Effectiveness of Instructional Module on Breast Problems among Post Cesarean Section Mothers

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ABSTRACT

Contents: Enhancement of exclusivity of breastfeeding and increasing its duration is a recognized public health priority. Several common problems may arise during the breastfeeding period and mainly after cesarean section delivery, so assisting mothers in coping with and solving the problems may contribute to successful breastfeeding.
Aim: The study aimed to evaluate the instructional module's effectiveness on breast problems among post-cesarean section mothers.
Methods: Quasi-experimental study (pre/post-test) design was used. A purposive sample of 100 women recruited in this study, which was conducted at the Postnatal Inpatient Maternity Unit & Breast-Feeding Clinic at Ain Shams University Maternity Hospital. The study utilizes six tools: A structured Arabic interview questionnaire, LATCH breastfeeding charting scale, mothers' self-care practice observational checklist, Visual Analogue Scale, Six-point breast engorgement scale, and the Nipple Trauma Score, in addition to developed supportive material (instructional module).
***Results*:** A highly statistically significant improvement in all mothers' self-care practices in dealing with breast problems at the post and follow-up of intervention compared to pre-intervention ($P < 0.001$). Also, there is a highly statistically significant reduction of breast problems among the study sample at the post and follow-up of intervention compared to pre-intervention ($p < 0.001$). The study also reveals a reduced degree of pain, breast engorgement, and nipple trauma score with highly statistically significant improvement on the total LATCH scale at the post and follow-up of intervention compared to pre-intervention ($P < 0.001$).
***Conclusion*:** The present study concluded that the implementation of the instructional module has improved the mothers' self-care practice and has a positive effect on alleviating breast problems among post-cesarean section mothers. The study recommended an educational program regarding breast problems and their related management should be included in routine care for post-cesarean women.

Keywords: Instructional module, breast problems, post-cesarean mothers

1. Introduction

Breastfeeding is a natural process that leads to improved infant and maternal health outcomes in both developed and developing countries and is recommended as the conventional and unequaled method for feeding infants *(Gertosio, et al., 2016)*. Optimal breastfeeding practices have long been known to reduce neonatal and child mortality. Morbidities such as respiratory infections, diarrhea, otitis media, atopic dermatitis, gastroenteritis are also decreased. There is growing evidence indicates that breastfeeding may protect against obesity and type 2 diabetes *(Victora et al., 2016; Kavle, et al., 2017)*. Exclusive breastfeeding (EBF) is the single most effective preventive intervention for reducing child mortality, with the potential of saving 1.3 million lives worldwide each year *(Victora et al., 2016)*.

Breastfeeding has significant maternal health benefits, contributing to faster uterine involution, decreased risk of postpartum hemorrhage, reduced risk of mothers with gestational diabetes developing type 2 diabetes, birth spacing, and longer durations are associated with reductions in ovarian and breast cancer. Breastfeeding also has economic benefits for the whole family and society *(World Health Organization, 2017)*.

The World Health Organization (WHO) recommends mothers initiate breastfeeding within 1 hour of birth and exclusive breastfeeding for the first six months of life, followed by continued breastfeeding with appropriate complementary foods up to 2 years or beyond *(WHO, 2017b)*.

The delivery by cesarean section is an operative approach replacing the natural process of delivery. Its rates tend to increases during the last few decades. Cesarean section is associated with non-initiation or delayed initiation of breastfeeding due to several factors, including mothers' health and emotional reactions to the surgery and infant health and behavior. Also, breast problems are highly associated with cesarean section delivery, especially for primiparous women. For instance, women's restricted mobility in the early days after cesarean birth may hinder efforts to provide basic infant care, including breastfeeding *(Thomas, 2016)*.

Several breast problems may appear in the puerperal period after the cesarean section. Common ones are breast engorgement, nipple problems, plugged milk duct, breast abscess, infection, and insufficient milk supply originated from conditions that lead the mother to inadequately empty the breasts. Incorrect breastfeeding techniques, infrequent breastfeeding, and breastfeeding at scheduled times,

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pacifiers, and food suppliers can predispose to these breast problems. The proper and adequate management of those conditions is fundamental, as if not treated, they result in breast complications and even breast cancer *(Kavle, et al., 2017).*

Women who experience cesarean births may neglect breast care and delay breastfeeding initiation due to the pain after the surgery and difficulties in the early movement. So, concentrate on appropriate pain management strategies to facilitate better breastfeeding experiences is inevitable. Promoting and supporting breastfeeding is an integral part of the role of the midwife. Teaching must begin early to assess and meet the mother's needs, ideally before birth *(Victora et al., 2016).* Therefore, nurses should assist mothers in coping with and solving the problems they may encounter in successful breastfeeding through postpartum mothers' support to initiate breastfeeding within 30 minutes after delivery, provide guidance educational program regarding correct breastfeeding technique and positions before developing breast problems *(Thomas, 2016).*

Nurses contribute to women, children, and families' health and well-being by enhancing practical skills and specialized care for preventing and managing breastfeeding problems after cesarean section. One of the important roles conducted by the midwife is being a lactation consultant or community nurse to contribute to the prevention of such problems through comprehensive breastfeeding assessment, counseling, educating and guidance of mother both prenatal and postnatal to facilitate intervention and the development of successful breastfeeding plan *(Chung et al., 2017).*

2. Significance of the Study

Cesarean section is strongly linked with delayed lactogenesis, poorer infant sucking, delay in early breastfeeding, decreased breastfeeding success, more supplementation, and shorter breastfeeding duration. These factors lead to common breast complications such as breast engorgement, painful nipple, nipple trauma, mastitis, and breast abscess. Moreover, the incidence of cesarean section in Egypt was remarkably doubling from 26.7 percent to 51.8 percent between 2008 and 2014, according to the Egyptian Demographic Health Survey (EDHS) *(WHO, 2017a).*

The international healthcare community has considered the ideal rate for cesarean sections a concomitant with breast problems between 10% to 15% of total post-cesarean section women worldwide *(Hobbs et al., 2016).* In Egypt, the prevalence of breast complications post-cesarean section represented 3% to 33% of lactating mothers within the last five years *(Egyptian Demographic Health Survey (EDHS) (WHO, 2017a).*

Based on this, there is a growing body of research regarding the importance of alleviating breast problems to ensure exclusive breastfeeding as a trendy issue worldwide. Also, women knowledge and practice would be a valuable approach for planning for appropriate education and counseling program in addition to this, the current research will cover the needs and problems of a significant group of the community representing lactating mothers through applied research and new evidence-based practice that will assist health care providers, specialist nurses, and midwifery in providing education through instructional module built on facts resulting from recent evidence, therefore, researchers suggested this study to evaluate the effectiveness of implementing instructional module on breast problem among post-cesarean section mothers.

3. Aim of the study

The present study aimed to evaluate the effectiveness of an instructional module on breast problems among post-cesarean section mothers. This aim was achieved through the following:

- Assessing the presence of breast problems among post-cesarean section mothers.
- Assessing mother's self-care practices regarding the management of breast problems after cesarean section.
- Designing and implementing an instructional module for managing breast problems among post-cesarean section mothers.
- Evaluating the effect of an instructional module on breast problems among post-cesarean section mothers.

3.1. Operational definition

The breast problems studied in this research included breast engorgement, cracked nipple, breast abscess, flat nipple, nipple trauma, lack of milk production, mastitis, and pain.

3.2. Research hypotheses

- Post cesarean section mothers exposed to the instructional module will have improved self-care practice regarding breast problems compared to the pre-intervention level.
- Post cesarean section mothers exposed to the instructional module will have alleviated breast problems compared to the pre-intervention level.
- Post cesarean section mothers exposed to the instructional module will have improved breastfeeding techniques compared to the pre-intervention level.

4. Subjects & Methods

4.1. Research design

A quasi-experimental design (one group pre-test post-test design) was utilized to fulfill this study's aim. A quasi-experiment is an empirical interventional study used to estimate an intervention's causal impact on the target population without random assignment. Quasi-experimental research shares similarities with the traditional experimental design or randomized controlled trial, but it specifically lacks the element of random assignment to treatment or control *(Dinardo, 2008; Iowa State University of Science and Technology, 2020).* In a pretest-posttest design, the dependent variable is measured once before the treatment is implemented and once after it is implemented *(Posternak & Miller, 2001; Spurlock, 2018).*

4.2. Research setting

The study was conducted at the Postnatal Inpatient Maternity Unit and Breast-Feeding Clinic at Ain Shams University Obstetric and Gynecological Hospital. An educational hospital affiliated to Ain Shams University Hospital was built in 1930.

It serves a very large sector of citizens and huge flow rate with a nominal cost. It provides many services to women such as outpatient clinics, follow-up of pregnancy, childbirth unit, early detection unit, intensive care unit, gynecological operation, breastfeeding counseling clinic, and postnatal units for post-cesarean section women care that consist of 6 units, each unit includes six rooms.

4.3. Subjects

A purposive sample was recruited with the following:

Inclusion criteria

- Mothers who had cesarean section delivery with breast problems at the postnatal period.
- Mothers who had delivered a single full-term fetus, free from any complications, affect breastfeeding as cleft lip and cleft palate.
- Women who can at least read and write.

Exclusion criteria

- Mothers suffered from any medical disease.
- Mothers who had delivered normal vaginal delivery.

The sample size included one hundred post-cesarean section mothers recruited according to Steven Thompson Equation *(Khuanbai, 2019).*

$$N = \frac{Z^2(P(1-p)}{d2}$$

Where,

- N =Sample size
- Z: Statistics for a level of confidence. (For the level of confidence of 95%, which is conventional, Z value is 1.96).
- P = the expected proportion in population-based on previous studies.
- d=error percentage = (0.05). So,
- $N = \frac{(1.96)^2(0.07\times(1-0.07)}{0.05\times0.05}$
- $N = \frac{(1.96)^2(0.07\times(0.93)}{0.05\times0.05}$

$N = \frac{4\times0.260}{0.0.002505\times0.05}$

N=104

Based on the above formula, the sample size required for the study was 100 post-cesarean section mothers.

4.4. Tools of the study

4.4.1. A Structured Interviewing Questionnaire

After reviewing the relevant literature *(Mohan, 2018),* the researcher designed the structured interviewing questionnaire to collect the necessary data related to the study aim. The interviewing questionnaire was used in the Arabic language pre/post-intervention. The time consumed to fill the questionnaire was about 15-20 minutes. It consisted of 27 questions (multiple choice & closed-ended questions); covering three parts as the following;

The first part was intended to assess the study sample's general personal characteristics as age, marital status, level of education, occupation, and residence (5 questions).

The second part included obstetrical history such as gravida, parity, mode of the previous delivery, complication during a previous pregnancy, labor and postpartum period, and breast problems during the previous puerperium (15 questions).

The third part consisted of the current postpartum history of the study sample regarding the time of initiation of breastfeeding, duration of breastfeeding, frequency of feeding, type of breast problems during the current puerperium, causes of delayed initiation of breastfeeding, signs and symptoms of breast problems (7 questions).

4.4.2. Mothers' Self-Care Practices Observational Checklist

The researcher developed it based on *WHO & UNICEF (2009); Gubler et al. (2013); WHO, (2016)* to assess mothers' self-care practice regarding the management of breast problems after cesarean section as management of breast engorgement (10 steps), cracked nipple (9 steps), flat nipple (4 steps), breast abscess (15 steps), lack of milk production (5 steps), mastitis (10 steps), and nipple trauma (8 steps. Overall test-retest reliability coefficients were Cronbach's alpha values of 0.94.

Scoring system

It was scored as the following two categories: (1 mark) for doing correct practice and (0 marks) for not doing. The total practice scores were classified as the following:

- Unsatisfactory practice（<60%)
- Satisfactory practice (≥60%)

4.4.3. LATCH Breastfeeding Charting Scale

It was developed by *Altuntas et al. (2014)* to evaluate breastfeeding techniques based on observations and effective breastfeeding descriptions. The letters of the acronym, LATCH, designate separate areas of assessment: "L" for how well the infant latches onto the breast; "A" for the amount of audible swallowing; "T" to describe the type of the mother's nipple; "C" for the mother's level of comfort; and "H" for the amount of support the mother has given to hold her infant to the breast. Overall test-retest reliability coefficients were Cronbach's alpha values of 0.92.

Scoring system

The system assigns a numerical score of (0, 1, 2) to five key breastfeeding components, and the total score ranged from 0 to 10, with a higher score representing better breastfeeding techniques.

4.4.4. Visual Analogue Scale (VAS)

It was adopted from *Berens (2015)* to assess the degree of breast pain among post-cesarean section mothers. It consisted of a 10-cm line anchored at each end with words such as "no pain" was scored as 0; mild pain was scored

from 1-3; moderate pain was scored from 4-7, and (severe/worst pain) was scored 8-10. Cronbach's alpha revealed internal reliability of 0. 94.

4.4.5. Six-Point Breast Engorgement Scale

It was adopted from *Hill (2008)* to assess the degree of breast engorgement. It is a Likert-type scale that ranged from 1 to 6. Each scoring indicates the following description: Soft, no changes in breast scored as (1), slight changes in the breast scored as (2), firm, no tender breast scored as (3), firm, beginning tenderness in breast scored as (4), firm, tender scored as (5), and very firm, very tender scored as (6). Cronbach's alpha revealed internal reliability of 0.88.

4.4.6. Nipple Trauma Score (NTS)

It was adopted from *Abou-Dakn et al. (2011)* to assess the degree of nipple trauma. It is a Likert-type scale scored from 0 to 5. Each scoring indicates the following description: No microscopically visible skin changes scored as (0), erythematic or edema or combination of both scored as (1), superficial damage with or without scab formation of less than 25% of the nipple surface scored as (2), superficial damage with or without scab formation of more than 25% of the nipple surface scored as (3), partial-thickness wound with or without scab formation of less than 25% of the nipple surface scored as (4), partial-thickness wound with or without scab formation of more than 25% of the nipple surface scored as (5). Cronbach's alpha revealed internal reliability of 0.90.

4.4.7. The Developed Supportive Material (Instructional Module)

The researchers developed it based on the recent literature review *WHO & UNICEF (2009); Gubler et al. (2013); WHO (2017b)* to enhance mothers' knowledge and practices regarding breastfeeding and breast problems after cesarean section. It was designed using simple Arabic language and different illustrative pictures to facilitate the mother's understanding of its contents. It consisted of an introduction, general objectives, and the content. The content is composed of two parts.

The first part consisted primarily of education about breastfeeding, including meaning, benefits, positions, techniques, correct baby latching and suckling, signs of hungry and fullness of the newborn.

The second part focused on the most common breast problems among post-cesarean section mothers: breast engorgement, nipple trauma, cracked nipple, flat nipple, breast abscess, mastitis, and proper self-care measures that could apply to alleviate those problems.

4.5. Procedures

The research process was evaluated for feasibility. The tools' content validity was assessed by five experts from the Maternity-Gynecological Nursing Department, the Public Health Department, the Faculty of Nursing, Obstetrics-Gynecology Department, Faculty of Medicine, Ain Shams University. Their comments were considered.

The pilot study was carried out in three weeks on 10% of the sample (10 mothers). The pilot study was conducted to assess the tools' clarity, comprehensiveness, and feasibility of the study process. The necessary modifications were done based on the pilot study findings, such as (omission and addition of some questions from/to the tools) to strengthen their contents, or for more simplicity and clarity, or to be concise and focused. These groups were excluded from the study sample.

Ethical approval was obtained from the Scientific Research Ethical Committee of the Faculty of Nursing at Ain Shams University before starting the study. Informed consent was obtained from participants after explaining the purposes of the study. No harmful methodology was used with participants. Each participant had the right to withdraw from the study at any time. Human rights were granted. Data were confidential, and a coding system for data was used.

Fieldwork: The study was carried out through three phases: assessment, implementation, and evaluation phase. These phases were carried out from the beginning of December 2019 to May 2020, covering six months. The researchers visited the previously mentioned setting three days per week from 9.00 am to 2.00 pm until the sample size was completed. The researchers took into consideration safety precautions against COVID19 infection followed by WHO guidelines **(***World Health Organization, 2020)* and the Egyptian ministry of health *(Ministry of Health and Population, 2020)* as it was pandemic during the data collection period; for example, wearing masks, keeping a one-meter distance, hand washing and using the antiseptic solution (alcohol 70%), also the researchers followed the rules and regulation of the hospital for safety measure.

Assessment phase: At the beginning of the interview, each researcher introduced herself to the participants and explained the study's aim to gain their trust and confidence to participate in the study. Then verbal consent of the mother was obtained. The researchers started to interview mothers to fill the interviewing questionnaire that assesses their general characteristics. Then the researcher assessed mothers' breastfeeding technique by using the LATCH breastfeeding chart scale.

After that, the researcher marked mother breast pain level using a visual analog scale, degree of breast engorgement using a six-point breast engorgement scale for mothers who developed breast engorgement, and nipple trauma score, nipple description of nipple trauma score for mothers suffered from nipple trauma. Then researchers assessed mothers' self-care practices regarding the management of breast problems after cesarean section by using mothers' self-care practices observational checklist.

Tools of data collection took 25-30 minutes to be completed. The data obtained during this phase constituted the baseline for further comparisons to assess the intervention's effect.

Implementation phase: The instructional module was intervened and distributed by the researcher for each mother individually through two 30-45 minutes sessions.

First session; the researchers started the first session with an orientation about the module objectives, contents, and impact on the mothers' condition. Then started to provide instructions regarding breastfeeding, benefits, position, technique, correct baby latching and suckling, signs of hungry, and fullness of the newborn.

Second session: the researchers focused on the most common breast problems after cesarean section as breast engorgement, nipple trauma, nipple sore, breast abscess, mastitis, and flat nipple. The instructions included definitions, causes, signs, symptoms, and self-care measures to alleviate them. The researcher gave instructions based on the mother's condition and their breast problems.

Various teaching methods were utilized in the current study as lecture, discussion, demonstration, and re-demonstration. Suitable teaching aids were used, including PowerPoint presentations, video films, and lab models. The researcher used the lab model as the infant model to train mothers to perform the correct breastfeeding technique and common breastfeeding position. Each mother re-demonstrated the skills individually.

The researcher arranged for a follow-up date with participants, also communicated with mothers via cell phone or WhatsApp for instructions, reinforcement, and follow-up.

Evaluation phase: The self-instructional module effect was evaluated by comparing breast problems among post-cesarean section mothers and their self-care practices to manage these problems before and post-intervention by 7 and 14th days at the outpatient clinic or by phone using the same pre-intervention tools.

4.6. Limitations of the study

- There were some difficulties in data collection due to the interruption of the health worker and mothers' relatives.
- The data collection time and implementation of the instructional module were at the epidemic of COVID19, so it required many restrictions and precautions related to hospital rules and regulation and the need for more time to fulfill the required sample size due to decreased women flow rate.

4.7. Data analysis

The collected data was revised, coded, tabulated, and introduced into a personal computer using a Statistical Package of Social Sciences (IBM SPSS 20.0). Data were presented as frequency and percentage of non-numerical data. Mean, standard deviation (+SD), and range for parametric numerical data. Cochran's Q test is an extension to the Mcnemar test for related samples that provides a method for testing differences between three or more matched sets of frequencies or proportions. ANOVA test is used to analysis of variance and examined whether group means differ from one another. ANOVA is used to analyze the differences among three or more groups' means in a sample. The level of significance was considered as follows.

- P $>$ 0.05: Non-significant (NS)
- P $\leq$ 0.05: Significant (S)
- P $\leq$ 0.01: Highly significant (HS)

5. Results

Table 1 displays the mean age of the studied sample was 26.18±4.79, 98% of them were married. Regarding the level of education, 35% of the studied sample had secondary education while 25% had a university education, 78% were housewives, and 80% of them were from an urban area.

Table 2 shows that 67% of the studied sample were 2-3 gravid, while 14% were primigravida. Regarding parity, 71% of them were para 2-3, with the mean number of deliveries 2.56±1.16. 76% of them were delivered by cesarean section before. Only 20% of them had a previous complicated pregnancy, labor, and postpartum. However, 55% had breast problems during previous postpartum, whereas breast engorgement was the main problem among 32.7%, 23.6% had cracked nipples, and 12.7% suffered from nipple pain.

Table 3 points out that 76% of the study sample initiated their breastfeeding more than two hours after cesarean section, 58% of the study sample feed their baby for 10 minutes, and 52% of mothers have one hour of the frequency of breastfeeding. Regarding breast problems, 30% of the study sample complained of breast engorgement, followed by those who complained of nipple trauma 22%, cracked nipple 14%, flat nipple represented 13%. In contrast, only 6% of them have a lack of milk production.

Figure 1 reveals that the main cause for delay initiation of breastfeeding was pain at the CS site that represented 77% of the study sample, followed by lack of anticipatory guidance and support represented 66%, and lack of breast milk**,** 26%.

Figure 2 illustrates that the most frequent signs and symptoms of breast problems among the study sample were breast tenderness represented 88%, breast pain 87%, swelling 66%, redness of the breast 33%, fever 20%, and discharge 10%.

Table 4 clarifies a highly statistically significant improvement in self-care practices of the studied sample regarding the management of breast engorgement, cracked nipple, flat nipple, breast abscess, lack of milk production, mastitis, and nipple trauma at the post and follow up of intervention compared to pre-intervention ($p < 0.001$).

Figure 3 demonstrates that 16% of the studied sample had satisfactory total practices score regarding the management of breast problems pre-intervention reached 86%, 88% at the post and follow up of intervention, respectively.

Table 5 clarifies current breast problems among study samples pre, post, and follow-up of intervention. It reveals that 30% of mothers complained from breast engorgement pre-intervention reached 6%, 0 at the post and follow-up of intervention respectively. Also, 22% had nipple trauma pre-intervention reached 10%, 4% at the post and follow-up of

intervention, respectively. Also, 14% complained of cracked nipples pre-intervention reached 5%, 2% at the post and follow-up of intervention. Also, 13% had flat nipple reached to 3%, 1% at the post and follow-up of intervention respectively with a highly statistically significant difference between pre, post, and follow up of intervention regarding all breast problems ($p < 0.001$).

Figure 4 demonstrates that 68% of the study sample had a severe degree of pain at pre-intervention while 70%, 88%, had no pain at the post and follow-up of intervention, respectively.

Table 6 shows a highly statistically significant reduction in the degree of pain, breast engorgement, and nipple trauma scores among the study sample, in addition to highly statistically significant improvement on latching score at the post and follow-up of intervention compared to pre-intervention ($p <0.001$).

Table (1): Frequency and percentage distribution of study sample personal characteristics (n=100).

Personal characteristics	No.	%
Age (Mean±SD)	26.18± 4.79	
Marital status		
Married	98	98.0
Divorced	0	0.0
Widowed	2	2.0
Education		
Read and Write	21	21.0
Primary education	19	19.0
Secondary education	35	35.0
University education	25	25.0
Occupation		
Working	22	22.0
Housewife	78	78.0
Residence		
Rural	20	20.0
Urban	80	80.0

Table (2): Frequency and percentage distribution of study sample obstetric history (n=100).

Obstetrical history	No.	%
Gravida		
1	14	14.0
2-3	67	67.0
>3	19	19.0
Mean±SD	2.74 ± 1.32	
Parity		
1	14	14.0
2-3	71	71.0
≥ 4	15	15.0
Mean±SD	2.56 ±1.16	
Mode of previous delivery (no=86)		
Normal delivery	10	10.0
Cesarean section	76	76.0
Previous pregnancy, labor, postpartum complications:		
No	80	80.0
Yes	20	20
Breast problems during the previous puerperium:		
Yes	55	55.0
No	45	45.0
Types of breast problem in the previous puerperium		
Breast engorgement	18	32.7
Mastitis	6	11.0
Breast abscess	5	9.0
Cracked nipple	13	23.6
Nipple pain	7	12.7
Flat nipple	6	11.0

Table (3): Frequency and percentage distribution of study sample current postpartum history (n=100).

Current postpartum history	No.	%
Time of initiation of breastfeeding after delivery		
After1/2 hour	0	0.0
After 1 hour	4	4.0
After 1&1/2 hour	8	8.0
After 2 hours	12	12.0
After more than 2hours	76	76.0
Duration of breastfeeding		
10 minutes	58	58.0%
10-20 minutes	30	30.0%
>20 minutes	12	12.0%
Frequency of feeding (in an hour)		
1 hour	52	52.0%
2hours	36	36.0%
3hours	12	12.0%
Type of breast **problems during current puerperium**		
Breast engorgement	30	30.0
Nipple trauma	22	22.0
Cracked nipple	14	14.0
Mastitis	7	7.0
Breast abscess	8	8.0
Flat nipple	13	13.0
Lack of milk production	6	6.0

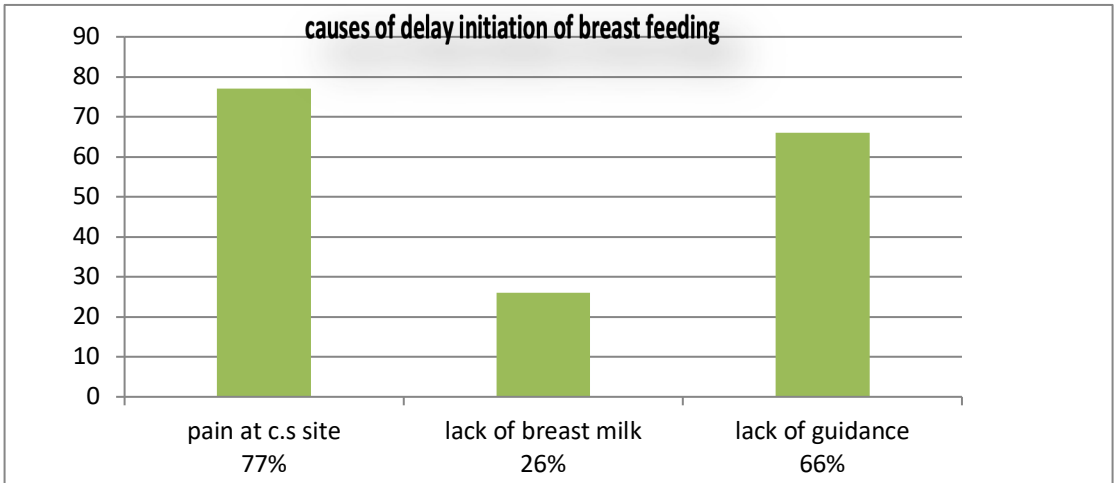

Figure (1): Percentage distribution of the study sample causes or delays breastfeeding initiation (n=100).

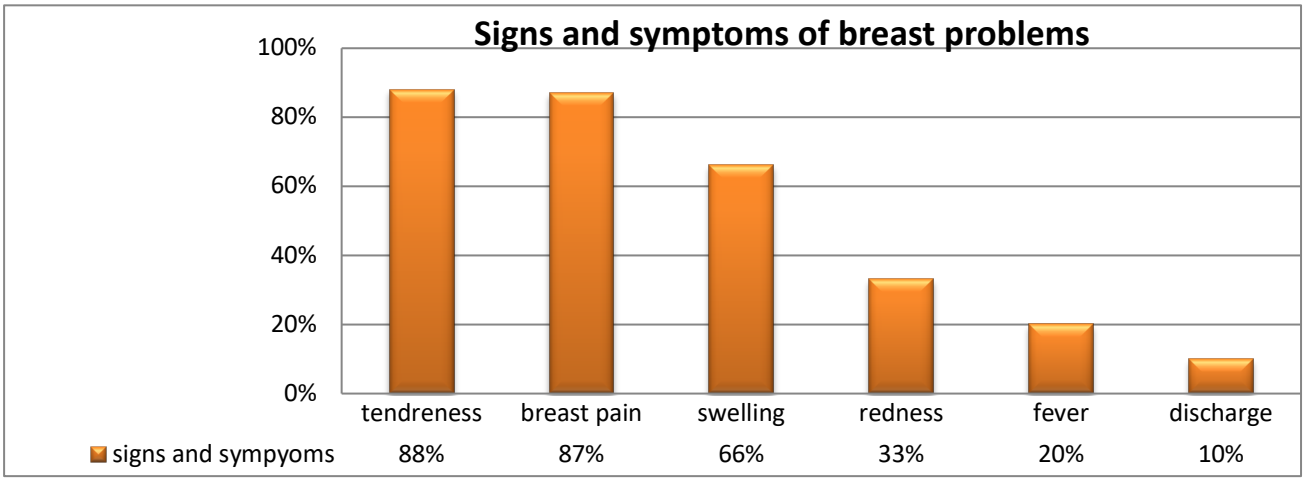

Figure (2): Percentage distribution of the study sample signs and symptoms of breast problems (n = 100).

Table (4): Comparison of mothers' self-care practices regarding breast problems post-cesarean section pre, post, and follow-up of the instructional module (n=100).

Breast problems	Pre		Post 7th day		Follow up 14th day		Cochrane (Q test)	P-value
	No	%	No	%	No	%		
Engorged breast								
Satisfactory	6	20.0	26	86.7	27	90.0	41.43	0.001
Unsatisfactory	24	80.0	4	13.3	3	10.0		
Total	**30**	**100.0**	**30**	**100.0**	**30**	**100.0**		
Cracked nipple								
Satisfactory	1	7.1	11	78.6	12	85.7	21.58	0.001
Unsatisfactory	13	92.9	3	21.4	2	14.3		
Total	**14**	**100.0**	**14**	**100.0**	**14**	**100.0**		
Flat nipple								
Satisfactory	2	15.4	12	92.3	11	84.6	20.28	0.001
Unsatisfactory	11	84.6	1	7.7	2	15.4		
Total	**13**	**100.0**	**13**	**100.0**	**13**	**100.0**		
Breast abscess								
Satisfactory	1	12.5	7	87.5	7	87.5	**12.8**	0.002
Unsatisfactory	7	87.5	1	12.5	1	12.5		
Total	**8**	**100.0**	**8**	**100.0**	**8**	**100.0**		
Lack of milk production								
Satisfactory	0	0.0	5	83.3	5	83.3	11.25	0.004
Unsatisfactory	6	100.0	1	16.7	1	16.7		
Total	**6**	**100.0**	**6**	**100.0**	**6**	**100.0**		
Mastitis								
Satisfactory	2	28.6	6	85.7	6	85.7	6.857	0.032
Unsatisfactory	5	71.4	1	14.3	1	14.3		
Total	**7**	**100.0**	**7**	**100.0**	**7**	**100.0**		
Nipple trauma								
Satisfactory	4	18.2	19	86.4	20	90.9	24.36	0.001
Unsatisfactory	18	81.8	3	13.6	2	9.1		
Total	**22**	**100.0**	**22**	**100.0**	**22**	**100.0**		

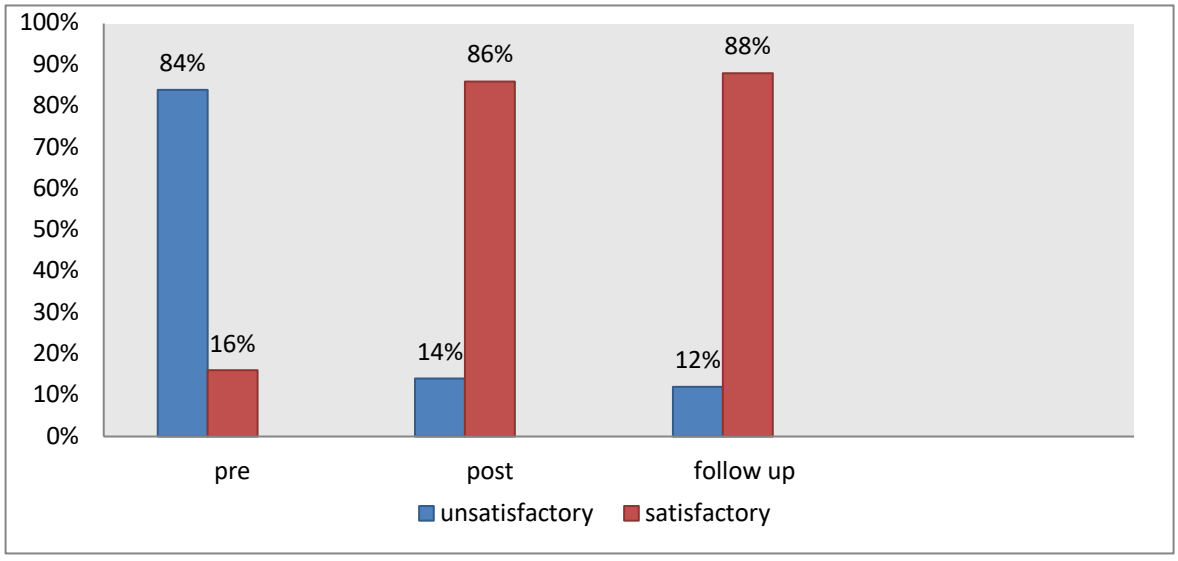

Figure (3): Percentage distribution of study sample total self-care practices regarding breast problems at pre, post, and follow up of instructional module (n=100).

Table (5): Comparison of mothers' current breast problems post-cesarean section at pre, post, and follow-up of the instructional module (n=100).

Breast problems	Pre		Post		follow up		Cochrane Q test	P-value
	No	%	No	%	No	%		
Breast engorgement	30	30.0	6	6.0	0	0.0	47.73	0.001
Cracked nipple	14	14.0	5	5.0	2	2.0	11.98	0.003
Breast abscess	8	8.0	2	2.0	1	1.0	8.116	0.017
Flat nipple	13	13.0	3	3.0	1	1.0	15.46	0.001
Nipple trauma	22	22.0	10	10.0	4	4.0	15.91	0.001
Lack of milk production	6	6.0	2	2.0	2	2.0	20.1	0.001
Mastitis	7	7.0	2	2.0	2	2.0	36.3	0.001

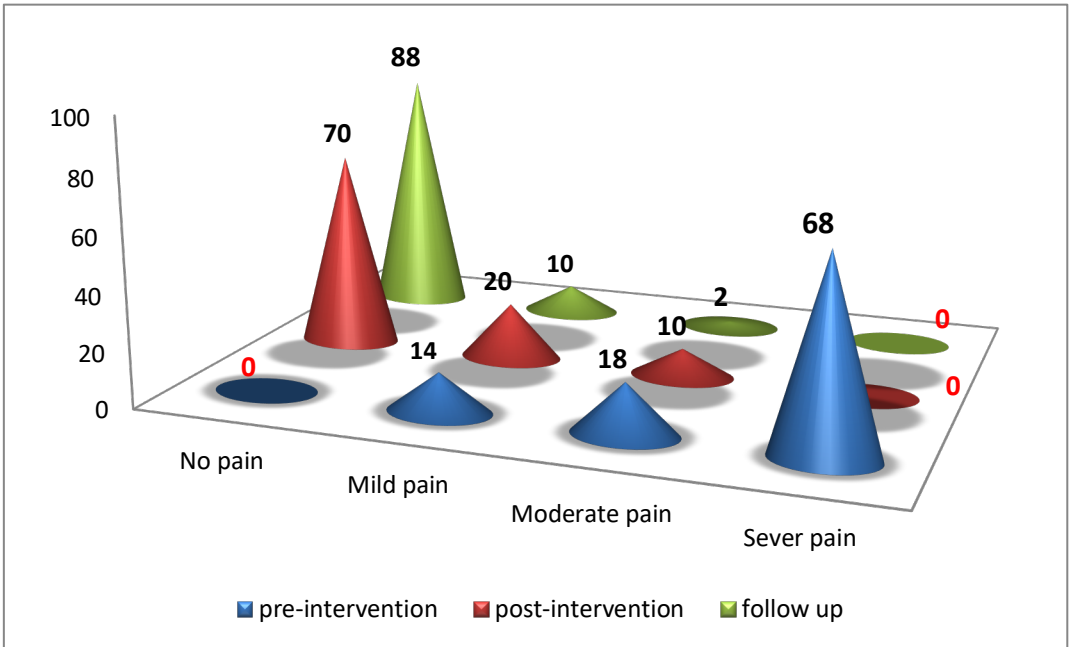

Figure (4): Percentage distribution of the study sample pain degree at pre, post, and follow up of intervention (n=100).

Table (6): Comparison of study sample regarding total pain, breast engorgement, Nipple trauma, and LATCH score at pre, post, and follow up of instructional module.

Breast problems	Pre	Post	Follow UP	ANOVA-test	p-value
	Mean±SD	Mean±SD	Mean±SD		
Pain Score (n= 100)	7.23±2.72	3.18±2.70	1.31±2.34	136.3	0.001
Breast Engorgement (n= 30)	4.57±1.01	1.3±0.65	1.0±0.0	244.64	0.001
Nipple trauma score (n= 22)	3.5±1.14	0.77±1.02	0.23±0.53	77.382	0.001
LATCH Scale (n= 100)	6.12±0.03	8.53±1.24	10.21±1.41	359.533	0.001

6. Discussion

National and international health promotion strategies encouraged initiation, increasing duration, rate, and exclusivity of breastfeeding and pointed to the irrefutable benefits of breastfeeding for babies, mothers, society, and the environment *(Mostafa et al., 2015).* Unfortunately, many mothers delivered by cesarean section might experience various breast problems or difficulties, especially in the first month postpartum as sore nipple, breast engorgement, mastitis that ended up in the early introduction of bottle feeds. Formula feeding will lead to an interruption in initiation and continuation of breastfeeding, thus reducing the rate of exclusive breastfeeding in the first two months postpartum. So, the midwives should offer the mother the most effective strategies to prevent and enhance coping with these problems and help eliminate disparities in women and infants' care concerning breastfeeding *(Chung et al., 2017).* In light of the previous outline, a quasi-experimental research design was used in this study to evaluate the effectiveness of an instructional module on breast problems among post-cesarean section mothers.

Regarding women's characteristics, the current study shows that the studied sample mean age of 26.18± 4.79, almost all of them were married, more than one-third of the studied sample had secondary education, about more than three quadrants were housewives, and the majority of them were from an urban area. The current study also illustrates

that about two-thirds of the studied sample was 2-3 gravid, while nearly three-quarters of them were para 2-3 and delivered by cesarean section before. Only less than one-fourth of them had a previous complicated pregnancy, labor, and postpartum. However, slightly more than half of them had breast problems during previous postpartum, whereas breast engorgement was the main problem among them, and more than one-tenth suffered from nipple pain. These findings were in the same line with *Ebrahim and Esmat. (2018),* this similarity may be due to the similar settings, culture, and lifestyle between the two studies samples.

Early initiation of breastfeeding, particularly within the first hour, is important for both the mother and the newborn, as suckling stimulates the release of hormones that help produce milk. It also stimulates the uterus' contraction after childbirth and decreasing the likelihood of postpartum hemorrhage *(Mohan, 2018).* As regard to initiation of breastfeeding among the studied sample, the current study points out that more than three-quarters of the study sample initiated their breastfeeding after the first two hours post-cesarean section, more than half of the study sample feed baby for 10 minutes and has one hour as the frequency of breastfeeding. The most common causes of delays in breastfeeding initiation accompanying cesarean section delivery in this study were associated with pain at the incision site among more than three-fourths of the studied mothers, insufficient milk supply among more than one-quarter of them, and absence of support and guidance after delivery among two-thirds of them.

The result of the present study was following a study conducted by *Mızrak (2017),* who displayed that more than three-quarters of the studied mothers had breast problems and not initiated breastfeeding in the first 2 to 3 hours after delivery, due to pain at the incision site, lack of anticipatory guidance and support, and lack of milk produced. Furthermore, a lack of previous experience in breastfeeding and a lack of family support. This similarity could be justified by cesarean section delivery. It was a significant barrier to breastfeeding as mothers who had cesarean section delivery need more postoperative pain relief drugs. This pain medication received during and after delivery can suppress breastfeeding and decrease breast milk. Besides, fatigue and stress lead to a decrease in breast milk *(Kuguoglu et al., 2012).*

The present study finding was also supported by a study done by *Shrooti and Dhakal (2016)* to assess knowledge and practice regarding breastfeeding among 30 mothers who delivered through cesarean section at Dharan, Nepal. They mentioned that only less than one-fifth of mothers-initiated breastfeeding after one hour; meanwhile, most mothers initiated after two hours. This finding confirmed the evidence that initiating and establishing early breastfeeding following a cesarean birth is more difficult compared to vaginal birth, and the most common reasons for delayed breastfeeding after cesarean delivery were late shifting from recovery, pain, and discomfort after cesarean section *(Karlström, et al., (2007).*

The mothers of the current study suffered from different forms of breast problems pre-intervention as one-third of women complained from breast engorgement, followed by those who complained from nipple trauma among near one quarter, cracked nipple, and flat nipple among more than one-tenth, while lack of milk production was the least problem experienced by mothers. This finding could be justified by cesarean section delivery was a significant barrier for experiencing early and continue breastfeeding as mothers who had cesarean section delivery had more difficulties as pain and restricted movement that may result in many breast problems. This finding was following *Abdallah et al. (2018),* who conducted a study of breast and nipple problems encountered among puerperal primiparous women in Zagazig. It revealed that the majority of women were exposed to nipple soreness and breast engorgement. This similarity may be due to similar sample characteristics, culture, and experience between the two studies.

Contrary to the current study findings, a study was done by *Prasad et al. (2017)* revealed the data about the breastfeeding problems in postnatal mothers showed that most mothers had inadequate milk. Other problems included the refusal of suckling. On the other hand, breast engorgement and cracked nipples were the least problems experienced by mothers. The differences might be attributed to methodological variations related to sampling and data collection tools.

Regarding signs and symptoms of breast problems experienced by mothers, the current study explains that the most frequent breast problems among the study sample were breast tenderness followed by breast pain, swelling, and redness of the breast, fever, and finally, nipple discharge. These signs and symptoms were present and associated with breast engorgement, that was the significant problem experienced by mother among our study sample.

Similar to the results mentioned above, the signs and symptoms of breast problems reported by Ebrahim *and Esmat (2018)* in a study investigate the effect of educational program on mothers' using non-pharmacological therapies to alleviate breast engorgement after cesarean section. The study revealed that more than three-quarters of mothers complained of tender and firm breasts while nearly two-thirds complained of the breast's hotness and redness.

This finding was also in agreement with *El Saidy and Aboushady (2016),* who conducted a quasi-experimental study to reduce the level of breast engorgement among the ninety postnatal mothers and to compare the effect of warm compresses versus cold cabbage leaves on breast engorgement. They mentioned that the most reported breast problems were breast pain, redness, fatigue, and warmness during touch.

On evaluating mothers' self-care practice regarding the management of breast problems including breast engorgement, cracked nipple, flat nipple, breast abscess, lack of milk production, mastitis, and nipple trauma, the current study findings clarify a highly significant improvement of mothers' self-care practices at the post and follow up of intervention compared to pre-intervention.

Most of them had an unsatisfactory practical level in dealing with breast problems pre-intervention. This finding may be explained by the fact that these women did not receive enough information about correct breastfeeding techniques and positions and a lack of awareness of post-cesarean section mothers. This finding is supported by the current study results that two-thirds of the mothers reported a lack of guidance regarding breastfeeding initiation.

In the current study, most mothers had significant improvements in total practices level at the post and follow-up of intervention compared with their pre-intervention level. This finding may be due to continuous education and support by utilizing instructional modules and telephone follow-up that provided them great support and encouraged post-cesarean section mothers to improve their self-care practices regarding breast problems and enhance their participation in performing their care. This finding is supporting the first research hypothesis.

The previous study finding is evident by *Ding and Luo (2019),* who concluded that lack of experience and poor practice about the technique of breastfeeding and coping with breast and nipple problems could influence the duration and success of breastfeeding. These results assured the importance of education by using the instructional module to improve women's self-care practices and reduce the undesired sequences of such problems on mother and newborn.

Additionally, *Ding and Luo (2019)* evaluated the effect of prenatal educational programs on women's practice to prevent breastfeeding problems after cesarean delivery. The study generally showed malpractice regarding the technique of breastfeeding and breastfeeding problems among control group women, with negative impacts on the occurrence of breast problems during the postnatal period. In contrast, the educational program successfully improved women's practice of breastfeeding technique and breast problems, with subsequent better outcomes among them regarding the occurrence of breast problems. This similarity emphasized the golden role of education in enhancing self-care practice and alleviating breast problems among post-cesarean women.

This result was consistent with a study by *Shinde (2015)* that aimed to assess the effect of the self-instructional module on the knowledge regarding the expression and storage of breast milk among postnatal working women residing in selected areas of PCMC, Pune City, India. The self-instructional module was significantly effective in improving knowledge and practice regarding the expression and storage of breast milk of postnatal working women. This result is also corroborated with *Deshmukh. et al. (2016),* who conducted a study to investigate the knowledge, attitude, and practice of breastfeeding at a tertiary care center in the government medical college and hospital in Aurangabad, India, and found out that inadequate prenatal education regarding breastfeeding will increase breastfeeding-related problems. This similarity highlighted the significance of health care providers and nursing staff to actively participate in proper counseling and education of mothers about the benefits of breastfeeding, proper techniques, and positions.

Regarding the effect of implementing an instructional module on alleviating breast problems among the studied sample, the present study reveals a remarkable reduction in breast problems among the study sample in post and follow-up intervention compared to pre-intervention. This reduction was significant in problems that included breast engorgement, cracked nipple, breast abscess, flat nipple, nipple trauma, lack of milk production, mastitis, respectively, between pre, post, and follow-up of intervention. These findings are supporting the second research hypothesis.

Supporting the results of this interventional study, *Folami et al. (2018)* conducted a study to evaluate the effectiveness of the nursing intervention on breastfeeding-related problems among nursing mothers in selected primary health clinics in Lagos, Nigeria. It indicated that the use of educational materials and practical demonstrations for breastfeeding mothers might significantly improve initiation and duration of exclusive breastfeeding by reducing common breast problems reported by mothers. The participant's positive response on the importance of proper positioning of mother and baby and effective latch might be due to the nursing intervention.

An important finding in the current study was that implementing instructional modules regarding breast problems positively affected the degree of pain, breast engorgement, and nipple trauma score with highly statistically significant improvement at the post and follow-up of intervention compared to pre-intervention. The study assured that providing the mother guidance, instructions, and support on dealing with such problems and modifying self-practices may reduce breast problems.

In the same line, *Ebrahim and Esmat (2018)* proved that educational programs regarding non-pharmacological therapies positively affected alleviating breast engorgement after cesarean section by improving mothers' knowledge and reducing the degree of pain, breast engorgement, and improve baby latch among post-cesarean section women. This finding agreed with *Indrani and Sowmya (2019)*, who conducted a quasi-experimental study to assess and compare the efficacy of an intervention program to treat breast engorgement among 60 postnatal mothers. They reported that the overall paired t-test value was significant at the level of $p < 0.001$. This finding showed a significant improvement in breast engorgement score in both interventions and emphasized the important role of education in managing such problems.

In accordance, *Mostafa et al. (2015)* conducted a comparative intervention study to evaluate the effect of evidence-based guidelines for alleviating traumatic nipples among nursing mothers at the postnatal maternity unit and outpatient family planning clinic, Ain Shams University Maternity Hospital. It arrived at the evidence that all mothers suffered from different degrees of traumatic nipple. The study also showed that most mothers had poor practices regarding breastfeeding and did not react toward nipple trauma pre-intervention; meanwhile, after the

intervention, it concluded that evidence-based guidelines positively affected mothers' practices and the degree of the traumatic nipple. This accordance assured that mothers' education, which is scientifically and practically based, positively affected the reduction of such breast problems.

The degree of pain experienced by mothers in this study demonstrates a significant reduction in the pain degree at the post and follow-up of intervention compared to pre-intervention, as more than two-thirds of the study sample had severe pain degree at pre-intervention. In contrast, the majority of them had no pain at follow-up of intervention.

From the researcher's perspective, breastfeeding problems can be avoided if the mothers understand the basics of breastfeeding techniques, proper breastfeeding techniques (positioning, latching, and sucking), and the "let down" of milk are crucial to exclusive breastfeeding and long-term breastfeeding success. According to our study findings, adequate practice and the right breastfeeding technique, including latch, are among the most important ingredients in minimizing breastfeeding problems. This result is corroborated with *Nanthini and Bhuvaneswari (2015) report* that proper positioning and latch technique benefit mothers because they help reduce the risk of sore and chewed nipples, bleeding nipples, raw nipples, and chafed nipples.

On testing the effect of the instructional module on improving latch score, the present study's result reveals a highly statistically significant improvement of latch score among post-cesarean section mothers at post and follow up of intervention compared to pre-intervention. This finding is supporting the third research hypothesis. These findings were incongruent with *Prasad, et al. (2017),* who found an improvement in the intervention group's latching score. This result is corroborated with the report of *Cotterman (2004),* who stated that proper positioning and latch technique benefits the mother because they help reduce the risk of sore and chewed nipples, bleeding nipples, raw nipples, and chafed nipples.

Contrary to our study findings, a study was done by *Kaur et al. (2015),* who performed a comparative intervention study to examine the effectiveness of intervention program on breast engorgement and pain among 60 postnatal mothers at Ludhiana, Punjab, and revealed no significant differences between two groups pre and post-intervention, these differences among these studies results may be due to variation in methods of implementation and also differences in subjects characteristics.

The present study emphasized important evidence concerning the remarkable effect of instructional modules on breast problems among post-cesarean section mothers. The study confirmed a significant reduction in the degree of breast pain, breast engorgement, and nipple trauma. Also, there was a highly significant improvement in latching scores among postnatal mothers. This finding emphasized the importance of such education using the instructional module on enhancing and promoting many health-related problems that may arise for almost many women during the postpartum period and decreasing undesired consequences of these problems on woman health and welfare as well as promoting the golden and secret role of the nurse as an educator in raising community awareness and enhancing individual quality of life.

7. Conclusion

The study concluded that; there was a highly statistically significant improvement in the mothers' total self-care practices score regarding breast problems after the intervention. In addition to a significant reduction of breast problems among post-cesarean mothers after implementing the instructional module, reduce the degree of pain and breast engorgement, nipple trauma, and an improvement in latching score among post-cesarean section mothers. The findings of the current study proved and supported the research hypotheses.

8. Recommendations

In light of previous study findings, the current study recommended:

- Educational programs regarding breast problems and their related management should be included as standard care components for post-cesarean women.
- Developing counseling programs for women during pregnancy about breastfeeding and lactation-related problems.
- Establishing an education center at the postnatal inpatient unit in the hospital to facilitate the follow-up of cases.
- Further studies are needed to assess the prenatal education program's effect on women's practice for the prevention of breastfeeding problems after cesarean delivery.

9. References

Abdallah, A. N. M., Nour El dein, 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. https://ijpras.com/storage/models/article/PHY3NwWWpq0hJPCG0sykmElE4wnxy2Rpz9vmcwUy25fMMSHKNSKM8pZPYO7b/breast-and-nipple-problems-encountered-among-puerperal-primipara-women-in-zagazig.pdf.

Abou-Dakn, M., Fluhr, J .W., Gensch, M., & Wöckel, A., (2011). Positive effect of HPA lanolin versus expressed breastmilk on painful and damaged nipples during lactation, *Skin Pharmacol Physiol., 24*(1), 27-35. https://doi.org/10.1159/000318228.

Altuntas, N., Turkyilmaz, C., Yildiz, H., Kulali, F., Hirfanoglu, I., Onal, E., Ergenekon, E., Koç, E., & Atalay, A. (2014). Validity and reliability of the infant breastfeeding assessment tool, the mother-baby assessment tool, and the LATCH Scoring System. *Breastfeed Med. 9*(4), 191-5. https://doi.org/10.1089/bfm.2014.0018.

Berens, P. D. (2015). Breast pain: Engorgement, nipple pain, and mastitis. *Clinical Obstetrics and Gynecology.*

58(4), 902–914. https://doi.org/10.1097/grf.0000000000000153.

Chung, W. H., Kong, C. W., & To, W. W. (2017). Secular trends in cesarean section rates over 20 years in a regional obstetric unit in Hong Kong. *Hong Kong Med J; 23*(4), 340-8. https://doi.org/10.12809/hkmj176217.

Cotterman, J., (2004). Reverse pressure softening: A simple tool to prepare areola for easier latching during engorgement. *Journal of Human Lactation; 20*(2), 227-237. https://doi.org/10.1177/0890334404264224.

Deshmukh, V., Rasool, U. G., Kalyankar, B., Gaikwad, R., & Yelikar, K. (2016). Knowledge, attitude and practice of breastfeeding at a tertiary care center in the government medical college and hospital, Aurangabad, India, Journal *of reproductive, contraceptive, obstetrics and gynecology; 5(*6), 1912-1915. https://doi.org/10.18203/2320-1770.ijrcog20161689.

Dinardo, J. (2008). *Natural experiments and quasi-natural experiments. The New Palgrave Dictionary of Economics.* Pp. 856–859. https://doi.org/10.1057/978-1-349-95121-5_2006-1**.**

Ding, T., & Luo, B. R. (2019). Effect of individualized intervention on postpartum breastfeeding behavior after cesarean section, *Journal of Sichuan University, 50*(4), 609-614. https://europepmc.org/article/med/31642244.

Ebrahim, R. M., & Esmat, O. M. (2018). Effect of educational program on mothers' using for non-pharmacological therapies to alleviate breast engorgement after cesarean section, *International Journal of Novel Research in Healthcare and Nursing; 5* (2), 454-469. https://www.noveltyjournals.com/upload/paper/Effect%20of%20Educational-1464.pdf.

El Saidy, T. M., & Aboushady, R. M. (2016). Effect of two different nursing care approaches on the reduction of breast engorgement among postnatal women, *Journal of Nursing Education and Practice; 6* (9), 18-28. https://doi.org/10.5430/jnep.v6n9p18**.**

Folami, F., Ademuyiwa, Y., & Olowe A. (2018). The effectiveness of nursing intervention on breastfeeding-related problems among nursing mothers in selected primary health clinics in Lagos, *Nigeria, Arch Nurs Pract Care; 4*(1), 014-019. https://doi.org/10.17352/2581-4265.000034.

Gertosio, C., Meazza, C., Pagani, S., & Bozzola, B. (2016). Breastfeeding and its gamut of benefits, *Minerva Pediatrica; 68* (3), 201-212. https://www.researchgate.net/publication/303431896_Breastfeeding_and_its_gamut_of_benefits**.**

Gubler, T., Krähenmann, F., Roos, M., & Zimmermann. R. (2013). Determinants of successful breastfeeding initiation in healthy term singletons: A Swiss university hospital observational study, *J Perinat Med; 41*(3), 331-353. https://doi.org/10.1515/jpm-2012-0102.

Hill, PD (2008). Six-point breast engorgement scale. Retrieved April 7, 2008, from http://www.whitlestone.com.

Hobbs, A .J., Mannion, C. A ., Macdonald, S .W., Brockway, M., & Tough, S. C. (2016). The impact of cesarean section on breastfeeding initiation duration and difficulties in the first four months postpartum. *BMC pregnancy childbirth, (26)* 16, 90. https://doi.org/10.1186/s12884-016-0876-1.

Indrani D., Sowmya M. (2019). A Study to find the prevalence of breast engorgement among lactating mothers HSOA, Journal *of Reproductive Medicine, Gynaecology & Obstetrics;* 4, 023. https://doi.org/10.24966/RMGO-2574/100023**.**

Iowa State University of Science and Technology. (2020). Research methodologies guide (quasi-experimental design). Available at: https://instr.iastate.libguides.com/researchmethods.

Kaur, A., Sagar, N., Kaur, J., & Jindal, P. (2015). Comparative intervention study to assess the effectiveness of alternative hot and cold compresses VS. cabbage leaves on breast engorgement and pain among postnatal mothers, International *Journal of Current Research; 7* (3), 14000-14002. https://www.journalcra.com/article/comparative-interventional-study-assess-effectiveness-alternative-hot-and-cold-compresses-vs**.**

Karlström, A., Engström-Olofsson, R., Norbergh, K., Sjöling, M., & Hildingsson, H. (2007). Postoperative pain after cesarean section birth affects breastfeeding and infant care, *journal of obstetric, gynecologic neonatal nursing; 36*(5), 430-440. https://doi.org/10.1111/j.1552-6909.2007.00160.x.

Kavle, J. K., LaCroix, E., Dau, H., & Engmann, C. (2017). Addressing barriers to exclusive breastfeeding in low- and middle-income countries: A systematic review and programmatic implications*, Public Health Nutrition 20*(17), 3120-3134. https://doi.org/10.1017/S1368980017002531.

Khuanbai, Y. (2019). Re: Calculation of sample size. Retrieved from: https://www.researchgate.net/post/Calculation_of_Sample_Size/5deb25caf8ea52201008c327/citation/download.

Kuguoglu, S., Yildiz, H., Tanir, M. K., & Demirbag, B. G. (2012). Breastfeeding After a Cesarean Delivery, *Cesarean Delivery*, 122- 129. https://doi.org/10.5772/31090.

Mızrak, B., Ozerdoğan, N., & Colak, E. (2017). The effect of antenatal education on breastfeeding self-efficacy: Primiparous Women in Turkey. *International Journal of Caring Sciences; 10* (1), 503-515. https://www.semanticscholar.org/paper/The-Effect-of-Antenatal-Education-on-Breastfeeding-M%C4%B1zrak-Ozerdo%C4%9Fan/a7514c5efa25c9c7131433a5ebe5dba4ebf0ce85.

Ministry of Health and Population, Egypt. (2020). Management protocol for COVID 19 patients. Version 1.4/November 2020. www.mohp.gov.eg. http://www.mohp.gov.eg/JobsDetails.aspx?job_id=3061

Mohan, C. (2018). Assessment of knowledge regarding exclusive breastfeeding among primigravida and primi Para mothers, *International Journal of Advanced Research and Development, 3*(8), 1-36. https://www.ijarnd.com/manuscripts/v3i8/V3I8-1155.pdf.

Mostafa, E. E., Mohamed, H. A., & Abu-talib Y. M. (2015). Evidence-based guideline using to alleviate traumatic nipple among nursing mothers, *World Journal of Nursing Sciences; 1* (3), 35-44. https://doi.org/10.5829/idosi.wjns.2015.1.3.93201.

Nanthini R., & Bhuvaneswari, G. (2015). A study to assess the effectiveness of cold cabbage leaves vs hot water application on breast engorgement among postnatal mothers in selected hospital, Chennai, *International Journal of Science and Research; 4* (9), 838-842. https://www.ijsr.net/archive/v4i9/SUB158152.pdf.

Posternak, M. A., & Miller, I. (2001). Untreated short-term course of major depression: A meta-analysis of studies using outcomes from studies using wait-list control groups. *Journal of Affective Disorders, 66*(2-3), 139–146. https://doi.org/10.1016/s0165-0327(00)00304-9.

Prasad, Y. R., Chandrakala, P., & Manasa G., (2017). Common breastfeeding problems in mothers in the early postnatal period, *International Journal of Contemporary Pediatrics;4*(2), 625-628. https://doi.org/10.18203/2349-3291.ijcp20170721**.**

Shinde, E. (2015). Breastfeeding and use of education program for its improvement in Nashik, Maharashtra, India: *A mini-review International Journal of Nursing Research. 1* (1), 123-127. http://www.innovationalpublishers.com/Journal/ijnr/Search?term=Ekta%20Shinde.

Shrooti, S., & Dhakal, P. (2016). Knowledge and practice related to breastfeeding among caesarean section mothers of BPKIHS, Dharan, Nepal*. Int J Health Science Res.6* (1), 213-218. https://www.ijhsr.org/IJHSR_Vol.6_Issue.3_March2016/33.pdf.

Spurlock D. R. Jr. (2018). The single-group, pre-and post-test design in nursing education research: It is time to move on. *J Nurs Educ, 57*(2), 69-71. https://doi.org/10.3928/01484834-20180123-02.

Thomas, J. V. (2016). Barriers to Exclusive Breastfeeding among Mothers during the First Four Weeks Postpartum. *Walden Dissertations and Doctoral Studies.15-55.* https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=3300&context=dissertations.

Victora C. G., Bahl R., Barros A., França, G. V. A., Horton, S., Krasevec, K., Murch , S., Sankar, M. J., Walker , H., & Rollins, N. C. (2016). Breastfeeding in the 21st century: Epidemiology, mechanisms, and lifelong effect. *Lancet; 387*(30), 475–490. https://doi.org/10.1016/S0140-6736(15)01024-7.

World Health Organization and UNICEF, (2009). Baby-friendly hospital initiative: Revised, updated, and expanded for integrated care: The global criteria for the BFHI. https://www.ncbi.nlm.nih.gov/books/NBK153487/.

World Health Organization, (2017a). National implementation of the baby-friendly hospital initiative, Geneva. https://apps.who.int/iris/bitstream/handle/10665/255197/9789241512381-eng.pdf?sequence=1**.**

World Health Organization Guideline (2017b). Protecting, promoting, and supporting breastfeeding in facilities providing maternity and newborn services. https://www.who.int/nutrition/publications/guidelines/breastfeeding-facilities-maternity-newborn/en/.

World Health Organization. Nutrition (2016). Exclusive breastfeeding for optimal growth, development, and health of infants. *e-Library of Evidence for Nutrition Actions (eLENA)* https://www.who.int/elena/titles/exclusive_breastfeeding/en/**.**

World Health Organization., (2020). Coronavirus disease (COVID-19)/ Advice for the public. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public.