Abd [29] in different regions of Saudi Arabia reported that mothers have some misperceptions about breastfeeding Al-Madani, Vydelingum [33], and Alwelaie, Alsuhaibani [35] investigated women's' breastfeeding attitudes in more detail and found contradictory results. For example, Al-Madani, Vydelingum [33] found that 82% of women in eastern regions agreed or strongly agreed that formula is as healthy for infants as breast milk. On the other hand, Alwelaie, Alsuhaibani [35] found that 86% of women in the central region strongly disagreed or disagreed that formula is as good as breast milk. Although women in the Alwelaie, Alsuhaibani [35] study believed that formula was not as nutritionally valuable as breast milk, most mothers in the study planned to use or used mixed-feeding to feed their infants. The difference between results from these two studies could be due to different question structure. In a study by Al-Madani, Vydelingum [33] women apparently contradict themselves; 82% agreed that formula is as healthy for infants as breast milk and at the same time 95% agreed that breast-fed babies are healthier than formula-fed babies. It seemed that there was some confusion or that those mothers were holding two beliefs at the same time. The difference in attitudes also could be due to differences in the women's educational level. Which was seen by Al-Madani, Vydelingum [33] survey that included 38% of women who indicated their educational level was under high school, while the Alwelaie, Alsuhaibani [35] survey, which has more positive attitudes to breastfeeding, involved only 16% of women whose education was under high school. Further negative attitudes about breastfeeding found in Saudi surveys are: 1) 47% strongly agree or agree that formula is best for infant when mother returns to work; 2) 88% strongly agree or agree that formula feeding is more convenient than breastfeeding; 3) 83% agree or strongly agree that breastfed babies are more likely to be overfed than formula feed babies [33]; 4) 25% of women believed breastfeeding negatively affects mothers' breast shape [29]; 5) 41.7% of women believed that breastfeeding causes obesity; 6) 47% of women believe that breastfeeding causes "spoils"; and 7) 32.3% of women reported that fluids should be given to infants by 3 months of age [30]. Mosalli, Abd [29] study aimed to help understand problems associated with breastfeeding, so they could be addressed after initiating the BFHI. The study found that one-third of women lacked breastfeeding knowledge, women reported that formula feeding was easier than breastfeeding, women were not sure about producing sufficient milk supply for their infants, and women believed that breastfeeding would unpleasantly change breast shape. However, these surveys also showed positive attitudes about breastfeeding. Al-Madani, Vydelingum [33] and Alwelaie, Alsuhaibani [35] found that most of the women (75%- 90%) agreed and strongly agreed on breastfeeding benefits on health and wellness on both mothers and children. Overall,

this implies that mothers maybe knew that breast milk is better, but they perhaps did not know the risks associated with using the formula on infant health.

3. BREASTFEEDING PROMOTION

3.1. Baby-Friendly Hospital Initiative (BFHI)

The Baby-Friendly Hospital Initiative (BFHI) was launched in 1991 and by the WHO [55], and was revised in 2018. It is consists of ten steps which lead to successful breastfeeding;

Critical Management Procedures

1a. Comply fully with the *International Code of Marketing of Breast-milk Substitutes* and relevant World Health Assembly resolutions.

1b. Have a written infant feeding policy that is routinely communicated to staff and parents.

1c. Establish ongoing monitoring and data-management systems.

2. Ensure that staff have sufficient knowledge, competence and skills to support breastfeeding.

Key Clinical Practices

3. Discuss the importance and management of breastfeeding with pregnant women and their families.

4. Facilitate immediate and uninterrupted skin-to-skin contact and support mothers to initiate breastfeeding as soon as possible after birth.

5. Support mothers to initiate and maintain breastfeeding and manage common difficulties.

6. Do not provide breastfed newborns any food or fluids other than breast milk, unless medically indicated.

7. Enable mothers and their infants to remain together and to practise rooming-in 24 hours a day.

8. Support mothers to recognize and respond to their infants' cues for feeding.

9. Counsel mothers on the use and risks of feeding bottles, teats and pacifiers.

10. Coordinate discharge so that parents and their infants have timely access to ongoing support and care.

The initiative was found to be effective in the establishment of breastfeeding; therefore, many hospitals worldwide have adopted the BFHI. In Iowa hospital, it was reported that the implementation of more steps is associated with higher breastfeeding rates at discharge from hospitals [56]. Indeed, the implementation of the BFHI showed its effectiveness in promoting and encouraging breastfeeding initiation, duration, and exclusivity regardless of the differences in the implementation of the ten steps of the BFHI.

In Brazil, an observational study by Braun [57] reported that the BFHI has increased breastfeeding duration and exclusivity compared with non-BFHI with two months median duration of exclusive breastfeeding among BFHI (58%) participants compared to one-month median duration of exclusive breastfeeding among non-BFHI (30%) participants. A recent observational Brazilian study reported that babies born in BFHI hospital were 1.36 times more likely to breastfeed during the first hour postpartum and 1.47 times more likely to be exclusively breastfeeding at the first day after discharge from hospital. Also, the median duration of exclusive breastfeeding was significantly different between babies born in BFHI hospital at 60.2 days compared with 48.1 days among babies born in non-BFHI hospital [58]. The mean breastfeeding rate increased by 11.4% in BFHI hospital compared with 8% in the non-BFHI hospital between 1995 and 2002. In Italy, a controlled non-randomised study collected data in three phases (at discharge, three, and six months postpartum) in different regions of Italy [59]. Cattaneo and Buzzetti (2001) reported that the percentage of women who exclusively breastfeed at discharge from hospital increased after the BFHI from 41% to 77% in group 1 (southern Italy), and from 23% to 73% in group 2 (central and northern Italy). Full breastfeeding at three months was increased from 37% to 50% in group 1 and 40% to 59% in group 2, and at 6 months was increased from 43% to 62% in group 1 and 41% to 64% in group 2. Lastly, an observational study carried out in the United States (US) by recording feeding outcomes of infants born in hospital at three different years (1995, 1998, and 1999) after the implementation of the BFHI [60] reported that the implementation of BFHI has increased breastfeeding initiation rate and its exclusivity among the American population. It was found that breastfeeding initiation rates increased from 58% (1995) to 77.5% (1998) to 86.5% (1999) [60]. Furthermore, exclusive breastfeeding rates increased from 5.5% (1995) to 28.5% (1998) to 33.5% (1999) [60].

In Saudi Arabia, only one study has been published about the effectiveness of the BFHI on breastfeeding rates. The study compared the breastfeeding practice in subjects who delivered in BFHI hospital with others who delivered in non-BFHI hospitals in Riyadh, capital of Saudi Arabia [31]. The study concluded that education alone is not sufficient for sustainable breastfeeding, and there is a strong need to establish postnatal support network group including lactation consultant, peer-counselor working along with coordination between hospitals and outpatient clinic [39]. A recent cross-sectional study by Mosalli, Abd [29] investigated breastfeeding perceptions and attitudes in the International Medical Centre (IMC), Jeddah, Saudi Arabia prior to the implementation to the BFHI. Mosalli, Abd [29] found that the availability of free formula and the easy access for using it while in hospital after birth was reported as a reason for early introduction of formula. This may give the impression that there are no risks associated with formula as long as the hospital provided it. Mosalli, Abd [29] concluded that the findings of her study will provide guidance to correct women's misperceptions and negative attitudes mentioned above regarding breastfeeding reported in this study, and limit the access to the formula milk during postpartum hospitalization after implementing the BFHI.

3.2. The Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) was developed by Ajzen, (1985) an extension of the theory of reasoned action by Ajzen and Fishbein [61]. The TPB stated that the intention to do an action can be predicted accurately by attitudes toward the specific action, subjective norms, and perceived behavioural control and that intentions predict the actual behaviour [62]. Ajzen [62] defined the components of the TPB as following:

- Intentions defined as "intention to perform a given behaviour".
- Attitudes defined as "attitudes toward the behaviour".
- Subjective norm defined as "perceived social pressure to perform or not perform the behaviour".
- Perceived behavioural control defined as "the perceived ease or difficulty of performing the behaviour and is assumed to reflect past experience as well as anticipated impediment and obstacles".

The TPB was found to be an accurate and valid conceptual framework to predict human health-related behaviour [62, 63]. The TPB has been used as a conceptual framework and found to be valid in predicting the mother's behaviour toward breastfeeding [64], as well as initiation, duration, and continuation [65]. Bai, Middlestadt [66] in a prospective study in the US found that the attitudes and subjective norms are better predictors of intentions than the perceived behavioural control. However, there is a significant positive correlation between intentions and actual exclusive breastfeeding duration. In Scotland, 203 women were interviewed during postnatal hospitalisation and posted after 6 weeks postpartum. There was a significant relationship between women's feeding intention and behaviour ($p < 0.001$). Furthermore, the model was found to be a significant predictor of feeding practice ($p < 0.001$). It was found that subjective norms have a significant role in determining breastfeeding initiation and continuation. The views of the women's partner, parents, and midwife were fundamental for them. Discontinuation of breastfeeding was found to be associated with social pressure that favoured bottle-feeding [67]. However, a study by Wambach [7] used casual modelling to test the TPB ability to predict breastfeeding outcomes. One hundred thirty-five mothers in the last trimester were recruited using a convenience sampling procedure. Prenatal measurements were breastfeeding attitudes, intentions, subjective norms, and perceived behavioural control. The postnatal measurements were breastfeeding duration between four and six weeks postpartum, and breastfeeding problems. The results of the study found that attitudes and perceived behaviours were positively associated with breastfeeding duration. However, breastfeeding intentions were a weak predictor of breastfeeding duration. Indeed, the TPB has been used as a conceptual framework in many studies investigated about breastfeeding, and it was found valid and reliable.

4. FUTURE APPROACH

Recent research has been directed towards peer counselling and coaching sessions with near mothers to improving breastfeeding patterns through other experienced moms, which are called "Peer counsellors". It is confirmed in research that it is a

powerful tool, where mothers feel more comfortable sharing experience with other mothers who have the same ethnic and socioeconomic status, who have personal experience with breastfeeding and are trained to provide basic breastfeeding information and support to other mothers with whom they share various characteristics, such as language, race/ethnicity, to low socioeconomic. These mothers are selected to be trained in delivering support to other breastfeeding moms and also learn more information about breastfeeding. This method is an effective method, where it can be applied via phone or at home. Our future approach is to build peer consolers communities led by role models who can contribute to changing attitudes and behaviours to reach longer durations of breastfeeding and promote health and wellness.

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