



# Breastfeeding Education and the Role of Physical Therapy: A Cross-sectional Survey

Sattam M. Almutairi<sup>1\*</sup>, Raghad S. Aljutaily<sup>2</sup>, Raghad S. Alshuwayman<sup>2</sup>, Marzouq Almutairi<sup>1</sup>, Yousef M. Alshehre<sup>3</sup>

## Abstract

**Objectives:** This study aimed to assess the level of breastfeeding (BF) knowledge and the prevalence of musculoskeletal disorders associated with BF among mothers.

**Materials and Methods:** The participants were given a questionnaire containing 20 questions regarding their knowledge of BF practices and the prevalence of musculoskeletal disorders. The responses were reported as mean, standard deviation (SD), number (n), frequencies (f), and percentages (%).

**Results:** The study included 941 participants aged 18 to 49, with a median age of 31–35. Nearly half (47.9%; n = 451) of participants had no knowledge of the health advantages of BF. Furthermore, 82.6% (n = 777) of participants did not receive educational courses or information about childbirth during pregnancy or postnatal. Moreover, 42.7% (n = 402) reported BF-related musculoskeletal pain. The results showed that the least common information provided by doctors or other healthcare providers to mothers was that BF could reduce the risk of some types of cancer (13.6%; n = 128) and asthma and shortness of breath in children (14.1%; n = 133). The most common information was that breastfed children are at a lower risk of getting sick than formula-fed children (41.7%; n = 392).

**Conclusions:** The study showed a lack of knowledge regarding the benefits of BF and a high prevalence of musculoskeletal disorders among BF mothers in Saudi Arabia. We strongly recommend increasing the number of educational courses that provide knowledge and skills related to BF practices and appropriate positioning during BF.

**Keywords:** Breastfeeding, Mothers, Physical therapy modalities, Postpartum period

## Introduction

Breastfeeding (BF) is an essential aspect of postnatal care. It enhances mother and infant health in the short and long term (1,2). In particular, BF decreases the incidence of premenopausal breast cancer (3) and rates of ovarian and endometrial malignancies (4) in women, resulting in better maternal health (5). Women who breastfeed for a prolonged period have a lower risk of breast cancer (6), and BF is effective for birth control (2,7). Moreover, several benefits of BF have been linked to infant health. For instance, BF lowers the risk of chronic diseases, reduces the chance of neonatal complications, aids in developing motor and cognitive control, and improves the immune system (5).

Additionally, breastfed children are less likely to be obese or overweight and to develop type 2 diabetes, and BF reduces the risk of morbidity and mortality from infectious diseases (5). Breastfed children are less likely to develop allergies, asthma, botulism, diarrhea, ear infections, bacterial meningitis, urinary tract infections, cancer, bowel disease, liver disease, and sudden infant

death syndrome (2,5,7,8). In addition, the hospital admission rate and length of stay were lower in the breastfed infants (7).

Furthermore, recommendations regarding postnatal care practice state that healthy newborn infants should be placed skin-to-skin with their mothers with no separation (9). Several published datasets have revealed that the benefits of BF can be observed throughout the life cycle, in contrast to the popular misconception that BF is only beneficial during the infant stage (2,7,10). In addition to the benefits for mothers and their infants, BF has been associated with environmental and economic benefits (5).

The support and promotion of BF are global priorities. The World Health Organization (WHO) recommends BF for up to two years, with infants exclusively breastfed for the first six months (11). The term “exclusive BF” refers to the sixth-month period after birth, during which the baby consumes only breast milk (11). As a result, exclusive BF is critical for infants’ well-being and nutritional health (11). Despite the well-documented benefits of BF and WHO recommendations, poor BF practices have been

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<sup>1</sup>Physical Therapy Department, College of Medical Rehabilitation Science, Qassim University, Buraydah, Saudi Arabia 52571. <sup>2</sup>Physiotherapy Department, College of Medical Rehabilitation Science, Qassim University, Buraydah, Saudi Arabia 52571. <sup>3</sup>Physiotherapy Department, Faculty of Applied Medical Sciences, University of Tabuk, Tabuk, Saudi Arabia.

\*Corresponding Author: Sattam M. Almutairi, Email: A.Sattam@qu.edu.sa



## Key Messages

- ▶ Mothers should have sufficient information about the benefits of BF and the ideal positioning to avoid MSK pain.
- ▶ Healthcare professionals should be trained to provide proper guidance and support to mothers who choose to breastfeed.

documented globally, especially in developing countries, including Saudi Arabia (12). In particular, the BF rates in Saudi Arabia are below the recommended levels for promoting the health of mothers and infants. In addition, the exclusive BF target for the first six months of the baby's life has not yet been achieved (12). A previous review of BF in several Saudi Arabian cities has documented that the mean duration of BF has shown a progressive decline since 1985 (13). The literature also showed that only 37.5% of Saudi mothers continued exclusive BF six months after birth, 31.9% breastfed for 9 to 12 months, and only 23% for 18 to 24 months (12). Health education has been reported to improve BF practices of mothers. Recent studies in Saudi Arabia have suggested that BF education and proper positioning are vital to correct mothers' misunderstandings about BF (14,15).

In addition to BF education, many studies have aimed to identify factors that hinder BF practices. Recent studies have documented that the pain associated with BF is one of the barriers to meeting the desired BF duration (16,17). Improper positioning during BF can lead to musculoskeletal (MSK) disorders (18,19). BF mothers experience breast (20), neck, upper trunk, shoulder (10, 21), elbow (10), and lower trunk pain (22). MSK pain could prevent mothers from reaching their BF goals and potentially lead to the cessation of BF (16,17). As part of a healthcare provider, physical therapists can assess and treat MSK impairments that may result from improper BF positioning (18,20,23,24). A retrospective study reported that physical therapists provide a variety of treatments to BF mothers, which may include but are not limited to hot or cold compresses (25), therapeutic ultrasound (26), postural education and advice, therapeutic massage (27), Kinesio tape, and laser (28) and thermal therapy (27).

As recommended, obstetric physical therapists specializing in women's health should be available in public and private hospitals to educate women regarding the importance of BF and aspects such as proper positioning (18,24,29). Physical therapists can assist mothers and infants with successful BF practices and postnatal care (18,24,29). Prenatal and postnatal classes on proper attachment and positioning during BF help reduce MSK stress and promote the continuation of BF (18,23). Ergonomic interventions for mothers during BF are recommended to relieve strain on the neck, upper back, lower back, and shoulders (30). Physical therapists can recommend an ergonomically designed chair (31), comfortable pillow (32), supportive bra (33), and forearm

support to prevent MSK pain. Stretching exercises are also recommended during BF practice, particularly for the neck, shoulder, and scapular muscles. In addition, strengthening exercises can be performed on the scapular retractor muscles (23). Furthermore, physical therapists can use promotor exercises to stimulate sucking and swallowing in neonatal infants (34). Several studies have revealed that physical therapy is critical in BF practice and postnatal care (18,23,29,35).

Therefore, it is necessary to consider BF practices based on mothers' perceptions in Saudi Arabia and the prevalence of MSK disorders among Saudi Arabian mothers. Thus, the primary aim of this study was to assess the level of knowledge about BF among Saudi Arabian mothers, and the secondary aim was to assess the prevalence of MSK disorders associated with BF.

## Materials and Methods

### Study Design

This study used a cross-sectional, open survey. The Institutional Review Board at the Ministry of Health, Buraydah, Saudi Arabia, has ethically approved this study (reference number: 1443-225277). All participants provided informed consent before starting the survey. In particular, the beginning of the survey had a consent section, and all participants had time to read the informed consent prior to completing the survey. Acceptance to complete the survey was interpreted as informed consent to participate in this research.

### Participants

This study used a convenience sampling method. The participants included mothers aged 18-49, as the WHO specifies 49 years as the maximum age for childbearing (36). The study included Saudi and Arabic-speaking mothers who had recently given birth. Participation in the study was voluntary. The survey was distributed between January and May 2022 on social media and applications (Twitter and WhatsApp). The recruitment message, which described the objectives of the study and included a link to a 10-minute survey, was disseminated through social media. The participants were informed that no identifiable information would be released or published, and confidentiality was assured. The participants were assured that any information provided would be used only for research purposes. All participants agreed to participate before the start of the study.

### Questionnaire

The researchers developed a questionnaire based on a thorough literature review. This self-administered online questionnaire had two parts: demographic data and 20 questions related to knowledge of BF practices and the prevalence of MSK disorders. Demographic data included age, height, weight, nationality, employment status, childbirth (vaginal or cesarean), educational level, medical

comorbidities, current city of residence, marital status, smoking status, annual income, and type of hospital. The second part, which consisted of 20 questions, was subdivided into two sections. The first section assessed the reasons that prevented mothers from BF, the benefits of BF, educational courses during pregnancy or postpartum, and MSK disorders related to BF practice. The typed answers were categorized and summarized.

In the second section, the questionnaire was followed up with 14 specific questions regarding whether doctors or other healthcare providers had informed BF mothers about the benefits of BF for infants and mothers and proper BF positioning. The 14 questions were closed-ended with response options (“Yes,” “No,” “I am not sure,” and “I knew this information”). The questionnaire was piloted with a sample of eligible BF mothers (n = 15) to test the questionnaire design, gain feedback on the survey language and usability, and make any necessary changes. After feedback, minor alterations were made to ensure the questions were clearly understood and the required information was collected. The questionnaire contained a consent section and details on contacting the authors for further information.

### Data Analysis

The collected data were analyzed using IBM Statistical Package for Social Science software (SPSS) (version 28, SPSS Inc., Chicago, Illinois, USA). Only the participants who completed the survey were included in the analysis. Demographic characteristics and participants’ responses were reported as mean, standard deviation (SD), number (n), frequencies (f), and percentages (%). For the 14 questions, the average percentage for each answer was obtained by adding up the percentages and dividing by 14. For questions on income range, height, weight, residential region, and employment, several respondents entered “Not applicable” (N/A) because they preferred not to provide information or because they entered incorrect values.

## Results

### Survey Responses

In total, 1188 female participants responded to the survey. Out of 1188 participants, 247 were excluded because they did not meet the eligibility criteria (156 did not give birth, 43 were non-Saudi citizens, and 48 were older than 49). Thus, 941 eligible participants were included in the analysis.

### Demographics and Descriptive Statistics

The participants aged 18 to 49, with a median age of 31-35 (22.7%; n = 214). The mean and standard deviation (SD) of the height and weight were 155.76 cm ± 16.5 and 69.8 kg ± 15.2, respectively. The results indicated that 44.2% of participants (n = 416) were homemakers, and 99.5% (n = 936) were nonsmokers. Most participants were married

(96.2%; n = 905), and more than half (60%; n = 565) had a bachelor’s degree. Approximately 33.9% (n = 319) of the participants reported an annual income of less than 48 000 Saudi riyals. The majority of the participants (72.8%; n = 685) were from the middle region. The most common comorbidity was asthma, with a prevalence of 5.6% (n = 54). Other selected characteristics of the participants are shown in Table 1.

**Table 1.** Participants’ Demographic Characteristics (n = 941)

Demographic Characteristics	No. (%)	
Age group (y)	18-25	72 (7.7%)
	26-30	206 (21.9%)
	31-35	214 (22.7%)
	36-40	184 (19.6%)
	41-45	141 (15%)
	46-49	124 (13.2%)
Height (cm)	(n = 924) M ± SD	155.76 ± 16.5
	N/A (n = 17)	
Weight (kg)	(n = 929) M ± SD	69.8 ± 15.2
	N/A (n = 12)	
Marital status	Married	905 (96.2%)
	Divorced	20 (2.1%)
	Widower	16 (1.7%)
Educational level	Doctorate	10 (1.1%)
	Master	27 (2.9%)
	Bachelor	565 (60%)
	Diploma	129 (13.7%)
	High school	150 (15.9%)
	Middle school	40 (4.3%)
	Elementary school	17 (1.8%)
Not educated	3 (0.3%)	
Chronic conditions	Asthma	54 (5.6%)
	Diabetes mellitus	37 (3.8%)
	High blood pressure	35 (3.6%)
	Cholesterol	32 (3.3%)
	Heart disease	7 (0.7%)
	Arthritis	13 (1.34%)
	Osteoporosis	11 (1.13%)
	Cancer	6 (0.6%)
	Thyroid disease	23 (2.4%)
	Other	21 (2.2%)
	Annual income (SR)	<48000
48000-71999		218 (23.2%)
72000-95999		106 (11.3%)
96000-1119999		97 (10.3%)
>120000		152 (16.2%)
N/A		49 (5.1%)
Residential regions	Middle	685 (72.8%)
	Northern	47 (5%)
	Southern	26 (2.8%)
	Eastern	101 (10.7%)
	Western	76 (8.1%)
	N/A	6 (0.6%)
Type of hospitals	Governmental	538 (61.63%)
	Private	335 (38.37%)
Smoking	Yes	5 (0.5%)
	No	936 (99.5%)
Employment	Housewife	416 (44.2%)
	Full time	231 (24.5%)
	Not working and looking for job	161 (17.1%)
	Retired	50 (5.3%)
	Student	41 (4.4%)
	Part time	39 (4.1%)
N/A	3 (0.3%)	
Family members	M ± SD	5.5 ± 2
Childbirth	Vaginal	619 (65.8%)
	Cesarean	322 (34.2%)

SR = Saudi riyals; N/A = Not applicable; M = mean; SD = standard deviation.

### Knowledge of the Importance of Practicing BF and the Prevalence of MSK Disorders

The majority of participants (95.7%; n = 901) stated that no medical reason prevented them from practicing BF. Nevertheless, several reasons have been reported to prevent mothers from practicing BF are summarized in (Figure 1). Additionally, the results showed that 47.9% (n = 451) of the participants reported that they did not receive information about the benefits of BF from doctors or healthcare providers, 32.4% (n = 305) reported that they received information, and 19.7% (n = 185) reported that they were not sure. However, several BF benefits (Figures 2 and 3) for infants and mothers have been identified from the mother's viewpoint. Furthermore, 82.6% (n = 777) of participants did not receive any educational courses or information about childbirth during pregnancy or postnatal. Moreover, 42.7% (n = 402) of the participants reported MSK pain caused by BF.

For the 14 questions, the average and standard deviation of the percentage of the four responses showed that participants responded "Yes" (26.3%;  $\pm 10.8$ ), "No" (47.9%;  $\pm 17.1$ ), "Not sure" (7.7%;  $\pm 2.3$ ), and "I knew this information" (17.9%;  $\pm 9.4$ ). The results indicated that the least common information provided by doctors or other healthcare providers to mothers was that BF could

reduce the risk of some types of cancer (13.6%; n = 128) and asthma and shortness of breath (14.1%; n = 133) in children. The most common information provided by doctors or other healthcare providers to mothers was that breastfed children were at a lower risk of getting sick than formula-fed children (41.7%; n = 392). The most commonly known information of which mothers were already aware was that BF works as birth control (39.2%; n = 373). The mothers were least likely to already know that the baby should stay with the mother in the same room after delivery (9.2%; n = 87). Further details are provided in Table 2.

### Discussion

This study aimed to assess knowledge of the importance of BF practice and the prevalence of MSK disorders associated with BF among Saudi Arabian mothers using an Arabic version of an electronic self-administered questionnaire. This cross-sectional study surveyed 941 BF Saudi Arabian mothers, 47.9% of whom reported not receiving any information from doctors or other healthcare providers about the benefits of BF practice during pregnancy or postpartum, thus limiting infants' exposure to the benefits of BF. This study further found that 82.6% of the respondents reported not attending any

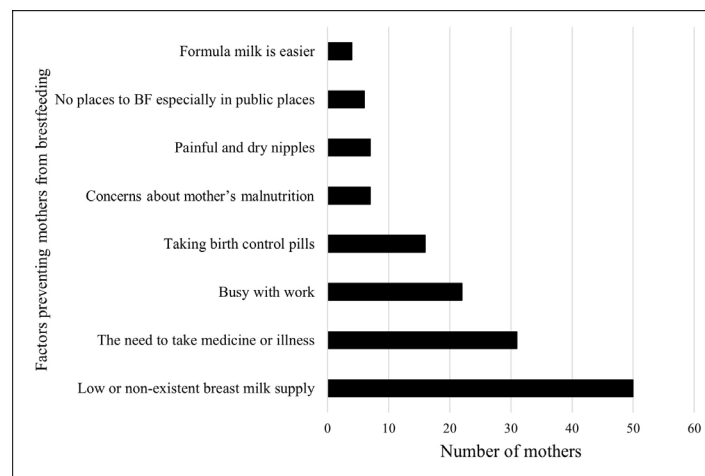


Figure 1. Factors Preventing Mothers From Practicing Breastfeeding.

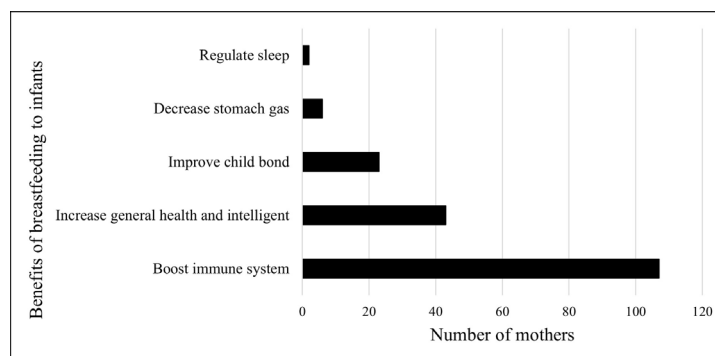


Figure 2. Mothers' Perspective of Breastfeeding Benefits to the Infant.

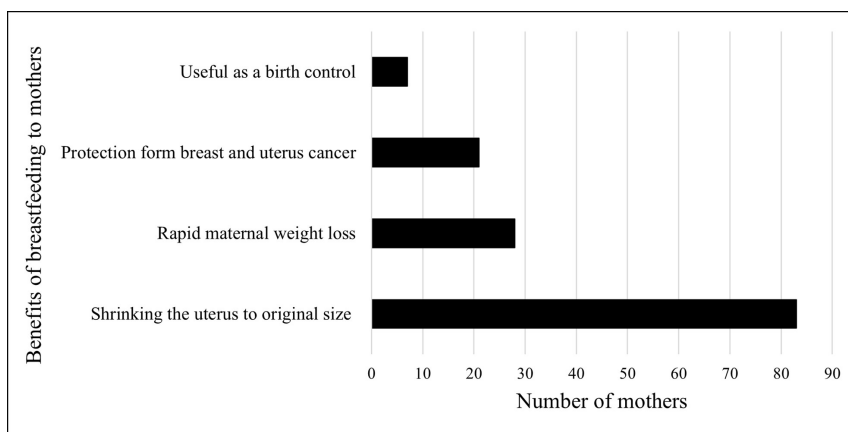


Figure 3. Mothers' Perspective of Breastfeeding Benefits to the Mother.

classes or educational courses related to childbirth and care during or after pregnancy. Our findings confirm the lack of education regarding the importance of BF among Saudi Arabian mothers. Prior studies in Saudi Arabia reported that Saudi Arabian mothers lack BF education and information, and the rate of BF continuation to one year has declined to 1.8% (14,15). BF behavior is influenced by knowledge of the benefits associated with BF practice (37). Not attending prenatal training sessions was found to be one of the factors contributing to BF discontinuation (38).

In the present study, the prevalence of MSK pain associated with BF was high (42.7%). In a previous study, 29.3% of the mothers stopped BF during the first month because of MSK pain (17). Consequently, MSK pain could prevent BF mothers from reaching their BF goals (16). In this regard, physical therapists can assess and treat MSK pain in BF mothers (23,25,27,28). Furthermore, physical

therapists can teach proper positions (18) and provide ergonomic interventions during the BF period to avoid MSK pain (30,32,33). The results of this study showed that 389 (41.3%) respondents did not receive any education about appropriate BF positions. A literature review of medical research on BF practices reported that painful BF associated with incorrect infant positioning was one factors in discontinuing BF (18,19). This discourages sustained BF practice. Physical therapists, doctors, nurses, midwives, and lactation support providers can help mothers meet their desired BF duration, alleviating the substantial impact on mental and physical health (2,25).

This study further investigated the obstacles and benefits of BF from the mothers' perspectives. The study respondents reported obstacles that prevented them from practicing BF. Most respondents provided the following answers: perceived low or nonexistent breast milk supply; being busy with work; the need to take

Table 2. Knowledge of the Importance of Practicing BF and Proper Positioning

Items	Yes n (%)	No n (%)	Not sure n (%)	I knew this information n (%)
Diabetes for child	141 (15%)	578 (61.4%)	106 (11.3%)	116 (12.3%)
Cancer for child	128 (13.6%)	616 (65.5%)	105 (11.2%)	92 (9.8%)
Ear infection in child	144 (15.3%)	615 (65.4%)	84 (8.9%)	98 (10.4%)
Allergy in child	176 (18.7%)	570 (60.6%)	89 (9.5%)	106 (11.3%)
Asthma and shortness of breath in child	133 (14.1%)	636 (67.6%)	87 (9.2%)	85 (9%)
Hospital admission and stay for child	236 (25.1%)	474 (50.4%)	96 (10.2%)	135 (14.3%)
Getting sick in comparison to formula fed child	392 (41.7%)	237 (25.2%)	44 (4.7%)	268 (28.5%)
Child immune system	355 (37.7%)	260 (27.6%)	69 (7.3%)	257 (27.3%)
Mother uterus cancer	313 (33.3%)	331 (35.2%)	69 (7.3%)	228 (24.2%)
Mother breast cancer	310 (32.9%)	317 (33.7%)	68 (7.2%)	246 (26.1%)
Birth control	373 (39.6%)	161 (17.1%)	38 (4%)	369 (39.2%)
Skin-to-skin	160 (17%)	566 (60.1%)	51 (5.4%)	164 (17.4%)
Keeping child in mother's room	237 (25.2%)	561 (59.6%)	56 (6%)	87 (9.2%)
Breastfeeding positions	380 (40.4%)	389 (41.3%)	58 (6.2%)	114 (12.1%)
Total (Mean ± SD)	26.3% (±10.8)	47.9% (± 17.1)	7.7% (± 2.3)	17.9% (± 9.4)

medicine for illness; MSK pain and dry nipples; no places to breastfeed, especially in public places; formula milk is easier; concerns about the mother's malnutrition; and taking birth control pills (Figure 1). Two key themes were identified collaboratively regarding the benefits of BF. The respondents' answers were divided into two categories. The first category was about the benefits of BF for infants, such as boosting the immune system, increasing general health and intelligence, decreasing stomach gases, improving mother-child bonds, and regulating sleep (Figure 2). The second category was about the benefits for the mothers, including rapid maternal weight loss, protection from breast and uterine cancer, usefulness as birth control, and helping to shrink the uterus to its original size (Figure 3). The results of this study are consistent with those of other studies (12,14,16,17,20,38).

These factors may influence BF and create significant barriers to BF practices, affecting BF duration and obstructing the health and wellness of mothers and their infants. This issue raises the need to promote BF by implementing policies and conducting educational courses. Social acceptance and awareness of BF can be supported through peer counseling and by allocating comfortable private rooms in public, especially at hospitals, malls, airports, workplaces, and other facilities (39).

An interesting finding from this study was that doctors or other healthcare providers least likely informed mothers that BF can reduce the risk of cancer, asthma, and shortness of breath in breastfed infants. In contrast, they most likely informed mothers that breastfed children are at a lower risk of getting sick compared to formula-fed children and that BF positioning is appropriate. Moreover, the information mothers most often already knew was that BF works as a birth control that reduces the incidence of pregnancy. More than half (60%) of the respondents in this study had a bachelor's degree; however, the disparity in the level of maternal knowledge and education regarding the benefits of BF was uncovered. This study proposes the necessity of promoting BF and expanding awareness of its benefits by healthcare providers during prenatal, postnatal, and scheduled immunizations. In addition, doctors and other healthcare providers should inform mothers about the numerous benefits of BF and, conversely, the quantifiable risks associated with formula feeding (2).

Healthcare personnel support for BF is urgently needed in maternity, prenatal, and postnatal facilities. For instance, classes for mothers presented by healthcare providers, prenatal schools for pregnant women, videos made by hospitals, professional BF books/booklets that cover the benefits of BF, the proper frequency of BF, the recommended duration, and appropriate mother and infant positioning. One study showed that mothers who received proper maternal education were four times more likely to practice BF than their counterparts (40). In 2016,

the World Breastfeeding Trends Initiative (WBTi) in Saudi Arabia recommended expanding awareness of the benefits of BF to include a larger sample of the community through social centers, inclusion into the curricula of high schools and universities, emphasis during antenatal visits, and social media channels (39).

This study had a few limitations that should be considered. First, it was conducted electronically and was specific to Saudi Arabian mothers. Therefore, using a convenient sample and social desirability may limit the generalizability of the results. Second, the cross-sectional research design is also limited by potential recall bias since the accuracy of the data collected relies on the mother's memory, and some BF mothers may have difficulty remembering. The other limitation of this study is the lack of data on psychosocial factors, social support, and the effects of MSK disorders and BF positioning, which might also significantly contribute to the knowledge and skills related to BF practice and can be included in future research.

## Conclusions

This study showed that Saudi mothers lack knowledge of the benefits of BF and have a high prevalence of MSK disorders among BF mothers. We strongly recommend increasing educational courses that provide knowledge and skills related to the practice of BF for mothers and their families, community members, and relevant healthcare providers, including doctors, nurses, physical therapists, and individuals who create and implement policies with BF mothers. Further studies are warranted to address the association between BF practices and other important factors, such as MSK pain.

## Authors' Contribution

**Conceptualization:** Sattam M. Almutairi, Yousef M. Alshehre, and Marzouq Almutairi.

**Data curation:** Raghad S. Aljutaily and Raghad S. Alshuwayman.

**Formal analysis:** Sattam M. Almutairi, Yousef M. Alshehre, and Marzouq Almutairi.

**Investigation:** Raghad S. Aljutaily and Raghad S. Alshuwayman.

**Methodology:** Sattam M. Almutairi, Yousef M. Alshehre, and Marzouq Almutairi.

**Supervision:** Sattam M. Almutairi, Yousef M. Alshehre, and Marzouq Almutairi.

**Validation:** Sattam M. Almutairi, Yousef M. Alshehre, and Marzouq Almutairi.

**Writing—original draft:** Sattam M. Almutairi, Yousef M. Alshehre, and Marzouq Almutairi.

**Writing—review & editing:** Sattam M. Almutairi, Yousef M. Alshehre, and Marzouq Almutairi, Raghad S. Aljutaily and Raghad S. Alshuwayman.

## Conflict of Interests

The authors declare that they have no competing interests.

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