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**Work-related Influences on Knowledge and Practice of Exclusive  
Breastfeeding among Postnatal Mothers**

**Hasni Embong<sup>1\*</sup>, Nur Hanim Natasha Mohd Rosdi<sup>1</sup>, Norhasmah Mohd Zain<sup>1</sup>, Rusnani Ab Latif<sup>2</sup>**

*\*Corresponding Author*

<sup>1</sup> School of Health Sciences, Universiti Sains Malaysia, Health Campus, 16150, Kubang Kerian, Kota Bharu, Kelantan. Malaysia

<sup>2</sup> Faculty of Health Sciences, Universiti Teknologi MARA, Pulau Pinang Branch, Campus Bertam, 13200, Kepala Batas, Pulau Pinang. Malaysia

ehasni@usm.my, hasmahmz@usm.my, hnmtasha@gmail.com, rusnani@uitm.edu.my  
Tel: 0139267679

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**Abstract**

This study examines the knowledge and practices of exclusive breastfeeding (EBF) and their relationship with work-related factors among 152 working mothers at Hospital Pakar Universiti Sains Malaysia (HPUSM). Conducted in September 2023 using a self-administered questionnaire, findings showed 75.7% had excellent EBF knowledge and 59.9% had excellent practice. No significant associations were found between EBF practice and work hours, maternity leave, or the use of private rooms. However, refrigerator availability was significantly linked to better EBF practice. The study highlights the need for improved workplace support, including lactation facilities and education on milk handling, to enhance breastfeeding among working mothers.

**Keywords:** Knowledge; Practice; Exclusive Breastfeeding; Postnatal mothers

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**1.0 Introduction**

Exclusive breastfeeding (EBF) for the first six months is the recommended standard for infant nutrition, promoting growth, immunity, and protection against infections (WHO, 2023; Alayon et al, 2022). Despite its benefits, global EBF rates remain below targets, especially among working mothers facing practical challenges. In Malaysia, initiatives like the Baby-Friendly Hospital Initiative, the National Breastfeeding Policy, and community support programs aim to improve breastfeeding practices, yet national EBF rates remain suboptimal. Work-related support and facilities for milk expression and storage are critical for sustaining EBF (Ahmad et al, 2022). The Health Belief Model (HBM) is used to understand and guide working mothers' exclusive breastfeeding practices by addressing their health beliefs and knowledge (Emmanuel, 2015). This study aimed to assess the knowledge and practice of exclusive breastfeeding among postnatal mothers and to examine the influence of work-related factors on these outcomes. This will identify gaps and inform

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policies that promote supportive work environments and effective breastfeeding interventions. The findings will contribute to developing targeted strategies to enhance maternal and child health outcomes in Malaysia and similar settings.

## 2.0 Literature Review

### 2.1 Knowledge of Exclusive Breastfeeding

Maternal knowledge significantly influences the initiation and continuation of exclusive breastfeeding (EBF). While awareness of EBF benefits is generally high, external factors, especially workplace challenges, can hinder its practice. Studies in Malaysia (Muda et al., 2022; Shohaimi et al., 2022) indicate high knowledge levels among mothers, particularly in Baby-Friendly Hospital Initiative (BFHI) facilities. Internationally, research in Nigeria and Namibia (Kayode et al., 2023; Nikanor et al., 2024) also shows strong EBF knowledge linked to education, yet practical difficulties such as poor attachment and technique continue to affect successful implementation (Wee & Rosli, 2023).

### 2.2 Practice of Exclusive Breastfeeding

Although the level of awareness regarding exclusive breastfeeding (EBF) is high, its practice remains insufficient. Hashim et al. (2020) reported that nearly all healthcare workers in Malaysia had stopped breastfeeding before six months. Among working mothers in Selangor, more than half had ceased breastfeeding within three months postpartum. Sabo et al. (2023) reported that only 26.8% of respondents practised EBF, and 69.5% stated that an early return to work was the main barrier to continuing EBF (Al-Katufi et al., 2020). While 58% of working mothers in Zambia practice EBF (Mwiza et al., 2023) and the majority of the respondents' practice of EBF was minimal (Sabo et al., 2023). EBF rates among working mothers also remain low; for instance, only 34.2% in North-Western Nigeria (Adamu et al., 2022) and 38.5% in Tanzania (Mkono et al., 2024), far below the WHO's target of 50% exclusively breastfed during the first six months of life by 2025.

### 2.3 Association Between Work-related Factors and Exclusive Breastfeeding Practice

Employment is a significant barrier to EBF. Maternal job status, education, parity, and workplace environment significantly affect EBF adherence (Mekebo et al., 2022; Sultana et al., 2022). Working mothers often lack access to supportive facilities such as private lactation rooms and sufficient maternity leave. Al-Katufi et al (2020) found that working environments in the field of primary health care did not contain suitable places to breastfeed or pump breast milk, no facilities for the storage of milk expressed during working hours and the existence of a strict work schedule within the work environment are the major work-related barriers to continuity of EBF. Supportive workplace policies and a conducive environmental setting play a crucial role in sustaining exclusive breastfeeding (EBF) practices among working mothers.

## 3.0 Methodology

### 3.1 Study Design

This cross-sectional study was conducted at Hospital Pakar Universiti Sains Malaysia (HPUSM) from February to March 2023. The researchers selected HPUSM for its Baby-Friendly Hospital Initiative (BFHI) status, wide catchment area, and large patient capacity.

### 3.2 Study Population and Sampling

The target population included working mothers delivered at HPUSM within the last six months. Inclusion criteria were mothers with infants aged at least six months, employed (permanent or temporary), and able to communicate in Malay or English were recruited after giving consent. Exclusion criteria included mothers with a history of preterm delivery, congenital anomalies in the infant, intellectual disabilities, HIV, or no mobile phone access. The researcher employed a purposive sampling method and determined the sample size ( $n = 299$ ) based on three study objectives, utilising single and two-proportion formulas. The calculation was guided by previous studies by Chhetri et al. (2018) and Ibrahim and Abdul Hamid (2019). The largest calculated sample size was selected to ensure adequate statistical power and account for potential non-response.

### 3.3 Data Collection

A structured self-administered questionnaire was distributed via Google Forms through WhatsApp, following informed written consent obtained electronically. The researchers first contacted participants via phone using data from the hospital's Medical Record Unit. They included only eligible and consenting mothers in the study. The questionnaire had three main components: first, socio-demographic and work-related factors covering race, education, employment status, and workplace support (4 items). Second, knowledge of EBF, adapted from Ahmad (2023), included 41 Yes/No questions covering various domains: benefits for babies and mothers, colostrum, breastfeeding effectiveness, milk expression, duration, problems, and general practices. The practice of EBF was assessed via 11 items using Yes/No and a 4-point Likert scale, focusing on breastfeeding and formula-feeding behaviours.

### 3.4 Data Analysis

Data was entered, cleaned, and analysed using SPSS version 24.0. The researchers used descriptive statistics (frequencies and percentages) to summarise socio-demographic data, knowledge, and practices. The knowledge of participants was assessed using a structured scoring system based on the correctness of responses to each item. For positive statements, a correct answer was awarded one mark, while an incorrect answer received zero marks. Conversely, for negative statements, an incorrect answer was given one mark and a correct answer received zero marks. The total possible score ranged from 0 to 41 marks, with 41 marks representing 100%. Participants' overall knowledge levels were categorised as excellent (75–100%), average (50–74%), weak (25–49%), or poor (0–24%). The level of practice among respondents was assessed using a structured scoring system based on their responses to the practice items. For items 3 and 8, which consisted of positive and negative statements, a “Yes” response for a positive statement and a “No” response for a negative statement were awarded one mark, while alternative responses received zero marks. For items 4, 5, 6, 7, 9, 10, and 11, a frequency-based scoring system was applied, with positive statements scored from 1 (never practised) to 4 (practised at all times) and negative statements scored inversely. Excluding general items, the total possible score ranged from 7 to 28 marks, with 28 marks representing 100%. Participants' practice levels were categorised as excellent (75–100%), average (50–74%), weak (25–49%), or poor (0–24%). The researchers used the Chi-square test to determine associations between work-related factors and EBF practice, considering  $p < 0.05$  statistically significant to address the third objective.

### 3.5 Ethical Considerations

The Human Research Ethics Committee (HREC) approved the study, and the Director of HPUSM granted permission. The researchers ensured voluntary participation and maintained confidentiality throughout the study. The researcher included only fully completed questionnaires in the final analysis.

## 4.0 Findings

The study achieved a 100% response rate. The majority of respondents were Malay (89.5%). Just over half of the participants (53.3%) had educational qualifications above diploma level. Most were employed in either the government sector (46.1%) or the private sector (42.1%), with 94.7% working full-time. However, 63.2% reported the absence of a private room at their workplace for expressing breast milk, although 64.5% had access to a refrigerator for milk storage. Additionally, a significant proportion (85.5%) had maternity leave longer than 60 days. Table 1 summarises further participant characteristics.

Table 1. Socio-demographic characteristics of mothers in HPUSM (n = 152)

Characteristics	n	(%)
<b>Race</b>		
Malay	136	89.5
Chinese	11	7.2
Indian	5	3.3
Others	0	0.0
<b>Educational status</b>		
≤ Diploma	71	46.7
> Diploma	81	53.3
<b>Types of employment</b>		
Self-employment	18	11.8
Private sector	64	42.1
Government sector	70	46.1
<b>WORK-RELATED FACTORS</b>		
<b>Working hours</b>		
Full time	144	94.7
Part time	8	5.3
<b>Workplace has private room for milk expression</b>		
Yes	56	36.8
No	96	63.2
<b>Workplace has refrigerator for milk storage</b>		
Yes	98	64.5
No	54	35.5
<b>Maternity leave period</b>		
≤ 60 days	22	14.5
> 60 days	130	85.5

The majority of participants exhibited an excellent level of knowledge (75.7%), followed by good (21.1%) and moderate (3.3%) levels. None of the participants fell into the poor knowledge category (Table 2).

Table 2. Knowledge level on exclusive breastfeeding among mothers (n = 152)

Level of Knowledge	Frequency (n)	Percentage (%)
Moderate	5	3.3
Good	32	21.1
Excellent	115	75.7

Table 3 presents a detailed breakdown of responses to each item assessing knowledge of exclusive breastfeeding (EBF). More than 80% of mothers answered accurately on topics such as breastfeeding's role in reducing infections, promoting brain development, aiding uterine contraction, and the importance and characteristics of colostrum. They also demonstrated strong knowledge of recommended breastfeeding duration, initiation within 30 minutes after birth, on-demand feeding, and proper positioning. However, notable gaps persisted in several areas, particularly misconceptions about breastfeeding and breast cancer risk (only 34.2% correct), the safety of mixed feeding in the first six months, and proper handling and storage of expressed breast milk. Misunderstandings were also evident regarding breastfeeding during nipple problems, jaundice, and engorgement. Overall, while the respondents exhibited good foundational knowledge of breastfeeding, targeted education is still needed to address specific misconceptions and improve safe breastfeeding practices.

Table 3. Distribution of Respondents' Knowledge on Breastfeeding by Item (N = 152)

Statement	Correct (%)	Wrong (%)
Breastfeeding reduces the risk of lung infections in infants	94.7	5.3
Breastfeeding causes infants to experience diarrhea easily	90.8	9.2
Breastfeeding increases infant brain development	94.1	5.9
Breastfeeding reduces the incidence of child abuse	84.2	15.8
Exclusive breastfeeding can help with child spacing	85.5	14.5
Breastfeeding mothers return to pre-pregnancy weight faster	91.4	8.6
Breastfeeding helps the uterus to contract	91.4	8.6
Breastfeeding mothers are at risk of breast cancer	34.2	65.8
Breastfeeding promotes bone decay	76.3	23.7
Colostrum causes infant constipation	83.6	16.4
Colostrum is the thick, sticky, yellowish early milk	94.7	5.3
Colostrum is hard to digest and should be discarded	88.2	11.8
Colostrum cannot protect infants from jaundice	84.2	15.8
Breastfeeding should begin within 30 minutes after birth	84.9	15.1
Exclusive breastfeeding should be done for 6 months	86.2	13.8
Complementary feeding should begin at 6 months	95.4	4.6
Formula milk can be given alongside breastfeeding in the first 6 months	47.4	52.6
Breastfeeding should continue until age 2, even with complementary feeding	91.4	8.6
Mixed feeding (breast + formula) is acceptable after complementary feeding begins	80.3	19.7
Breastfeeding should be done on demand	87.5	12.5
Complementary feeding should begin at 6 months	95.4	4.6
Formula milk can be given alongside breastfeeding in the first 6 months	47.4	52.6
Breastfeeding should continue until age 2, even with complementary feeding	91.4	8.6
Mixed feeding (breast + formula) is acceptable after complementary feeding begins	80.3	19.7
Breastfeeding should be done on demand	87.5	12.5
Frequent breastfeeding helps prevent engorgement	90.1	9.9
Formula milk protects against allergies better than breast milk	75.0	25.0
Giving plain water after breastfeeding is encouraged	72.4	27.6
Breastfeeding should stop if baby has jaundice	78.3	21.7
Babies sleep better when adequately breastfed	93.4	6.6
Baby's weight increases healthily with proper breastfeeding	95.4	4.6
Proper breastfeeding position enhances effectiveness	97.4	2.6
Breast size affects breast milk production	81.6	18.4
Adequately breastfed babies urinate more frequently	90.8	9.2
Breast milk should be expressed every 3 hours if separated from baby	89.5	10.5
Expressed milk can be heated over direct flame	71.7	28.3
Used expressed milk can be re-stored	67.1	32.9
Expressed milk can be stored 3–5 days in refrigerator (chiller)	75.7	24.3
Expressed milk can be stored up to 3 months in freezer of a two-door refrigerator	90.8	9.2
Expressed milk can be heated in a microwave	60.5	39.5
Mothers with inverted nipples cannot breastfeed	63.2	36.8
Breastfeeding must stop if mother has cracked nipples	52.6	47.4
Engorgement can be relieved with cold compress	74.3	25.7
Cabbage leaves help reduce breast engorgement	74.3	25.7
Breast massage can reduce engorgement	92.1	7.9
Breastfeeding must stop if mother has breast engorgement	52.6	47.4

59.9% of mothers demonstrated excellent exclusive breastfeeding practice, while the remaining 40.1% showed good practice. None of the participants were classified under the moderate or poor practice categories (Table 4).

Table 4. Level of Practice on Exclusive Breastfeeding Among Respondents (N = 152)

Level of Practice	Frequency (n)	Percentage (%)
Good	61	40.1
Excellent	91	59.9

Table 5 outlines the relationship between work-related factors and exclusive breastfeeding (EBF) practice levels. The analysis revealed no statistically significant associations between EBF practice and working hours ( $p = 0.559$ ), availability of private rooms for milk expression ( $p = 0.233$ ), or duration of maternity leave ( $p = 0.697$ ). However, the availability of a refrigerator for milk storage at the workplace was significantly associated with higher levels of EBF practice ( $p = 0.011$ ).

Table 5. Association Between Work-Related Factors and the Level of Exclusive Breastfeeding Practice (N=152)

Variables	Level of Exclusive Breastfeeding (EBF) Practice		X <sup>2</sup>	P-value
	Good	Excellent		
<b>Working hours</b>			0.342	0.559
Full-time	57 (93.4%)	87 (95.6)		
Part-time	4 (6.6%)	4 (4.4)		
<b>Private room to express breastmilk</b>			1.420	0.233
Yes	19 (31.1%)	37 (40.7)		
No	42 (68.9%)	54 (59.3)		
<b>Refrigerator to store milk</b>			6.421	0.011
Yes	32 (52.5%)	66 (72.5)		
No	29 (47.5%)	54 (35.5)		
<b>Maternity leave period</b>			0.152	0.697
≤60 days	8 (13.1%)	14 (15.4)		
>60 days	53 (86.9%)	77 (84.6)		

## 5.0 Discussion

### 5.1 Knowledge of Exclusive Breastfeeding Among Mothers in Hospital USM

This study found that most mothers at Hospital Pakar USM had very good knowledge of exclusive breastfeeding (EBF), consistent with findings from studies conducted in Malaysia and internationally. For example, Ahmad et al. (2022) reported high knowledge scores among mothers in Kota Bharu, while Muda et al. (2022) found that all primiparous mothers in BFHI-accredited hospitals in Pahang demonstrated strong EBF knowledge. Both local studies (Ahmad et al., 2022) and international research by Kayode et al. (2023) reinforce these findings, indicating that initiatives such as the Baby-Friendly Hospital Initiative (BFHI) have increased awareness through policies, staff training, and support services.

The high level of knowledge reflects strong perceptions of the benefits of breastfeeding, including its role in preventing infections, supporting infant development, and aiding maternal recovery. However, this study also identified misconceptions that may affect practice. Some mothers misunderstood the definition of EBF, believing that giving formula or water during the first six months was acceptable. WHO and UNICEF (2022) also noted that widespread formula marketing undermines mothers' confidence in continuing breastfeeding. The researchers also identified knowledge gaps regarding the handling and storage of expressed breast milk (EBM). Misunderstandings about reheating methods, storage duration, and milk safety (Ibrahim & Abdul Hamid, 2019; Varghese et al., 2024) can influence maternal decision-making and weaken confidence in breastfeeding practices. Although overall knowledge levels are high, these specific gaps highlight the need for continuous education for parents and healthcare providers, as well as stricter regulation of formula marketing to reduce perceived barriers.

### 5.2 Practice of Exclusive Breastfeeding Among Mothers in Hospital USM

This study found that 59.9% of mothers practised exclusive breastfeeding (EBF) at an excellent level, while 40.1% demonstrated good practices. This represents an improvement compared to the 2016 National Health and Morbidity Survey (NHMS), which reported an overall EBF rate of 47.1% among Malaysian mothers. In this study, 80.9% of mothers used responsive feeding based on infant cues. However, many still relied on formula during work hours, with only a quarter avoiding formula entirely. This pattern suggests that although mothers recognise the perceived benefits of breastfeeding, supported by their high knowledge, particularly work-related challenges, reduce their ability to adhere to full EBF. This is supported by studies such as Hashim et al. (2020), which found that more than half of HUSM staff discontinued EBF within six months. Ibrahim and Abdul Hamid (2019) similarly reported that only 12.5% of working mothers at UiTM maintained EBF for the entire recommended period. Internationally, EBF rates remain low, such as 26.8% in Nigeria (Sabo et al., 2023). These findings indicate that although the implementation of BFHI, health education, and counselling are beneficial, they are still insufficient without strong environmental and workplace support. Institutional factors such as lactation rooms, storage facilities, flexible working hours, and adequate maternity leave are essential to reduce barriers and enhance mothers' confidence in sustaining exclusive breastfeeding (EBF).

### 5.3 Association Between Work-Related Factors and EBF Practice

#### 5.3.1 Working Hours

This study found no significant link between working hours and exclusive breastfeeding (EBF) practice ( $P = 0.559$ ), contrasting with findings from UiTM, where flexible working hours were positively associated with continued breastfeeding (Ibrahim & Abdul Hamid, 2019). The lack of association in this study may be due to the homogeneity of work schedules and the predominance of full-time workers. Uniform working hours may result in similar perceived barriers across respondents, reducing variability in outcomes.

#### 5.3.2 Availability of Private Lactation Rooms

Access to lactation rooms did not show a significant association with EBF practice ( $P = 0.233$ ). Although most mothers did not have this facility, it did not significantly influence their behaviour, which is consistent with findings from Selangor (Ibrahim & Abdul Hamid, 2019). However, studies such as Edemba et al. (2022) and Ickes et al. (2021) indicate that lactation rooms can serve as an initial step in providing a supportive environment.

#### 5.3.3 Availability of Refrigerators

Refrigerator access significantly influenced EBF practice ( $P = 0.011$ ), indicating that mothers with workplace refrigeration were more likely to maintain EBF due to safe storage of expressed milk. This supports research highlighting storage accessibility as a major determinant of sustained breastfeeding (Edemba et al., 2022). Access to a refrigerator reduces barriers to continuing EBF and increases mothers' motivation to practise exclusive breastfeeding.

#### 5.3.4 Maternity Leave Duration

There was no significant association between the duration of maternity leave and EBF practice ( $P = 0.697$ ). Although a longer leave period could theoretically reduce early discontinuation of EBF, the lack of workplace support upon returning to work may counteract this benefit. This is consistent with Kayode et al. (2023), who stated that maternity leave supports EBF only when accompanied by a supportive work environment.

This study fills an important gap in the literature on exclusive breastfeeding among working mothers by highlighting that workplace milk storage facilities, rather than working hours, maternity leave, or private rooms, have a significant influence on EBF practice ( $P = 0.011$ ). Access to a refrigerator directly reduces barriers and enhances self-efficacy, making it a practical factor that influences behaviour. In addition, the study reinforces that higher maternal knowledge improves perceived benefits and motivation to act, ultimately contributing to better overall EBF practices.

## 6.0 Conclusion & Recommendations

This study indicates that although mothers at HPUSM have strong knowledge of exclusive breastfeeding (EBF), practical barriers, particularly insufficient workplace support, still limit optimal EBF practice. Among all work-related factors, only access to milk storage via a refrigerator was significantly associated with EBF practice, highlighting the critical role of workplace infrastructure in supporting breastfeeding continuity. This suggests that high knowledge and awareness alone are insufficient without a supportive work environment. Therefore, strengthening breastfeeding-friendly policies, providing appropriate lactation spaces, and offering flexible working hours are important interventions to reduce structural barriers and enhance EBF sustainability. Regarding limitations, the smaller-than-expected sample size and short data collection period may limit the generalisability of the findings. Temporary employment status among some participants could also affect the representativeness of working mothers. In addition, online data collection may increase the risk of information-seeking bias, while restricting inclusion to mothers with six-month-old infants limits the study's ability to detect earlier discontinuation of EBF.

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## Paper Contribution to the Related Field of Study

This study provides important insights into how work-related factors affect exclusive breastfeeding (EBF) among postnatal mothers at HPUSM. It contributes to maternal and child health, nursing, public health policy, and occupational health, especially in Malaysia. The findings can help HPUSM enhance breastfeeding-friendly policies and support systems for working mothers.

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