

Effect of Almond Oil Breast massage on Breast Milk Secretion among Post Natal Mothers after Cesarean Section.

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Abstract:

Background: Cesarean Section is a surgical intervention, which is performed to guarantee the safety of mother and her baby when vaginal delivery is not feasible. Delayed breastfeeding initiation and increased challenges with breastfeeding in women with cesarean section may be linked to the physiologic effect on lacto-genesis. Almond oil is used in complementary medicine spheres for its many health advantages. Almond oil massage over the breast with the goal of improving health promotes relaxation and clears the breast ducts which in turn enhance lactation in breastfeeding mothers. **Objective:** This study aimed to determine the effect of almond oil breast massage on breast milk secretion among post-natal mothers after cesarean section. **Design:** A quasi-experimental research design was utilized in this study. **Setting:** The study was conducted at the postnatal unit at Damanshour Medical National Institute. **Subjects:** a convenient sample of 80 postnatal mothers to whom cesarean sections had been performed and fulfilled the inclusion criteria were selected from the previously mentioned setting. **Tools:** Three tools were used for data collection. **The first tool** was basic data structured interview schedule to identify women's socio-demographic data, reproductive history, information about the current pregnancy and birth, breastfeeding history and information about breastfeeding. **The second tool** was the breast milk adequacy questionnaire. **The third tool** was a UNICEF- based breast feeding assessment. **Results:** On measuring the total score of breast milk adequacy on the 4th day before intervention, and on the 5th day after intervention. All subjects (100%) of the study and the control groups had inadequate breast milk secretions before intervention on the 4th day. While the majority (80% & 87.5%) of the two groups, respectively, had moderate breast milk secretions after intervention on the 5th day. A highly statistically significant difference was found between the two groups in relation to the adequacy of breast milk secretion on the 8th day after intervention for the favor of study group where ($P=0.000$). **Conclusion:** Application of almond oil breast massage seems to be effective in increasing breast milk secretion among postnatal mothers after cesarean sections. **Recommendations:** Encourage in-service training programs for nurses in postpartum units about the utilization of non- pharmacological approaches especially using almond oil breast massage to increase breast milk secretion.

Key words: almond oil breast massage, breast milk secretion, cesarean section women.

Introduction

Although cesarean section (CS) surgery is potentially considered as one of the leading causes of breastfeeding failure. Yet, it is a

crucial life-saving procedure, whenever vaginal birth puts a woman or child in danger. The Pan American Health Organization (PAHO) and the World Health Organization (WHO) recommended that the best CS rate for a country should range from 5% to 15%.

However; the frequency of CS has been rising in both developed and developing countries. Cesarean sections now outnumber vaginal births in five countries: the Dominican Republic, Brazil, Cyprus, Egypt, and Turkey (Elzahaf & Ajroud, 2018).

Although CS is effective in saving lives of parturients and perinatal infants, it comes with challenges, one of which is breastfeeding. Delayed breastfeeding initiation and increased challenges with breastfeeding in women with CS deliveries may be linked to the physiologic effect on lacto-genesis. Mother/baby separation, decreased infant receptivity, poor suckling ability and insufficient milk production are linked to delayed breastfeeding initiation accompanying CS delivery. It is hypothesized that the hormonal pathway that stimulates lacto-genesis is disrupted by CS delivery, either from decreased oxytocin secretion release or maternal stress which can impair milk production (Hobbs, Mannion, McDonald, Brockway, & Tough, 2016).

Significantly, insufficient milk production is often considered as an outstanding barrier for initiation and early cessation of breastfeeding. Many mothers worry about not producing enough milk for feeding their babies, which consequently affect the decision to breastfeed. Insufficient milk supply is referred to as a state in which the mother feels that her breast milk supply is insufficient to either satiate and/or support adequate weight gain for the infant. Insufficient milk supply makes mothers feel unsuccessful with breastfeeding and mothering, and thus lead to early stopping of breastfeeding (Kent et al., 2021).

Many pharmacological and non-pharmacological methods to enhance breast milk supply in lactating mothers are utilized. Pharmacological methods include medications such as Metoclopramide and Domperidone. However, such methods can cause adverse

effects on the mother and infant. Non-pharmacological methods used to promote breast feeding and increase breast milk include the use of fenugreek, blessed thistle, fennel, and applying breast massage with almond oil (Bettiol et al., 2018).

Almond oil is used in complementary medicine spheres for its many health advantages. Almonds and almond oil have many benefits including immunity-boosting, anti-inflammatory and anti-hepatotoxicity effects. It is an excellent moisturizer and lubricant, which prevents the skin from drying and peeling. It contains high concentration of Oleic and linoleic essential fatty acids. In addition, almond oil can be used as a massage oil to promote milk secretions. Combining almond oil with breast massage is the suggested way to increase management efficacy (Mohamed, 2016).

Almond oil massage is a form of herbal traditional medicine which enhances mothers' milk by enhancing the secretion of prolactin hormone. Almond oil massage over the breast with the goal of maintaining health promotes relaxation and clears the breast ducts which in turn enhances lactation in breastfeeding mothers. Almond oil breast massage has the ability to induce a relaxed state in the body which helps postpartum mothers with milk production (Anusha, 2015).

Aim of the study

The present study aims to:

Determine the effect of almond oil breast massage on breast milk secretion among postnatal mothers after cesarean section.

Research hypothesis:

Postnatal mothers after cesarean section who apply almond oil massage to their breasts

exhibit an increase in the secretion of breast milk than those who do not apply it.

Materials and Method

Materials:

Research design:

Quasi-experimental research design was utilized in this study.

Setting:

This study was conducted at the postnatal unit at Damanhour Medical National Institute.

Subjects:

The study subjects were selected from the above mentioned setting by using the non-probability sampling technique, where a convenient sample of 80 postnatal mothers to whom cesarean section had been performed according to Epi-info statistical program.

The subjects were selected according to the following inclusion criteria:

1. Post-natal mothers undergone CS
2. Mothers with single & appropriate weight for gestational age newborn.
3. Mothers whose newborns were full term with normal reflexes.
4. Mothers with normal breast nipples.
5. Mothers without chronic illness as diabetes and thyroid disorders (as confirmed by the mothers' clinical record).
6. Mothers who had deficient breast milk secretion according to the results of breast milk adequacy questionnaire.
7. Mothers who were willing to breast feed their newborns.

The subjects were divided into two equal groups, study group (40) and control group (40).

Tools of data collection

Three tools were used for data collection

Tool I: Post-natal mothers' basic data structured interview schedule.

This tool was developed and used by the researcher to collect basic data of the study subjects. It included five parts:

Part I: Socio-demographic characteristics such as age, level of education, occupation, religion, marital status, current residence, type of family and family income.

Part II: Reproductive history i.e. gravidity, parity, number of abortions, and number of living children& stillbirths.

Part III: Information about the current pregnancy and birth such as attendance of antenatal care, information received about breastfeeding during antenatal care, type of anesthesia, analgesia, antibiotics, and initiation of breastfeeding after giving birth.

Part IV: Breastfeeding history, such as breast feeding of previous children, reasons for not breastfeeding, dealing with breastfeeding problems, adequacy of breast milk in the first ten days after birth, and methods used to increase milk production.

Part V: Information about breastfeeding: It comprised 14 questions to assess mothers' knowledge about breastfeeding. The answers of 12 questions were scored as correct and complete =2, correct and incomplete =1, and incorrect or don't know= 0. The answers to the remaining 2 questions were scored as yes =1 and no= 0. The answers of all questions were scored and summed together; the total score was 26 categorized as follows:

- Poor knowledge less than 13
- Satisfactory knowledge from 13 to less than 20

- Good knowledge from 20 to 26

Tool II: breast milk adequacy questionnaire:

This tool was adapted from Anusha (2015) to check milk adequacy before and after intervention . It consists of 20 questions concerning breast milk secretion. One of 2 responses was required. One mark was donated for the (yes) response and zero mark was donated for the (no) response. And the total score was classified as follows:

- Adequate breast milk secretion 14 – 20
- Moderate breast milk secretion 7 – 13
- Inadequate breast milk secretion 1- 6

Tool III: UNICEF based breast feeding assessment:

This tool was adapted by researcher then translated into Arabic language. UNICEF has developed a breastfeeding assessment tool to assess the adequacy of breast milk by assessing the condition of breasts and nipples, color of the newborn, percentage weight loss of newborn, urinary output per day, stool frequency per day, number of feeds in 24 hours, behavior of the newborn during and after feeds etc. Breastfeeding assessment tool consists of 15 questions with responses scored from 1-5 (UNICEF, UK 2010). The total score obtained from the 15 questions was 75 score which are classified as follows:

- Inadequate breast milk secretion: 15-35
- Moderate breast milk secretion: 36-55
- Adequate breast milk secretion: 56-75

Method:

1. An approval from Research Ethics Committee, Faculty of Nursing- Alexandria University, was obtained.
2. The researcher attended a training program on therapeutic massage for 3

days (18 hours) at the Arab African Union, Supreme Body for Complementary Medicine affiliated to the Ministry of Culture and Investment in Alexandria governorate. An accredited certificate was obtained.

3. An official letter from the vice-dean of the graduate studies Faculty of Nursing, Alexandria University was submitted to the responsible authorities of the study setting to obtain their permission to conduct the study and collect data after explanation of the research purpose.

4. Sweet almond oil was prepared by (IMTENAN COMPANY) for natural oils. It was extracted from (*Prunus amygdalus* var. *dulcis*), then it was dried and pressed, then the oil was left standing for several days so that the mucilage settles to the bottom and can be separated using filter presses. The recommended concentration of oil should be 3-10% (Bährle-Rapp, 2007).

5. Tools development phase

- Tool (I) was developed and used by the researcher after extensive review of relevant and recent literature for the last two parts (IV and V) (Anusha, 2015).
- Tool (II) was adapted to check milk adequacy before and after intervention.
- Tool (III) was adapted then translated into Arabic language and back to English to assess milk adequacy during follow-up visits.
- Tools were tested for content validity and applicability by a jury of (5) experts in the field of obstetric and gynecological nursing. Their suggestions and recommendations were taken into consideration.

- The reliability of the tools was tested using the Cronbach's alpha test for tools one (parts IV, V) two and three where $r = (0.788, 0.882, 0.778)$ respectively and the results were highly reliable).

6. A pilot study was carried out on 8 post-partum women (10% of sample) (excluded from the main study sample) from the previously mentioned setting to assure feasibility of the study, clarity and applicability of the tools.

7. Selection of the study subjects: The researcher recruited participants who fulfilled the criteria of selection from the postnatal unit at Damanhour Medical National Institute.

8. Intervention phase: The study was proceeded as follows: After selecting the study subjects:

- The participants were given an appropriate explanation about the purpose of the study and the subject's role.
- The researcher established rapport with the subjects and obtained their telephone and/ or mobile numbers (contact information) and also provided them with the researcher's contact.
- Each subject was individually interviewed by the researcher after explaining the purpose of the study. An informed written consent was obtained. The eligible post-natal mothers were assigned to either the study (40) or the control group (40).
- The researcher interviewed the mothers and collected the socio-demographic and clinical data using tool (I) from the two groups at the postnatal unit.

A- For the study group:

- Both breasts (nipples and areola) were cleaned with warm water.
- After delivery, mothers of this group were taught how to perform breast massage with almond oil 15 minute before feeding (proper technique of breast feeding was stressed as well as adequate fluid intake). The researcher demonstrated the procedure to each mother, and then asked the mother to re-demonstrate it.

B- For the control group:

- After delivery, mothers of the control group were taught how to perform breast massage exactly like the study group without almond oil (proper technique of breast feeding was stressed as well as adequate fluid intake). The researcher demonstrated the procedure to each mother, and then asked the mother to re-demonstrate it.
- On the 4th day after delivery (during which breast milk flow normally occurs), tool II was used to assess the breast milk adequacy for the two groups before the intervention (pre-test) through phone call.
- On the fifth day of delivery, post-test was carried out for the two groups using tool II.

2. Evaluation phase: it included follow up data:

- For both groups, follow-up was conducted by the researcher at the 6th and 8th day after delivery through phone calls, in order to assess breast milk adequacy using tool III.
- This follow-up was carried out by phone calls twice a day.

The effect of almond oil breast massage (independent variable) on breast milk secretion among post-natal mothers after cesarean section (dependent variable) was determined by comparing the adequacy of breast milk production between the two groups before and after intervention.

Statistical analysis:

Collected data were categorized, coded, computerized, tabulated and analyzed using statistical package for social science (SPSS) version 16. The necessary tables were then prepared.

Ethical considerations:

For each recruited subject, the following issues were considered:

1. Written informed consent was obtained from women before data collection and after explanation of the study aim.
2. Keeping the subject's privacy.
3. Assuring confidentiality of the collected data.
4. The subject's voluntary participation and their right to withdraw from the study at any time were emphasized.
5. If any side effect or negative reaction occurs, discontinuation was strictly considered.

Results:

Table (I) elaborates number and percent distribution of the postnatal mothers according to their socio - demographic characteristics. Concerning age, it was found that more than one half (55%) & more than three fifth (62.5%) of the study and control groups respectively were 20 to less than 30 years old. As regards level of education, the table reveals that more than one half (55%) of the study group had

secondary education or its equivalent, compared to more than two fifth (42.5%) of the control group. In relation to occupation, obviously most of the study and the control groups (97.5% & 92.5) respectively were housewives. There was no statistically significant difference between the two groups in relation to their age, level of education, occupation, marital status, current residence, and family income where, $P = (0.852, 0.178, 0.615, 1.000, 0.066, \& 0.209, \text{ respectively})$.

Figure (1) represents percent distribution of postnatal mothers' according to number of follow-up visits during their current pregnancy. It was observed that the majority of the study and the control groups (87.5% & 85% respectively) had 4 or more visits. Meanwhile, 12.5% & 15% of the two groups had less than 4 visits. There was no statistically significant difference between the two groups in relation to their number of antenatal follow up visits during the current pregnancy where, $P = (0.745)$

Table (II) portrays the number and percent distribution of postnatal mothers according to their total score of knowledge about breastfeeding. Nearly three quarter (72.5% & 70%) of the study and the control groups, respectively had satisfactory knowledge about breastfeeding, compared to more than one quarter (27.5% & 30%) of them, respectively who had poor knowledge. No statistically significant difference was observed among the two groups in relation to their total score of knowledge about breastfeeding where, $P = 0.805$.

Table (III) reflects number and percent distribution of post-natal mothers according to their total score of breast milk adequacy on the 4th day before intervention and on the 5th day after intervention. All subjects (100%) of the study and the control groups had inadequate breast milk secretions before intervention on the 4th day. While the majority (80%, & 87.5%) of

the two groups respectively, had moderate breast milk secretions after intervention on the 5th day.

No statistically significant difference was found between the two groups regarding the total score of breast milk adequacy before intervention on the 4th day and after intervention on the 5th day.

Table (IV) shows number and percent distribution of postnatal mothers according to their total score of UNICEF based breast feeding assessment follow-up. No statistically significant difference was found regarding adequacy of breast feeding between the two groups, where ($p=0.130$) on 6th day of intervention. However, on the 8th day after intervention, it was found a highly statistically significant difference was found between the two groups in relation to adequacy of breast milk secretion on the 8th day after intervention, where ($P=0.000$).

Discussion

According to the study findings, there was no statistically significant difference between the study and the control groups in relation to breast milk secretion on the 4th day before intervention. Where, all of the two groups reported inadequate breast milk secretion. This was not unexpected since breast milk insufficiency or lactation deficiency is generally looked at as normal phenomena during this time postnatally.

However, on the 5th day after intervention, there was a moderate increase in breast milk secretion among both the study and control groups, but still with no statistically significant difference between the two groups in breast milk adequacy, where $p= (0.395)$. Again, on the 6th day after intervention, there was no discernible statistically significant difference between the two groups regarding adequacy of breast milk, where $p= (0.130)$. On the other hand, by the 8th day after intervention assessment of breast milk adequacy revealed a

highly statistically significant difference between the study and the control groups, in favor of the study group, where ($P=0.000$). This implies that applying almond oil breast massage was probably more useful in improving breast milk adequacy. The positive effect of almond oil breast massage on breast milk secretion was documented by researchers as well as by the literature. These references cited that massaging the breast three times per day for five days was very effective in increasing breast milk secretion since it enhances prolactin production from the anterior pituitary gland and oxytocin from posterior pituitary gland.

This finding is consistent with the literature, which suggests that almond oil rich in galactogogues interacts with the dopamine system in such a way to increase prolactin production, specifically by blocking the dopamine 2receptor. The majority of research on almond oil indicates that massaging with it promotes the production of breast milk (Neelofer, 2021; Londhe & Bhore, 2022).

Many studies were conducted worldwide aiming at providing timely and appropriate evidence- based results to support the unique beneficial effect of almond oil in promoting breast milk production

The 1st study, which added conformity to the current study results, was that of **Bhatt (2022) in India**, who investigated "the effect of almond oil massage on promotion of breast milk secretion among LSCS Mothers" The study showed that the majority of the study group had adequate breast milk secretion after intervention, therefore it was concluded that almond oil breast massage substantially increased breast milk secretion.

The 2nd study, was also consistent with the results of the present study was that of Londhe

and Bhore (2022), whose research was in **India** to verify "the effect of almond oil massage on breast feeding adequacy among postnatal mothers who were subjected to lower cesarean sections (LSCS)". They concluded that massaging the breasts with 2 ml of almond oil has been found to be an effective breastfeeding intervention for raising breast milk production.

Conclusion: it can be concluded that:

- The research hypothesis is accepted: where the postnatal mothers after cesarean section who apply almond oil massage to their breasts exhibited an increase in the secretion of breast milk than those who do not apply it.

Recommendations:

Concerning the results of the present study, the following recommendations are included:

1. Almond oil breast massage can be incorporated as an intervention for the care of postnatal mothers to increase breast milk secretion.

2. Encourage in service training programs for nurses in postpartum units about the utilization of non- pharmacological approaches especially using almond oil massage to increase breast milk secretion.
3. The curricula of basic nursing education as well as continuing education can be enriched with correct and relevant evidence about the non- pharmacological management of almond oil breast massage.
4. Dissemination of knowledge through mass media about complementary therapies especially different uses of almond oils during postnatal period.

Future studies:

1. Replication of the present study among different Egyptian cultures such as Upper Egypt or rural areas at different settings.
2. A comparative study can be conducted to assess the effectiveness of almond oil breast massage against other essential oils on breast milk secretion.

Table (I): Number and percent distribution of postnatal mothers according to their socio - demographic characteristics

Socio - demographic characteristics	Study Group (n=40)		Control Group (n=40)		FET / χ^2 (P)
	No	%	No	%	
Age (years):					
• Less than 20	2	05.0	2	05.0	0.950 (0.852)
• 20 -	22	55.0	25	62.5	
• 30 -	9	22.5	6	15.0	
• 35 and more	7	17.5	7	17.5	
Mean \pm SD	28.600 \pm 7.099		27.825 \pm 5.961		T-test (P) 0.529 (0.598)
Level of education:					
- Illiterate/read and write.	5	12.5	8	20.0	4.917 (0.178)
- Primary & preparatory	5	12.5	11	27.5	
- Secondary or its equivalent	22	55.0	17	42.5	
- University	8	20.0	4	10.0	
Occupation:					
- Housewife	39	97.5	37	92.5	1.053 (0.615)
- Working	1	02.5	3	7.5	
Religion					
- Muslim	40	100	40	100	-
Marital status:					
- married	39	97.5%	40	100.0	1.399 (1.000)
- divorced	1	2.5%	0	00.0	
Current residence:					
- Urban	13	32.5	6	15.0	3.382 (0.066)
- Rural	27	67.5	34	85.0	
Type of family:					
- Nuclear	22	55.0	12	30.0	5.115 (0.024) *
- Extended	18	45.0	28	70.0	
family income					
- Enough and more	14	35.0	7	17.5	MCE (P=0.209)
- Enough	12	30.0	12	30.0	
- Barely enough	14	35.0	20	50.0	
- Not enough	0	00.0	1	02.5	

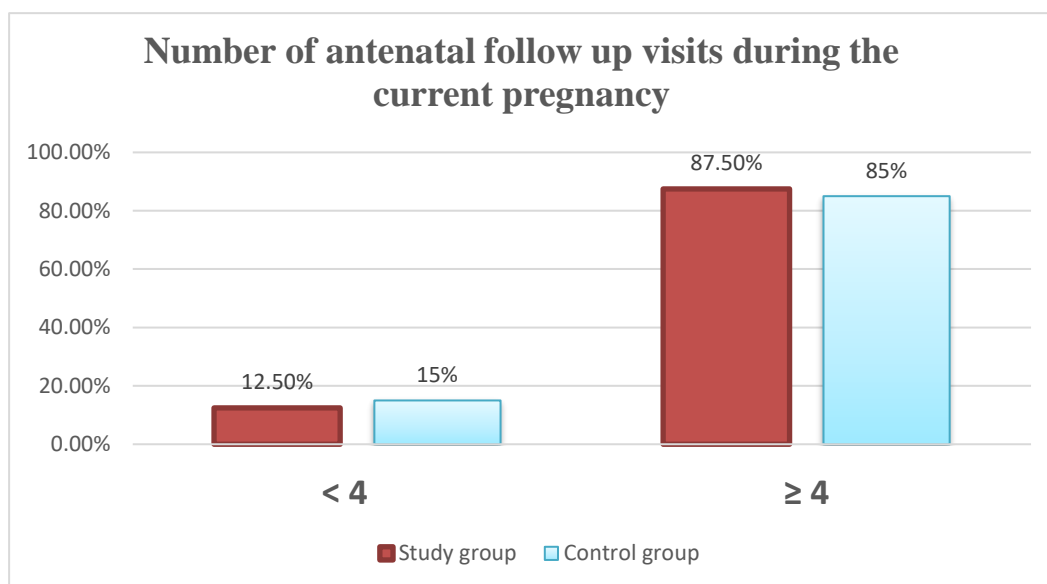


Figure (1): Percent distribution of postnatal mothers according to number of antenatal follow-up visits during their current pregnancy

Table (II): number and Percent distribution of postnatal mothers according to their total score of knowledge about breastfeeding

Total score of knowledge about breast feeding	Study Group (n=40)		Control Group (n=40)	
	No	%	No	%
- Poor knowledge	11	27.5	12	30
- Satisfactory knowledge	29	72.5	28	70
$\chi^2(P)$	0.061(0.805)			

Table (III): Number and percent distribution of post-natal mothers according to their total score of breast milk adequacy on the 4th day before intervention and on the 5th day after intervention

Total score of breast milk adequacy before and after intervention	Before intervention on the 4 th day				After intervention on the 5 th day			
	Study Group (n=40)		Control Group (n=40)		Study Group (n=40)		Control Group (n=40)	
	No	%	No	%	No	%	No	%
- Adequate breast milk secretion	0	0.00	0	0.00	7	17.5	5	12.5
- Moderate breast milk secretion	0	0.00	0	0.00	32	80.0	35	87.5
- Inadequate breast milk secretion	40	100.0	40	100.0	1	2.	0	0.00
FET / χ^2 (P)	-				1.418 (0.395)			

Table (IV): Number and percent distribution of postnatal mothers according to their total score of UNICEF based breast feeding assessment follow-up

Total score of UNICEF based breast feeding assessment	Study Group (n=40)		Control Group (n=40)		FET / χ^2 (P)
	No	%	No	%	
6 th day after intervention :					
- Moderate breast milk secretion	31	77.5	36	90.0	2.296 (0.130)
- Adequate breast milk secretion	9	22.5	4	10.0	
8 th day after intervention:					
- Moderate breast milk secretion	6	15.0	27	67.5	22.747 (0.000)*
- Adequate breast milk secretion	34	85.0	13	32.5	

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