



Determinants of Breastfeeding Initiation among Mothers Attending Breastfeeding Support Clinics; a cross-sectional study in Alexandria, Egypt

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ABSTRACT

Background: Timely breastfeeding initiation (BFI) decreases the risk of neonatal mortality and ensures breastfeeding continuation. Mothers need the assistance of trained staff to initiate breastfeeding timely. **Objective:** to examine the factors associated with delayed BFI among mothers attending breastfeeding support clinics. **Method:** A cross-sectional study was conducted on 200 mothers from three randomly chosen family health units in Alexandria. Mothers were interviewed to answer questions about demographic data, health service-related data (mode of delivery, neonatal illness, help offered by staff and the practice of “rooming-in”) and questions about breastfeeding practices and barriers they faced for BFI. **Results:** Mothers with successful BFI represented 55 % of the sample. Cesarean delivery was associated with delayed BFI compared to vaginal delivery (55.7% vs 15.1% $p < 0.001$). A higher percentage of infants with medical conditions and infants admitted to the Neonatal Intensive Care Unit (NICU) were associated with delayed BFI (57% and 71.6% respectively). In addition, receiving prenatal advice, hospital staff assistance and “rooming-in” were all associated with timely BFI ($p = 0.021$, < 0.001 , < 0.001 , respectively). Cesarean delivery has been proven a significant risk factor for delayed BFI (OR=11.692, 95% CI=3.922-34.86, $p < 0.001$). Furthermore, NICU admission and lack of health staff assistance for BFI were significant risk factors for delayed BFI (OR=4.6, 95 % CI=1.8-11.7, $p = 0.001$ and OR= 3.2, 95% CI=1.1 - 9.3, $p = 0.035$ respectively). **Conclusions:** Delayed BFI is common. High risk groups such as cesarean delivery and NICU admission need more BFI support and monitoring. Health facilities need training to implement the Baby-friendly Hospital Initiative.

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INTRODUCTION

Breastfeeding has a significant role in promoting health for both the infant and the mother.¹ Breastfeeding should be initiated during the first hour after birth and exclusive breastfeeding is recommended from birth to 6 months and continued along with complementary foods for two years as recommended by World Health Organization (WHO).² It has been demonstrated that BFI 2-23 hours after birth is associated with a 33 % increased

risk of neonatal mortality,³ and that neonates who were first put to the breast after 24 hours were at a higher risk of mortality compared to those breastfed within the first 24 after birth.⁴ Delayed BFI also makes it more challenging to establish and maintain breastfeeding.⁵ Globally, 48 % of neonates were breastfed within the first hour of life.⁶ According to Egypt's demographic Health Survey (EDHS) (2014)

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rates of early initiation of breastfeeding (EIBF) decreased from 40% in 2005 to 27% in 2014.⁷ Mothers need support and guidance to initiate breastfeeding timely within the first hour. Although the rate of institutionalized deliveries has been increasing, this has not resulted in an improvement of the EIBF rate, which is attributed to healthcare professionals' misconceptions and outdated practices that create a barrier to timely BFI, such as separating the newborn from mother and routinely giving newborn fluids other than breast milk.⁸ Contrary to cesarean delivery, vaginal delivery was associated with increases in both breastfeeding initiation and continuation. In addition, prenatal breastfeeding education was directly correlated with increased chances of both BFI and continuation.⁹ Therefore, the current study aimed to identify the barriers to breastfeeding initiation in the postpartum period faced by mothers who attended breastfeeding support clinics in Alexandria, Egypt.

METHOD

This was a cross-sectional study conducted from December 2018 to March 2019 in breastfeeding support clinics of Sidi Bishr, Smouha, and Al-Gazaier family medicine units in Alexandria. The study included mothers of infants ≤ 12 months with breastfeeding problems attending those clinics.

This was a multistage cluster sample. Three (3) districts were randomly chosen from the eight (8) health districts in Alexandria. One family medicine unit was chosen randomly from each health district: Sidi Bishr family medicine unit from El Montazah, Smouha from Sharq, and Al-Gazaier from El Amrya district. Mothers were proportionally allocated based on the average monthly attendance rate of the three randomly chosen family medicine units; 400 mothers attending Sidi-Bishr unit monthly, 300 attending Smouha, and 100 attending Al-Gazaier. The 200 mothers were allocated as 100 mothers from Sidi Bishr unit, 75 from Smouha, and 25 from Al-Gazaier.

Based on the percentage of mothers who faced problems regarding breastfeeding initiation, which was 60.3%,⁷ the minimum sample size calculated was 200 mothers, using a margin of error of 7% at a 95% confidence level and design effect = 2. The sample size was calculated using Epi- Info 7 software.¹⁰

A structured interview questionnaire was developed by the researcher based on data from previous studies.^{9,11} Content validity of the tool was indicated

by a panel of experts in the field of nutrition and maternal and child health. The data of questionnaire was divided into four sections, i- Demographic data: age, education, employment, and residence. Educational level was divided into three categories: low (illiteracy, literacy, and primary education), middle (preparatory and secondary education), and high level (university education). Mothers were also asked about their reason for visiting the breastfeeding support clinic. ii- Health service-related data: mode of delivery, infant's medical condition and the need for neonatal intensive care unit (NICU) admission, help offered by hospital staff to start breastfeeding, type of advice or assistance given, and hospital practicing "rooming-in". iii- Mother's breastfeeding practices including the time of BFI, the use of pre-lacteal feeds, and duration of exclusive breastfeeding. Mothers in the non-initiation group were asked to report barriers they faced during initiation such as pain due to labor, baby refusal to breastfeed no "rooming in" after delivery, lack of knowledge about the importance of colostrum and EIBF within the first hours of delivery, medical condition of either the mother or the baby and admission of the newborn to NICU.

The variable of interest was BFI, categorized into the initiation group, which included mothers who initiated breastfeeding during the first 24 hours of birth. The non- initiation group referred to mothers who initiated breastfeeding after the first 24 hours of birth or did not initiate it at all.

Statistical analysis: Statistical analyses were performed using the SPSS software package, version 20 (Armonk, NY: IBM Corp). Categorical data were expressed using numbers and percentages, while numerical data were expressed using mean and standard deviation. A p-value ≤ 0.05 was considered significant in all statistical tests. For categorical variables, the Chi-square test (χ^2) was used to determine the associations between variables. Fisher's Exact or Monte Carlo correction: Correction for chi-square when more than 20% of the cells have an expected count of less than 5. A logistic regression test was used to test possible determinants for delayed BFI using the Odds ratio (OR) and 95% Confidence Interval. The dependent variable was delayed BFI, where mothers who initiated later than 24 hours are risk group and assigned "one", while mothers who initiated breastfeeding within 24 hours are non-risk and assigned "zero". Univariate analysis was performed to determine the significant predictors associated

Table (1): Distribution of the studied mothers according to demographic data and aim for a visit to breastfeeding support clinic

Demographic data	No. (%)
Age of the mother (years)	
Mean \pm SD.	29.63 \pm 6.59
Education	
Low	40 (20.0)
Middle	82 (41.0)
High	78 (39.0)
Occupation	
Employee	14 (7.0)
Professional work	24 (12.0)
informal work	33 (16.5)
Housewife	129 (64.5)
Residence	
Urban	176 (88.0)
Rural	24 (12.0)
Aim of the current visit	
Medical consultation about breastfeeding	30 (15.0)
Seeking subsidized formula milk for the first time	92 (46.0)
Receiving a monthly share of subsidized formula	78 (39.0)

with BFI. These variables were the type of delivery, place of delivery, medical condition of newborn, NICU admission, received breastfeeding advice, assistance for breastfeeding start and hospital "rooming-in".

RESULTS

According to Table 1, the mean age of studied mothers was 29.63 \pm 6.59 years. Mothers with a high degree of education represented 39% (n=78) of the sample. Almost two-thirds of the mothers (64.5%, n=129) were housewives and most of the mothers (88%, n=176) were living in urban areas. At the time of the study, almost half of the mothers (46%) visited the breastfeeding clinic to obtain subsidized formula milk for the first time; 39 % (n=78) of the mothers reported that they were receiving their monthly ration of subsidized formula, and only 15% (n=30) of mothers visited the clinic seeking medical consultation about breastfeeding.

According to Table 2, mothers who succeeded in BFI within the first 24 hours of delivery represented 55% (n=110) of the sample, while those who initiated breastfeeding after 24 hours or failed to initiate at all collectively were 45 %

Table (2): Distribution of the studied mothers regarding breastfeeding practices of current infant

Breastfeeding practices	No. (%)
Time of initiation of breastfeeding	
Within the first hour of birth	110 (55%)
Initiation group	
Within the first hour of birth	29 (14.5%)
After one hour and during the first 24 hours of birth	81 (40.5%)
Non-Initiation group	
After 24 hours of birth	90 (45%)
Did not initiate at all	76 (38%)
14 (7.0%)	
Colostrum feeding	
Yes	132 (66%)
No	68 (34%)
Pre-lacteal feeds	
Yes	165 (82.5%)
No	35 (17.5%)
Exclusive breastfeeding practice	
Did not breastfeed exclusively	87 (43.5%)
Exclusive breastfeeding for any duration	113 (56.5%)
- < 1 week	34 (17%)
- 1 week -< 1 month	56 (28%)
- 1 month -< 3 months	17 (8.5%)
- 3 months -6 months	6 (3%)

(n=90) of the sample. Two-thirds of mothers (66%, n=133) fed their newborns' colostrum, and most mothers (82.5%, n=165) gave pre-lacteal feeds to their infants. Regarding exclusive breastfeeding, 113 mothers (56. %) reported giving their infants only breast milk for a specific period. Less than one third of mothers (28%, n=56) were able to exclusively breastfeed for a period of one week to less than one month, 17 mothers (8.5%) were able to breastfeed for less than three months, and only six mothers breastfed their infant for a period of 3 to 6 months. Table 3 depicts the relation between BFI and health service-related factors. Almost half (55.7%, n=82) of women who delivered by cesarean delivery had delayed BFI, and 84.9% (n=45) of females delivered vaginally were successful in BFI within the first 24 hours, this difference between groups was significant (p<0.001). There was a substantial difference between BFI rates among governmental (51.1% initiation and 48. % non- initiation) and private hospitals (48.1% initiation and 51.9% non-initiation). Furthermore, the table shows that 17 females gave birth at home, and all succeeded in

Table (3): Relation of BFI to health service-related factors

Health service factors	Initiation of breastfeeding		Total	P
	Initiation (n = 110)	Non-initiation (n =90)		
	No. (%)	No. (%)	No. (%)	
Type of delivery				
Vaginal	45 (84.9)	8 (15.1)	53 (26.5)	<0.001*
Cesarean	65 (44.2)	82 (55.7)	147 (73.5)	
Place of delivery				
Home	17 (100)	0 (0.0)	17 (8.5)	
Governmental hospital	23 (51.1)	22 (48.9)	45 (22.5)	<0.001*
Private hospital	63 (48.1)	68 (51.9)	131 (65.5)	
Private Polyclinic	7 (100)	0 (0.0)	7 (3.5)	
Gestational age at delivery				
Very preterm 28-<32 weeks	0 (0.0)	6 (100)	6 (3)	
Moderate to late 32-<37 weeks	5 (25)	15(75)	20 (10)	<0.001*‡
Term ≥ 37 weeks	105 (60.4)	69 (39.6)	174 (87)	
The medical condition of the newborn				
Normal	67 (67)	33 (33)	100 (50)	0.001*
Has medical problems	43 (43)	57 (57)	100 (50)	
NICU admission				
Yes	19 (28.4)	48 (71.6)	67 (33.5)	<0.001*
No	91 (68.4)	42 (31.6)	133 (66.5)	
Received breastfeeding education				
Yes	15 (68.2)	7 (31.8)	22 (11)	0.021*
No	75 (42.1)	103 (57.9)	178 (89)	
Staff assisted to initiate breastfeeding				
Yes	28 (80)	7 (20)	35 (17.5)	
No	65 (43.9)	83 (56.1)	148 (74)	<0.001*
Not applicable [†]	17 (100)	0 (0.0)	17 (8.5)	
Type of assistance received				
Skin to skin	2 (100)	0 (0.0)	2 (1.0)	
Mouth to nipple	26 (78.8)	7 (21.2)	33 (16.5)	0.003*‡
Not applicable [§]	82 (49.7)	83 (50.3)	165 (82.5)	
Health facility “rooming-in”				
Yes	50 (87.7)	7 (12.3)	57 (28.5)	
No	43 (34.1)	83 (65.9)	126 (63)	<0.001*
Not applicable [†]	17 (100)	0 (0.0)	17 (8.5)	

p values based on Chi square test, *: Statistically significant at $p \leq 0.05$, †: mothers who delivered at home, ‡: *p* value for Monte Carlo for Chi square, §: mothers who did not receive any staff help for BFI

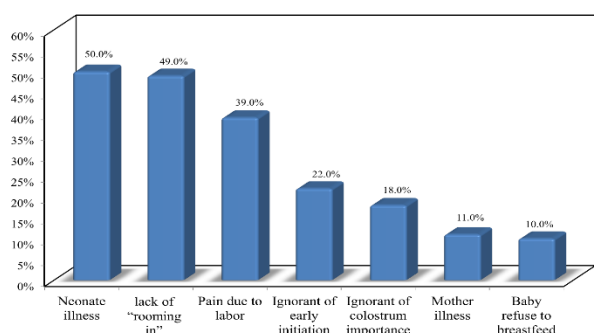
BFI, with a significant difference between groups ($p < 0.001$). Most of females whose newborns were admitted to NICU (71.6%, $n=48$) failed in BFI, with a statistically significant difference ($p < 0.001$). Most mothers (178 females) reported not receiving a prenatal breastfeeding education from health staff; among those 57.9% ($n=103$) failed in BFI, and 68.2% ($n=15$) of females who received prenatal breastfeeding education had a successful BFI, and this difference was significant ($p=0.021$). Only 35 females (17.5%) received assistance from health

staff for BFI, and 33 females were guided to do appropriate “mouth to nipple” practice. Of those 78.8% ($n=26$) succeeded in BFI, and 21.2 % ($n=7$) failed in BFI. “Skin to skin” practice was not a common practice, reported only by 1% ($n=2$) of the studied sample, and the difference between groups was significant ($p=0.003$). Additionally, “rooming-in” was reported by only 57 females (28.5%) of the sample, with 50 females (87.7%) succeeding in BFI. In contrast, 65.9 % ($n=83$) of females who reported no “rooming-in” failed in BFI and this difference was

Table (4): Multivariate logistic regression for predictors of late initiation of breastfeeding

	Sig.	OR	95% CI	
			LL	UL
Mode of delivery (0= vaginal, 1=cesarean)	<0.001*	11.692	3.922	34.863
NICU admission (0= no, 1= yes)	0.001*	4.633	1.835	11.698
Lack of staff assistance for BFI (0= no, 1=yes)	0.035*	3.175	1.084	9.297
Medical problem of newborn (0=normal, 1=ill)	0.016*	0.907	0.399	0.961
Not receiving breastfeeding advice or counseling (0=yes, no=1)	0.034*	0.227	0.058	0.896
No hospital "rooming in" (0=yes, 1=no)	0.002*	0.221	0.087	0.562

*: Statistically significant at $p \leq 0.05$



*Multiple response answer

Figure (1): Distribution of the mothers in non-initiation group according to perceived barriers to BFI (n = 90)

statistically significant ($p < 0.001$).

Mothers in the non-initiation group reported perceived barriers to BFI (Figure 1), the most common barrier reported was newborn illness and admission to NICU, followed by no "rooming-in" for the baby with the mother after delivery, followed by a lack of knowledge about the timing of BFI and importance of colostrum. Table 4 displays all risk factors for delayed BFI in multivariate logistic regression. The model shows that females who delivered by caesarian delivery were more likely for delayed BFI (OR=11.692, 95% CI=3.922-34.863, $p < 0.001$). Other significant determinants for delayed BFI were "newborn admitted to NICU" and "Lack of health staff assistance for BFI" (OR=4.633, 95% CI=1.835-11.698, $p = 0.001$ and OR= 3.175, 95% CI=1.084 - 9.297, $p = 0.035$ respectively). Both receiving a prenatal breastfeeding advice and practicing "rooming-in" were protective against delayed BFI (OR= 0.227, 95% CI= 0.058-0.896, $p = 0.034$ and OR= 0.221, 95% CI= 0.087-0.562, $p =$

0.002 respectively).

DISCUSSION

The current study investigated 200 mothers attending breastfeeding support clinics in Alexandria. The percentage of mothers who initiated breastfeeding within the first day after delivery was 55% (the initiation group). This percentage includes those who initiated within first hour of birth (14.5%) and those who initiated after one hour and during the first 24 hours of birth (40.5%). The non-initiation group represented 45%, and 82.5% of the mothers practiced pre-lacteal feeding. According to Egypt's Demographic Health Survey (EDHS) 2014, 79% of the children were put to the breast within the first day after delivery, only 27% within the first hour, and 63.5% practiced pre-lacteal feeding within three days of birth.⁷ A cross-sectional study of 12 Egyptian governorates, including Alexandria, discovered that BFI within the first hour of delivery was 25% and 39% in lower Egypt and Upper Egypt, respectively.¹² Initiation of breastfeeding after the first hour of life was associated with an increased risk of not being exclusively breastfed, and not being breastfed at all at one month and three months of age.¹³ Pre-lacteal feeding is common in Egypt, and it is associated with outdated hospital practices of giving the newborn other liquids, especially formula milk before it is put on the mother's breast. Mohammed et al. found that 42.7% of infants got pre-lacteal feeding in a community-based cross-sectional study conducted in a rural area in El-Minia governorate.¹⁴ Mothers subjected to caesarian delivery are affected by anesthesia and pain and cannot initiate breastfeeding early. Their newborns are separated from them in nurseries and given pre-lacteal feeds, which further reduce lactogenesis and might cause

breastfeeding discontinuation.^{15,16} In the present study, cesarian deliveries and institutionalized deliveries were significantly associated with delayed BFI after 24 hours of delivery, and mothers delivered by cesarean delivery had the highest odds of delayed BFI. Based on a secondary analysis of EDHS 2014 data concerning BFI, mothers subjected to caesarean delivery were more likely to delayed BFI (AOR= 2.25; 95% CI=1.84-2.74) and were more likely to practice pre-lacteal feeding (AOR=1.44; 95% CI=1.19-1.74).¹⁷ Similarly, in a cross-sectional study of 1700 mothers in Saudi Arabia, the multivariable logistic regression revealed that women who had vaginal delivery were more likely to achieve timely BFI than those with cesarian delivery (AOR=2.071; 95% CI=1.43-2.99).¹⁸ The United Nations Children's Fund (UNICEF)/WHO Baby-Friendly Hospital Initiative (BFHI) aims to promote breastfeeding by implementing the Ten Steps to ensure successful breastfeeding in health facilities providing maternity services.¹⁹ In the present study, receiving antenatal BF education, the assistance offered by staff to initiate breastfeeding, and the health facility practicing "rooming-in" were significantly associated with successful BFI. Mothers who did not receive any staff assistance were at higher risk for delayed initiation (OR=3.175, 95% CI=1.084-9.297). A similar study found that mothers who received prenatal education about breastfeeding were 41% more likely to initiate and continue breastfeeding than women who did not receive any education.⁹ Step 4 in BFHI focuses on putting the newborn bare of clothes on the skin of his mother's chest or abdomen immediately after the birth. Skin- to-skin contact helps BFI, stimulate the newborn to suckle at breast, and accelerates lactogenesis. Step 5 in BFHI focus on supporting mothers for BFI by the health staff by demonstrating the proper ways for latching and suckling at the breast.¹⁹ Immediate skin-to-skin care and breastfeeding initiation are very crucial, particularly following caesarean delivery. Skin-to-skin contact ensures BFI, reduces the use of formula supplementation in hospital, and positively impacts the health of newborn by preventing hypothermia and reducing newborn stress.²⁰ In addition, mothers who experienced immediate skin-to-skin contact after birth were more likely to be exclusively breastfeeding at three to six months.²¹ Breastfeeding has several benefits for ill or premature infants admitted to NICU and should be maintained for the first six months of life.²² In the present study, most mothers whose newborns were

admitted to NICU failed in BFI and it is a significant determinant for delayed BFI (OR=4.633, 95% CI=1.835-11.698, p=0.001). Breastfeeding ill or preterm infants in the NICU is challenging due to maternal and neonatal factors. The mother medical condition in addition to the mother-infant dyad separation delay BFI and inhibit milk expression.²³ Ensuring skin-to-skin contact and educating mothers about breast milk expression contributes to the success of breastfeeding ill or preterm infants.²⁴ A survey to collect data about practices of NICU breastfeeding revealed that staff believed that infants born less than 34 weeks gestational age have poor oral-motor skills to feed at the breast, which limits BFI.²⁵ In a German survey of breastfeeding practices in NICU, among infants whose mothers initiated breast pumping immediately after delivery, 61.8% were breastfed exclusively, and this percentage decreased as the initiation of pumping was delayed.²⁶ The main limitations of the present study were the small sample size and that the sample was representative of one sector only, which were mothers attending family medicine units. Future research should target mothers attending both governmental and private maternal health facilities.

CONCLUSIONS:

Cesarean delivery, NICU admission, and lack of hospital staff assistance are independent determinants of delayed BFI. Guidelines and policy of baby-friendly hospital initiative need to be adopted by all health facilities, and health staff must be trained and educated on BFI and lactation support.

Ethical Approval

An approval of the Ethics Committee of High Institute of Public Health was obtained. Permission from the Directorate of Health Affairs in Alexandria was obtained. Complete explanation of the purpose of the research was clarified to the mothers followed by taking their informed verbal consent.

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Author Contributions: Rana Emara: conceptualized the idea of the study, literature search and writing the manuscript; Asmaa Saleh: data collection, literature search; Dalia Tayel: analyzed the data and did the final revision to the manuscript.

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