

## Maternal -Newborn skin to skin contact and Initiation of Breastfeeding in Relation to Different Delivery Modalities



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### 1.ABSTRACT

**Background:** Different delivery modalities as vaginal delivery and cesarean delivery seem to have an impact on early breastfeeding practices. **Aim:** The study aimed to evaluate maternal-neonatal skin to skin contact and initiation of breastfeeding in relation to different delivery modalities. **Subjects and Method:** A descriptive design was utilized with a convenient sample from 223 lactating women (130 delivered by CS, and 93 by vaginal birth). Setting: The study was conducted at governmental Health Unit in Aga City, Egypt. Tools of data collection: Structured interview questionnaire. Results: Cesarean delivery was significantly associated with delayed skin to skin contact ( $p<0.001$ ), delayed breastfeeding initiation ( $p<0.05\%$ ). In addition, more breastfeeding difficulties ( $p<0.001$ ). **Conclusion and Recommendations:** The study concluded that CS had a negative effect on early breastfeeding practices. Women who have had a caesarean delivery should receive additional support and learn more about breastfeeding technique. In addition, women should be encouraged to seek antenatal care on a regular basis.

**Keywords:** Breastfeeding initiation, skin to skin contact, Vaginal delivery, Cesarean delivery, Breastfeeding problems

### 2.Introduction:

Different delivery modalities as vaginal delivery and cesarean delivery seem to have an impact on breastfeeding duration so timing of the first breastfeeding session after delivery is very important to maintain continuity of breastfeeding (Cato, Sylven, Lindbäck, Skalkidou & Rubertsson, 2017).

Breastfeeding problems that develop in the postpartum period have been identified as a significant factor that influences exclusive breastfeeding and the duration of breastfeeding (Karaçam & Sağlık, 2018). In the early postpartum period, there was a strong link between mode of delivery and breastfeeding difficulties; women who delivered cesarean section (CS) reported more difficulties (Chen et al.,2018; Zhang et al.,2019).

Cesarean section mothers experience more difficulty with latching, positioning, and pain than vaginal birth mothers, making it more difficult for them to begin breastfeeding at an early age. As a result, c-section mothers require more support and attention compared to mothers who gave birth vaginally before and after hospital discharge (Lagerberg, Wallby& Magnusson, 2020).

Despite global health education recommendations for early breastfeeding initiation, only 27% of moms initiate nursing early, and only 35% of newborns globally are exclusively breastfed. For various superstitions and ignorance, breastfeeding is started as late as the fifth day in some communities (World Health Organization & UNICEF,2018).

Breastfeeding should be start within the first hour of a baby's birth, as this is a critical time for breastfeeding success. As a result, the World Health Organization recommends initiation of breastfeeding and maternal-neonatal skin-to-skin contact as soon as possible after birth (within one hour) (World Health Organization,2017).

Only 9.7% of mothers in Egypt initiate breastfeeding either early or late after delivery, and only 39% of newborns in developing countries are breastfed exclusively within an hour after birth (World Health Organization,2017). If mothers start breastfeeding their babies at a young age, they can reduce neonatal mortality by 33% (Chang et al.,2019).

Several studies have discovered a strong link between mode of delivery and early bonding between mother and baby (Guala et al.,2017; Fischer, 2019; Cinquetti et al.,2019). who revealed that rates of skin-to-skin contact are lower significantly among Cs women compared to after an uncomplicated vaginal delivery due to maternal discomfort, anesthesia's influence, and a rise in the number of newborns requiring intensive care, as well as a lack of support.

Early bonding stimulates colostrum production. It stabilizes the newborn infant's blood sugar, facilitates maternal affectionate and attachment behaviors. It can also help in quicker recovery after a complicated delivery (Wambach & Spencer, 2019).

Additionally, delayed breastfeeding initiation, lack of breastfeeding upon request, signs of newborn's hunger, having calm newborn, not staying with the newborn, giving breast milk substitutes are factors which contribute to improper breast attachment.

Moreover, misconception that the child does not need night feedings, setting a specific time for breastfeeding, poor child's sucking power, and nipple soreness are other factors which contribute to low breast milk supply and inability to empty the breast (Bag, Saha, & Saha, 2020).

After a vaginal delivery, an infant's typical time from birth to first breastfeeding is quick, whereas a Cesarean newborn's first suck is delayed as well as the duration of the first breastfeeding was greater for babies after vaginal delivery on the first and second days after delivery than for those via CS (Gayatri, 2021).

Breastfeeding delays after a c-section has been linked to maternal/infant separation, impaired suckling capacity, decreased newborn receptivity, low milk production, anesthetic drug effects, baby crying while feeding, inability to position and hold baby due to extreme pain and fatigue, difficulty when pumping breast milk due to breast or nipple problems, post-operative care routines and maternal illness. All these barriers are predictive of shortened breastfeeding duration (Raihana, Huda, Alam, & Dibley, 2019).

At 24 and 48 hours, prolactin levels in women who had a vaginal delivery were considerably greater than those in women who had a caesarean surgery. This is due to women who had a caesarean section had a shorter or absent labor, anesthesia's effects, and drugs for postoperative pain treatment, low self-esteem, prolonged separation of neonates from their mothers as well as a later initiation of breastfeeding (Danis, 2020).

There were several studies found a strong link between CS delivery and late breastfeeding initiation conducted by (Hobbs et al.,2016). in Calgary, Alberta; (Chen et al.,2018).in China; (Raihana, Huda, Alam, & Dibley, 2019).in Bangladesh; (Erbaydar & Erbaydar, 2020); (Mamo, Dengia, Abubeker, & Girmaye, 2020). in Saudi Arabia and (Gayatri, 2021).in Indonesia, while there were studies conducted by (Prior et al.2012; Banapurmath, Ramachandrappa, Guruprasad & Biradar, 2013; Hobbs et al.,2016; Kiani et al., 2018). refuted this, finding that the timing of initiation breastfeeding initiation wasn't significantly related to mode of delivery.

If mothers start breastfeeding their babies at an early time, they can reduce neonatal mortality by 33% (Kumari & Kshatriya, 2018). Breastfeeding initiation rates are lower in infants born by caesarean section than in vaginal delivery (Isik, Dag, Tulmac, & Pek,2016). Cesarean newborns were given formula more frequently especially in the first three days following delivery, reducing the newborn's sucking capacity (Oakley et al.,2018). Infants who were given formula before being discharged from the hospital were nearly twice as

likely to not exclusively breastfeed for the first two months and to stop breastfeeding (Pierro, Abulaimoun, Roth & Blau, 2016; McCoy& Heggie, 2020).

### **Significance of the study**

Inefficient breastfeeding practices have negative implications especially in especially in countries with a low and moderate income (LMICs). They have been linked to an elevated risk of newborn and under-five mortality, which accounts for more than 0.8 million deaths yearly. Additionally, deterioration of economic status (Smith et al.,2017).

Breastfeeding rates within the first hour declined in Egypt from 40% in 2005 to 27% in 2014, correlating with an increase in caesarean delivery rates from 20% in 2005 to 52% in 2014, suggesting that caesarean delivery may be overused or utilized for inappropriate purposes, and the VD rate was 43% in 2014 (Egypt demographic and health survey ,2014)

Effective breastfeeding isn't practiced widely over the world. According to (Unicef,2016). Only 40% of children achieved exclusive breastfeeding in less than 6 months, and less than half (45%) hugged their mother's chest to begin breastfeeding within the first hour.

With each hour of delay in initiating breastfeeding, the chance of death from infections like sepsis, pneumonia, and diarrhea increases. After day one, initiating of breastfeeding later was linked to a 2.6-fold greater risk of infection-related newborn mortality. Whereas universal breastfeeding initiation within the first day and first hour of life might prevent roughly 7.7% and 19.1% of all newborn fatalities, respectively (World Health Organization,2017).

Breastfeeding support is a collective national objective in Egypt's 2030 strategy. The following is the outcome of breastfeeding in Egypt in 2030.According to the Global Breastfeeding Score Card, Early initiation in less than 1hour could raged at (Country 27%, region 50 %, world 45%), Exclusive at 0-5 months (Country 40%, region 44 %, world 43%), Continued at 1 year (Country 80%, region 87 %, world 74%), Continued at 2 years (Country 20%, region 46 %, world 46%) (Global breastfeeding Collective & UNICEF,2017; WHO ,2017).

### **Study Aim**

The current study aimed to evaluate maternal-newborn skin to skin contact and initiation of breastfeeding in relation to different delivery modalities.

### **Research question**

What are early breastfeeding practices in relation to different delivery modalities?

### **3. Subjects and Method**

#### **3.1. Study Design**

A descriptive design was utilized to accomplish the study's aim.

#### **3.2. Study Setting**

This study was carried out at Health Unit in Aga City, Egypt.

### 3.3. Subjects:

A convenient sample of 223 lactating women (130 were born with CS, while 93 were born vaginally) involved in the study sample.

### 3.4. Data collection tool:

One tool was utilized:

**A Structured Interview Questionnaire:** It was designed by the researcher after reading the relevant studies Pérez-Ríos, Ramos-Valencia & Ortiz, 2008; Zhang et al., 2019). It consisted of four parts (**Appendix I**). to measure the following:

**Part (a). Socio demographic data**, such as age at delivery, educational level, residence, marital status, occupation, family income.....etc.

**Part (b). Obstetric history**, such as mode of delivery, parity, gestational age, post-partum complications, NICU admission .....etc.

**Part (c). Breastfeeding practices in hospital**, such as Maternal-Newborn skin to skin contact, breastfeeding initiation, .... etc.

**Part (d). Breastfeeding difficulties in early post-partum days**, such as nipple problems, discomfort breastfeeding positions ..... etc.

### 3.5. Validity of the tool

Before using the tool, three experts in the field of obstetrics and gynecology nursing checked its validity, then made suggestions and minor changes.

### 3.6. Reliability

The structured interview questionnaire's reliability was tested and found to be good to high with a Cronbach's (alpha) value of 0.887.

### 3.7. Pilot Study

About 24 lactating mothers once the tool was prepared (10 percent of the targeted sample size). The lactating mothers who delivered vaginally and via cesarean and attended at Health Unit in Aga city. The pilot study was used to assess the tool's questions and statements for clarity and applicability, as well as the tool's feasibility, objectivity, and consistency, as well as to identify ambiguity in the study tool and check that the questions had the intended meaning. It also made it easier to estimate how long it will take to complete the questionnaire. The women in the pilot study were not included in the sample. This period lasted one month (September. 2020).

### 3.8. Field work

After taking written consent from the Health Unit in Aga city and participants, data collection lasted 6 months (from October 2020 to the end of March 2021). The researcher attended the health unit for three days weekly from 9 a.m. to 1 p.m. The researcher introduced herself and clarified the purpose of the study.

The researcher interviewed each woman individually for about 15 - 20 minutes to collect data by using the structured interview questionnaire

to evaluate maternal-neonatal skin to skin contact and initiation of breastfeeding among lactating mothers who delivered cesarean and vaginal.

### 3.9. Data analysis:

The results of data analysis and presentation were presented as descriptive results in the form of frequency and percentage, as well as mean and standard deviation. To examine the relationship between categorical variables, the Chi-square test ( $\chi^2$ ) was used. The association was statistically significant at a p value of 0.05, and it was highly statistically significant at a p value of 0.001.

### 3.10. Ethical Considerations

- A written consent was taken from the lactating mothers after taking a written permission from the Faculty of Nursing - Mansoura University's Research Ethics Committee and taking an official letter from the head of the Aga city's Health Unit after clarifying the aim of the study.
- All participants were given their right to withdraw voluntarily, their privacy, and their confidentiality. The study's findings will be made available to the public, and everyone will benefit.

## 4. Results

**Table 1:** There was highly statistically significant difference among women who delivered vaginally and c-section ( $P < 0.001$ ) regarding educational level. Also, high statistically significant difference regarding residence ( $P < 0.001$ ). In addition, high statistically significant difference concerning work status ( $P < 0.001$ ) and high statistically significant difference regarding family income ( $P < 0.001$ ). While there was statistically significant difference regarding women age ( $P = 0.003$ ).

**Table 2:** Shows that there was highly statistically significant difference among women who delivered vaginally and c-section regarding place of delivery ( $p < 0.001$ ). Also, there were statistically significant differences regarding parity, gestational age and NICU admission ( $P = 0.008$ ,  $P = 0.056$  &  $P = 0.006$  respectively).

**Table 3:** Shows that there was highly statistically significant difference among women who delivered vaginally and c-section regarding practice of maternal-neonatal skin to skin contact ( $P < 0.001$ ). Also, there was statistically significant difference regarding breastfeeding initiation and challenges for early initiation ( $P = 0.002$  &  $P = 0.019$  respectively).

**Table 4:** Shows that there was highly statistically significant difference among women who delivered vaginally and c-section regarding breastfeeding difficulties in early post-partum days ( $P < 0.001$ ). Also, there was statistically significant difference as to women complaint of nipple problems ( $P = 0.008$ ).

Table (1): Socio-demographic characteristics of the lactating women (N= 223)

Variables	Vaginal delivery VD (n=93)		Cesarean section CS (n=130)		Chi square test	
	No	%	No	%	$\chi^2$	P
<b>Age (years)</b>						
<20	5	5.4	4	3.1		
21-30	64	<b>68.8</b>	112	<b>86.1</b>		
31-40	18	19.4	14	10.8		
>41	6	6.5	0	0.0	13.947	<b>0.003*</b>
<b>Education level</b>						
University education	33	35.5	79	<b>60.8</b>		
Middle education	59	<b>63.4</b>	49	37.7		
Read and write	1	1.1	2	1.5	14.410	<b>&lt;0.001**</b>
<b>Residence</b>						
Rural	90	<b>96.8</b>	102	78.5		
Urban	3	3.2	28	<b>21.5</b>	15.190	<b>&lt;0.001**</b>
<b>Work Status</b>						
House wife	62	<b>66.7</b>	55	42.3		
Employee	31	33.3	75	<b>57.7</b>	12.899	<b>&lt;0.001**</b>
<b>Income</b>						
Not enough	31	33.3	13	10		
Enough	62	<b>66.7</b>	117	<b>90</b>	18.637	<b>&lt;0.001**</b>

\*(P) Significant at P ≤ 0.05 \*\* High significant at P ≤ 0.001

Table (2): Comparison of obstetric history among lactating mothers who delivered vaginally and CS. (N=223)

Obstetric history	Vaginal delivery(n=93)		CS (n=130)		Chi square test	
	NO	%	NO	%	$\chi^2$	P
<b>Parity</b>						
Once	68	73.1	107	<b>82.3</b>		
Twice	20	21.5	10	7.7		
>3 times	5	5.4	13	10.0	9.709	<b>0.008*</b>
<b>Place of delivery</b>						
Governmental	32	<b>34.4</b>	8	6.2		
Private	61	65.6	122	<b>93.8</b>	29.404	<b>&lt;0.001**</b>
<b>Gestational age</b>						
<37	0.0	<b>0.0</b>	5	<b>3.8</b>		
37-39	93	100	125	96.2	3.659	0.056
<b>Post-partum complications (n=4)</b>	N=0		N=4			
Post-partum hemorrhage	0.0	0.0	3	<b>75</b>	0	1.000
DVT	0.0	0.0	1	<b>25</b>	0	1.000
<b>NICU admission</b>						
Yes	2	2.2	16	<b>12.3</b>		
No	92	97.8	114	87.7	7.538	<b>0.006*</b>
<b>Neonatal problems</b>	N=2		N=16			
Low birth weight	1	50	6	<b>37.5</b>		
Transient tachypnea	0.0	0.0	5	31.2		
Physiological jaundice	1	50	5	31.2	0.884	0.643

\* Refers to significance if p value is less than 0.05, \*\* refers to highly significance if p value is less than 0.001

Table (3): Comparison of breastfeeding practices in hospital among lactating mothers who delivered vaginally and CS. (N=223)

	Vaginal delivery (n=93)		CS(n=130)		Chi square test	
	NO	%	NO	%	$\chi^2$	P
<b>Time Maternal-Newborn skin to skin contact</b>						
Immediate at delivery room	16	17.2	10	7.7		
< 1 hour	77	<b>82.8</b>	100	<b>76.9</b>		
1-2 hour	0	0	4	3.1		
>2 hours	0	0	16	<b>12.3</b>	18.75	<b>&lt;0.001**</b>
<b>Time for starting of Breastfeeding initiation (n=223)</b>						
<1 hour	89	<b>95.7</b>	105	<b>80.77</b>		
1 – 2 hours	3	3.2	6	4.6		
>2 hours	1	1.1	19	14.6	12.731	<b>0.002*</b>
<b>Assisting factors and challenges for early initiation of breastfeeding (&lt;1hour) (n=194)</b>						
	N=89	N=105				
Adequate breastfeeding support	56	<b>62.9</b>	85	<b>80.9</b>		
Antenatal health education	8	8.98	5	4.8		
Previous breastfeeding experience	25	28.1	15	14.2	7.891	<b>0.019*</b>
<b>Reasons for delayed initiation of breastfeeding (n=29)</b>			n=4	n=25		
Having general anesthesia	0	<b>0</b>	4	16		
Immediate NICU admission since delivery	1	<b>25</b>	11	<b>44</b>		
Post -partum complications	0	<b>0</b>	4	16		
Nipple problems as inverted nipple, cracked nipple	3	<b>75</b>	6	<b>24</b>	4.471	0.215
<b>Method of infant feeding in NICU (N=18)</b>		n=2		n=16		
Artificial feeding	2	<b>100</b>	16	<b>100</b>	0	1.000

\* Refers to significance if p value is less than 0.05, \*\* refers to highly significance if p value is less than 0.001

Table (4): Comparison of problems during breastfeeding practice within early post-partum days among lactating mothers who had vaginal delivery and CS (N=223).

Problems	Vaginal delivery (n=93)		CS (n=130)		Chi square test	
	NO	%	NO	%	$\chi^2$	P
<b>Experiencing breastfeeding difficulties (n=223)</b>						
No	66	70.96	24	18.5		
Yes	27	<b>29.0</b>	106	<b>81.5</b>	62.095	<b>&lt;0.001**</b>
	N=27		N=106			
<b>Nipple problems</b>						
No	12	44.4	76	71.7		
Yes	15	<b>55.6</b>	30	28.3	7.140	<b>0.008*</b>
<b>Discomfort during breastfeeding positions</b>						
No	17	62.96	46	43.4		
Yes	10	37.03	60	<b>56.6</b>	3.305	0.069
<b>Difficulty of baby to adjust breastmilk and neonatal gut problems after NICU discharge</b>						
No	25	92.6	90	84.9		
Yes	2	7.4	16	<b>15.1</b>	1.087	0.297
<b>Early intervention for breastfeeding difficulties and women insisted to give only breastmilk (n=133)</b>						
No	10	<b>37.03</b>	27	<b>25.5</b>		
Yes	17	62.96	79	74.5	1.433	0.231

### 5. Discussion

The present study was implemented to evaluate the maternal-newborn skin to skin contacts and time of breastfeeding initiation in relation to different delivery modalities. The current study results found that women who delivered C-section reported that late initiation of breastfeeding, delayed practice of early neonatal bonding, greater breastfeeding problems, and early use of formula feedings.

According to sociodemographic and obstetric histories of the mothers, the present study revealed that more than three-quarters of the mothers were primipara. Concerning age, majority of the cs women and more than two-thirds of the vaginal delivery women aged from 21 to 30 years were housewives with a middle educational level. While three-fifths of women who delivered CS employed and had high educational level. These findings had a negative impact on the success of lactation and were in agreement with a study done in Zagazig by (Abdallah, Eldin& Gad, 2018). Who revealed that the majority of the women they investigated were primiparous, under the age of 25, employed, and of rural origin, and that this had a negative impact on breastfeeding success and continuance owing to a lack of experience and job pressure.

The current study found highly statistically significant differences between women who delivered vaginally and by c-section in regard of level of education, work status, family income, and place of delivery. This was in line with research

performed by (Rabiepoor, Hamidiazar& Sadeghi, 2017). and the Ministry of Health, which found that the mode of delivery is connected to the mother's level of education, and that educated women and private hospitals had the greatest rates of caesarean birth because people who have better economic and living situations are more likely to succeed (Egypt demographic and health survey,2014).

Comparing lactating women who delivered CS and vaginal delivery regarding practice of maternal-newborn skin to skin contact, the current study finding showed that there was a strong link between mode of delivery and this practice. This finding supported by various studies done in Italy by (Guala et al.,2017; Fischer, 2019; Cinquetti et al.,2019). to study the effect mode of delivery on skin-to-skin practice and revealed that skin-to-skin contact was higher in vaginal birth than caesarean section with a strong significant association. This finding might be related to the fact that cesarean-delivery mothers find it difficult to maintain close contact with their babies due to wound pain and discomfort, requiring more home support on proper positioning. Furthermore, the effects of general anesthesia, their newborns' rapid admission to an intensive care unit, and post-partum complications.

According to Egypt's Ministry of Health and Population, breastfeeding rates within the first hour decreased from 40% in 2005 to 27% in 2014, correlating with a rise in caesarean birth rates from 20% in 2005 to 52% in 2014. This corresponded to the findings of our study, which indicated that mothers who gave birth to cs were more likely to delay breastfeeding for more than an hour. This

finding might be linked to an increase in neonatal critical care needs, a lack of prior experience, a lack of prenatal care, more nipple issues, post-partum difficulties, and the influence of general anesthesia.

In addition, the current study found a statistically significant link between mode of delivery and time of breastfeeding initiation. This finding supported by various studies conducted by (Hobbs et al.,2016). in Calgary, Alberta; (Chen et al.,2018).in China; (Raihana, Huda, Alam, & Dibley, 2019).in Bangladesh; (Erbaydar& Erbaydar, 2020); (Mamo, Dengia, Abubeker& Girmaye, 2020). in Saudi Arabia and (Gayatri,2021). in Indonesia. Who found that there was significant relationship between mode of delivery and breastfeeding initiation especially women who delivered cs delayed initiation more than those who delivered vaginally.

Inversely, this finding was in dissimilarity with that of (Kiani et al.,2018). Who examined association between mode of delivery and breastfeeding initiation among new mothers in Nicaragua, and found that no significant difference. The disparity might be explained by the fact that Nicaragua adopted policies to encourage early breastfeeding.

According to (World Health Organization,2003). Grading system for initiating to breastfeed early, 0-29% is regarded as poor, 30 – 49% as fair, 50-89% as good, and 90-100% as very good. In current study finding, early initiation of breastfeeding was (good) among women who delivered cs. This might be related to challenges for early initiation before hospital discharge between uncomplicated vaginal delivery and cs with lower post-partum complications. This was on the contrary a study conducted by (Shakya & Rana,2021). In Manipal Teaching Hospital which found the early initiation of breastfeeding was (poor) and their major barrier for delayed initiation was cesarean section in more than half of their studied mothers. The discrepancy might be explained by a decline in health-care quality, a lack of additional support from the health-care team, per-lacteal feeding, unskilled delivery personnel, increased post-partum problems, and inadequate post-natal care.

According to the findings of the current study, the majority of women who had CS had greater breastfeeding difficulties in the early postpartum days than women who delivered VD, with a high statistical association. These findings were in agreement with various studies conducted by (Hobbs et al.,2016). in Calgary, Alberta; (Chen et al.,2018) in China; (Cetisli, Arkan, & Top,

2018). in Izmir, Turkey; (Lagerberg, Wallby & Magnusson, 2020). This could be because women who gave birth via c-section had low LATCH score and require more support before and after hospital discharge.

Despite the difficulties of breastfeeding, more than half of the women in the current study were successful. In contrast, a cross-sectional descriptive study conducted by (Abdallah, Eldin & Gad,2018). in Zagazig to analyze obstacles experienced by breastfeeding women and found that delayed intervention for breastfeeding difficulties was more than half. This might be because the women in the current study insisted on only giving breast milk, and early intervention for breastfeeding problems. Others failed, because of a lack of awareness and discouragement about the need of early intervention, as well as a lack of breastfeeding support from family, many mothers turn to formula as a quick option.

## **6. Conclusion**

Based on the present study findings, it is concluded that c-sections are significantly associated with late initiation of breastfeeding, delayed practice of maternal-neonatal skin to skin contact, and greater breastfeeding difficulties when compared to vaginal deliveries. Additionally, the present study findings highlighted that woman aged 21-30 years old, primipara, women lived in rural areas, uncomplicated delivered vaginally women who were housewives versus employees with high educational level and who delivered CS.

## **7. Recommendation:**

**The following recommendations made in light of the current study's findings:**

1. Review anesthesia protocols to avoid the use of sedatives with natural births and the use of epidural and general anesthesia with C-sections to speed up the mother's recovery and avoid negative breastfeeding outcomes.
2. After CS delivery, the nurse should make sure that pediatrician and nursery staff are present to receive the newborn, and examination of the baby and help mothers to hold baby on their breasts and early initiate of breastfeeding. In addition to breastfeeding initiation and routine bonding should be encouraged in a surgical room.
3. Provision of an appropriate environment to breastfeed/express milk by mothers' engagement in NICU to breastfeed their babies by direct breastmilk or expressed

4. Restrict separation of the woman from her infant to the minimum period necessary

## 8. References

- 1- Abdallah, N. M. A., Eldin, S. A., & Gad, A. H. (2018). Breast and nipple problems encountered among puerperal primipara women in Zagazig. *International Journal of Pharmaceutical Research & Allied Sciences*, 7(1), 183-195.
- 2-Banapurmath, C. R., Ramachandrappa, S., Guruprasad, G., & Biradar, S. B. (2013). Is cesarean section a barrier to early initiation of breastfeeding. *Indian Pediatr*, 50(11), 1062-3.
- 3- Bag, T., Saha, M., & Saha, M. (2020). Not enough breast milk? Why? *Indian Journal of Child Health*, 7(7), 304-308.
- 4- Cato, K., Sylven, S. M., Lindbäck, J., Skalkidou, A., & Rubertsson, C. (2017). Risk factors for exclusive breastfeeding lasting less than two months—identifying women in need of targeted breastfeeding support. *PloS one*, 12(6), e0179402.
- 5- Chen, C., Yan, Y., Gao, X., Xiang, S., He, Q., Zeng, G., ... & Li, L. (2018). Influences of cesarean delivery on breastfeeding practices and duration: a prospective cohort study. *Journal of Human Lactation*, 34(3), 526-534.
- 6- Cinquetti, M., Colombari, A. M., Battisti, E., Marchetti, P., & Piacentini, G. (2019). The influence of type of delivery, skin-to-skin contact and maternal nationality on breastfeeding rates at hospital discharge in a baby-friendly hospital in Italy. *La Pediatria Medica e Chirurgica*, 41(1).
- 7- Chang, P. C., Li, S. F., Yang, H. Y., Wang, L. C., Weng, C. Y., Chen, K. F., ... & Fan, S. Y. (2019). Factors associated with cessation of exclusive breastfeeding at 1 and 2 months postpartum in Taiwan. *International breastfeeding journal*, 14(1), 18.
- 8- Cetisli, N. E., Arkan, G., & Top, E. D. (2018). Maternal attachment and breastfeeding behaviors according to type of delivery in the immediate postpartum period. *Revista da Associação Médica Brasileira*, 64(2), 164-169.
- 9- Danis, R. B. (2020). Contraception for the Postpartum Period. In *The Handbook of Contraception* (pp. 337-344). Humana, Cham.
- 10- Egypt demographic and health survey. (2014). Cairo, Egypt: Ministry of Health and Population and ICF International; 2015.
- 11- Erbaydar, N. P., & Erbaydar, T. (2020). Relationship between caesarean section and breastfeeding: evidence from the 2013 Turkey demographic and health survey. *BMC Pregnancy and Childbirth*, 20(1), 55.
- 12- Fischer, K. (2019). *Literature Analysis Comparing Mother-Newborn Skin-to-Skin Contact Following Cesarean Section and Vaginal Births* (Doctoral dissertation).
- 13- Guala, A., Boscardini, L., Visentin, R., Angellotti, P., Grugni, L., Barbaglia, M., ... & Finale, E. (2017). Skin-to-skin contact in cesarean birth and duration of breastfeeding: A cohort study. *The Scientific World Journal*, 2017.
- 14- Gayatri, M. (2021, April). Does a caesarean affect breastfeeding initiation? Evidence among women who delivered in health facilities. In *Proceeding International Conference of Innovation Science, Technology, Education, Children and Health* (Vol. 1, No. 1).
- 15- Global breastfeeding Collective, & UNICEF. (2017). WHO (2017). *Global Breastfeeding Scorecard, 2017: Tracking progress for breastfeeding policies and programmes*.
- 16- Guala, A., Boscardini, L., Visentin, R., Angellotti, P., Grugni, L., Barbaglia, M., ... & Finale, E. (2017). Skin-to-skin contact in cesarean birth and duration of breastfeeding: A cohort study. *The Scientific World Journal*, 2017.
- 17- Hobbs, A. J., Mannion, C. A., McDonald, S. W., Brockway, M., & Tough, S. C. (2016). The impact of caesarean section on breastfeeding initiation, duration and difficulties in the first four months postpartum. *BMC pregnancy and childbirth*, 16(1), 90.
- 18- Isik, Y., Dag, Z. O., Tulmac, O. B., & Pek, E. (2016). Early postpartum lactation effects of cesarean and vaginal birth. *Ginekologia polska*, 87(6), 426-430.
- 19- Kiani, S. N., Rich, K. M., Herkert, D., Safon, C., & Pérez - Escamilla, R. (2018). Delivery mode and breastfeeding outcomes among new mothers in Nicaragua. *Maternal & child nutrition*, 14(1), e12474.

- 20- **Karaçam, Z., & Sağlık, M. (2018).** Breastfeeding problems and interventions performed on problems: systematic review based on studies made in Turkey. *Turkish Archives of Pediatrics/Türk Pediatri Arşivi*, 53(3), 134.
- 21- **Kumari, S., & Kshatriya, G.K. (2018).** Breastfeeding practices among currently married women of selected tribes of Jharkhand, India. *International Journal of Community Medicine and Public Health*, 5(7), 2959-2967.
- 22- **Lagerberg, D., Wallby, T., & Magnusson, M. (2020).** Differences in breastfeeding rate between mothers delivering by caesarean section and those delivering vaginally. *Scandinavian Journal of Public Health*, 1403494820911788.
- 23- **Mamo, K., Dengia, T., Abubeker, A., & Girmaye, E. (2020).** Assessment of Exclusive Breastfeeding Practice and Associated Factors among Mothers in West Shoa Zone, Oromia, Ethiopia. *Obstetrics and gynecology international*, 2020.
- 24- **McCoy, M. B., & Heggie, P. (2020).** In-hospital formula feeding and breastfeeding duration. *Pediatrics*.
- 25- **Oakley, L., Benova, L., Macleod, D., Lynch, C. A., & Campbell, O. M. (2018).** Early breastfeeding practices: Descriptive analysis of recent Demographic and Health Surveys. *Maternal & child nutrition*, 14(2), e12535.
- 26- **Pérez-Ríos, N., Ramos-Valencia, G., & Ortiz, A. P. (2008).** Cesarean delivery as a barrier for breastfeeding initiation: the Puerto Rican experience. *Journal of Human Lactation*, 24(3), 293-302.
- 27- **Prior, E., Santhakumaran, S., Gale, C., Philipps, L. H., Modi, N., & Hyde, M. J. (2012).** Breastfeeding after cesarean delivery: a systematic review and meta-analysis of world literature. *The American journal of clinical nutrition*, 95(5), 1113-1135.
- 28- **Pierro, J., Abulaimoun, B., Roth, P., & Blau, J. (2016).** Factors associated with supplemental formula feeding of breastfeeding infants during postpartum hospital stay. *Breastfeeding Medicine*, 11(4), 196-202.
- 29- **Raihana, S., Huda, T., Alam, A., & Dibley, M. (2019).** Factors Associated with Delayed Initiation of Breastfeeding Among Hospital Deliveries: Secondary Analysis of Bangladesh Demographic and Health Survey 2014 (P18-107-19). *Current developments in nutrition*, 3(Supplement\_1), nzz039-P18.
- 30- **Rabiepoor, S., Hamidiazar, P., & Sadeghi, E. (2017).** The relationship between type of delivery and successful breastfeeding. *International Journal of Pediatrics*, 5(5), 4899-907.
- 31- **Smith, E. R., Hurt, L., Chowdhury, R., Sinha, B., Fawzi, W., Edmond, K. M., & Neovita Study Group. (2017).** Delayed breastfeeding initiation and infant survival: A systematic review and meta-analysis. *PLoS one*, 12(7), e0180722.
- 32- **Shakya, N., & Rana, M. M. (2021).** Barrier of early initiation of breastfeeding among postnatal mothers: Barrier of early initiation of breastfeeding. *Journal of Patan Academy of Health Sciences*, 8(1), 101-109.
- 33- **Unicef. (2016).** From the first hour of life: making the case for improved infant and young child feeding everywhere. *New York: UNICEF*.
- 34- **World Health Organization, & UNICEF. (2018).** Marketing of breast-milk substitutes: national implementation of the international code, status report 2018.
- 35- **World Health Organization. (2017).** Infant and young child feeding. Retrieved from <http://www.who.int/mediacentre/factsheets/fs/342/en/>
- 36- **Wambach, K., & Spencer, B. (2019).** *Breastfeeding and human lactation*. Jones & Bartlett Learning.
- 37- **World Health Organization. (2017).** Early Initiation of Breastfeeding: The Key to Survival and Beyond. Breastfeeding is today the single most effective preventive intervention for improving the survival and health of children.
- 38- **World Health Organization. (2003).** Infant and young child feeding: a tool for assessing national practices, policies and programmes.
- 39- **Zhang, F., Cheng, J., Yan, S., Wu, H., & Bai, T. (2019).** Early feeding behaviors and breastfeeding outcomes after cesarean section. *Breastfeeding Medicine*, 14(5), 325