

Effect of Olive Oil, Coconut Oil, Breast Milk on Nipple Soreness among Lactating Mothers: Comparative Study

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Abstract

Introduction: Advantages of breastfeeding are indubitable. But painful, sore nipples are upsetting for the mothers and may lead to stop nursing before the commended time. **Aim of the study:** explore the effect of olive oil, coconut oil, breast milk on nipple soreness among lactating mothers. **Methodology:** Experimental study involved 135 postpartum women visited outpatient as postpartum follow up for labor in Itay El-baroud Central Hospital and National Medical Institute of Damanhour City, Egypt. They were randomly categorized into three groups: Group 1 (using Olive oil), group 2 (using Coconut oil) and group 3 (Using breast milk). Nipple trauma score (NTS) was used to assess nipple soreness at 1st, 7th, 14th day post intervention. **Results:** there was highly significant difference between mean score of olive oil group and coconut oil group at 1st, 7th, 14th with p value <0.01. While, there was slight significant difference at breast milk group at p value <0.05. While, there was highly significant difference between mean scores of three groups at 7th and 14th day with p value <0.01. But, there was no significant difference between three groups at 1st day with p value >0.05. **Conclusion:** According to these findings, the current study detected that olive oil, coconut oil and breast milk had positive effect on management of nipple soreness, breast milk had least effect while olive oil had highest effect.

Key words: Olive oil, Coconut oil, Breast milk, Nipple soreness, lactating mother

Introduction:

Breastfeeding is skill can be learned and modified for mothers and babies and may take time and patience. In the early weeks of post partum many mothers experience some tenderness at the beginning of the breastfeed, soreness that continues throughout the feed or extends beyond the first week is not normal. Breastfeeding is one of the most effective ways to ensure child health and survival. However, nearly 2 out of 3 infants are not exclusively breastfed for the recommended 6 months—a rate that has not improved in 2 decades (Cacho & Lawrence, 2017). Breast milk is the perfect food for neonates. It is clean, safe and holds antibodies which aid protect against many common childhood diseases (Neter & Bagants, 2020).

Sore nipples are the most common breastfeeding complication and the most common reason women give up breastfeeding (Bourdillon, McCausland & Jones, 2020).

With a little breastfeeding support this can often easily be rectified. Sore nipples are very common for breastfeeding women. Prevention is possible and treatment depends on the cause, which includes; a baby not latching well, chafing, thrush and adapting to this new skill (Oliveira, Vieira, Cecilio, Guimarães & Campbell, 2020).

Coconut oil is made of rich, saturated fats which aid retain the moisture content of the skin. An all-natural, delicious smelling moisturizer that soothes and nourishes, without the risk of irritating the skin (Asadi & Kariman, 2018). Applying a coconut extract to human skin may enhance its protective barrier functions and has anti-inflammatory and antibacterial properties, Fighting candida, coconut oil was active against *Candida albicans* (*C. albicans*), suggesting it could be a treatment for candida. This may be due to the extract's barrier functions and anti-inflammatory properties. Olive is among the oldest know, olive oil contains three major antioxidants substance which are: vitamin E,

polyphenols, and phytosterols. Express a little milk or colostrum onto your nipples after nursing. In many cultures, human milk's antibacterial properties are used to treat skin irritations (*Sivarajah et al., 2020*).

Significance of the study:

Nipple soreness is a major reason why women abandon breastfeeding. Previous studies have revealed that nipple trauma occurs in 29–76% of breastfeeding mothers within the first postpartum week. Nipple soreness causes pain and discomfort, which render it difficult for the mother to continue breastfeeding. Therefore, prevention and treatment of nipple trauma during the early postpartum period are essential for successful breastfeeding (*Nakamura et al, 2018*) and averagely 80% to 90% of breastfeeding women experience the nipple pain and fissures. The important factor for successful breastfeeding is to treat this problem, to improve breastfeeding duration and exclusivity rates and to address one of the most common difficulties encountered by breastfeeding women systematically; a good understanding of nipple pain and a corresponding effective treatment is needed (*Dennis, Jackson & Watson, 2014*). Therefore the current study done to compare the effect of Olive oil, coconut oil and breast milk on treatment of sore nipple among lactating mothers

Aim of the study:

This study aimed to explore the effect of olive oil, coconut oil, breast milk on nipple soreness among lactating mothers.

Research hypothesis:

- H₁:** Olive oil and coconut oil had positive effect on nipple soreness among lactating mothers
- H₂:** Olive oil and coconut oil had high positive effect more than breast milk on nipple soreness among lactating mothers

Subjects and Methods:

Research design

A quasi-experimental research design was utilized to conduct this study. Where the groups were not randomly assigned. All women at the time of data collection was available and attain inclusion criteria included directly to the study groups. Although the pre-existing groups used to

study the effect of different treatment on nipple soreness.

Study setting

The current study was conducted in postnatal clinics at Itay El-baroud Central Hospital and National Medical Institute of Damanhour City affiliated to Ministry of Health in El-Beheira Governorate. When the women follow the outpatient clinic after delivery due to inability to initiate breast feeding and suffering from painful and sore nipple

Subjects

A purposive sample used to achieve the aim of this study. It includes 135 women who receiving postnatal care at previous mentioned setting and meet the following inclusion and exclusion criteria: Inclusion criteria women age between 18 and 45 age, Healthy Volunteers, Pregnancy weeks between 37-42 and Initiated breastfeeding. Exclusion criteria include medication applied to the nipple and maternal health condition that may interfere with breastfeeding.

Then, Allocation of samples to the three studied groups performed with use of random method each group 45 women by each women visited the outpatient clinic at Saturday and Sunday "olive oil group", at Monday and Tuesday included at "Coconut oil group" and Wednesday and Thursday included at "Brest milk group".

Sample size:

The sample size calculated based on a study carried out by **Oğuz, Işık, Güngör, Şeker & Ögretmen, 2014**. By statistical power of 85%, level of confidence (1-Alpha Error): 95%, Alpha 0.05, Beta 0.1. The sample size determine at every group 45 lactating mother. Sample size calculates using test comparing two means through **Kane SP. Sample Size Calculator. ClinCalc (Rosner, 2011)**

Tools of data collection

1st tool: Predesigned questionnaire:

1st part: Demographic characteristics: It includes age, educational level, types of family, residence, employment and income.

2nd part: Medical history: It includes parity,

mode of last delivery, obtained antenatal visits and sex of newborn

3rd part: Technique of breast feeding: It includes initiation of breastfeeding, type of feeding, method of nipple withdrawal, part of the breast introduced into the mouth, nipple type, number of breastfeeding and duration of breast feeding.

2nd tool: Nipple trauma score (NTS): Adopted from **Page, Lockwood & Guest, 2003**. It includes sex grades No skin change "0 score", Erythema or edema "1 score", Superficial damage with or without scab formation on <25% of nipple "2", Superficial damage with or without scab formation on >25% of nipple "3", Partial thickness wound with or without scab formation on <25% of nipple "4", Partial thickness wound with or without scab formation on >25% of nipple "5" and assess tool reliability by Cronbach's Alpha coefficient test was 8.27.

Methods

1. Permission: an official letter from the Faculty of Nursing was directed to the director of the responsible authorities of the study settings for earning his consent before collecting the data after explicating the study aim.

2. Tools Validity and reliability: Tool it was developed by the researchers after reviewing relevant and recent literature. Content validity was assured by a jury of 5 experts in the field of obstetric and pediatric nursing.

Tool II (NTS) was adopted from Abou-Dakn et al (2011). It is a valid and reliable as reported by Abou-Dakn et al, the testing of NTS revealed a high inter observer reliability where $r = 0.88$.

3. Pilot study: A pilot study was conducted on 15 lactating mothers with nipple trauma distributed into three groups to be five mothers for each one (who were excluded from the study sample) to test the clarity, applicability of the study tools, identification of a suitable place for interviewing women, and to detect any possible obstacles that might face the researchers

Ethical considerations:

Permission to conduct the study was obtained from the ethical committee in the Faculty of Nursing, Damanhour University with ethical code N11212019.

Each one was informed about the purpose and benefits of the study in the first part before starting the questionnaire, where every one can't be starting the questionnaire without consent to participate in data collection in the current study. The women were assured that all data was used for research purpose only and each one was informed of the rights to refuse participation in the study or withdraw at any time before completing the questionnaire with no consequences.

Field work:

This study started in the July 2019 and ended in the end of February, 2020. Assessment /planning phase: clarified aim of study to each mother, then a written consent was obtained from them and they were assured about confidentiality. Researcher told the mother about which group she was allocated. Each participant was individually interviewed in the follow up unit in order to collect the socio demographic and clinical data, breast feeding technique and assess nipple trauma score.

Implementation phase: Ongoing from the 1st day of the study in which; each participant asked to wash nipples with clean water post breastfeeding then rub affected nipple with olive oil or coconut or breast milk according to which group allocated, then keep it exposure to air until dry and continue on this intervention until 14th day.

Evaluation phase: At 7th day of study and 14th day post intervention the participants were assessed score of nipple trauma within 5 minutes by the researcher and compare it with pre intervention at 1st day.

Mothers in the three study groups received face-to-face instructions on breastfeeding techniques and breast hygiene using a simple illustrative pamphlet. The pamphlet contained simple pictures about the anatomy of the breast, breastfeeding position and infant's attachment.

- A single supply of Olive and coconut oil was given to all participants of the Olive or

coconut oil group and they were asked not to use any other medication or substance.

Statistical Design:

Computerized data entry and Statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS) version 22. Descriptive and analytical statistics were used such as number, percentage, mean and standard

deviation. Friedman test is the non-parametric alternative to the one-way ANOVA with repeated measures. It is used to test for differences between groups

- Highly significant if p value <0.0
- Significant if p value <0.05
- Insignificant if p value >0.05

Results:

Table (1): Number and percent distribution of studied groups according to their demographic characteristics (N=135)

Items	Olive oil (N=45)		Coconut oil (N=45)		Breast milk (N=45)		ANOVA test
	N	%	N	%	N	%	
Age:							
20 - <30	15	33.3	14	31.1	16	35.6	0.965
30- <40	20	44.4	19	42.2	18	40	.062
40 – 50	10	22.3	12	26.7	11	24.4	
Mean S.D	33.9±6.7		34.8±8.2		34.4±7.6		
Educational level:							
Preparatory	11	24.4	6	13.3	8	17.8	3.468
Secondary	22	48.9	18	40	16	35.6	.024*
University	10	22.3	16	35.6	20	44.4	
Higher education	2	4.4	5	11.1	1	2.2	
Residence:							
Urban	19	42.2	27	60	28	62.2	3.069
Rural	26	57.8	18	40	17	37.8	.021*
Employment:							
Employee	30	66.7	28	62.2	31	68.9	1.202
Unemployed	15	33.3	17	37.8	14	31.1	.054
Income:							
Enough	19	42.2	20	44.4	18	40	1.147
Not enough	26	57.8	25	55.6	27	60	.056
Type of family:							
Nuclear	17	37.8	18	40	19	42.2	1.035
Extended	28	62.2	27	60	26	57.8	.061

Table (1) clarified that there was no significant difference between three studied groups related age, employment, income and type of family at p value >0.05. Meanwhile, there was slight significant difference between them related educational level, residence at p value <0.05.

Table (2): Number and percent distribution of studied groups according to their obstetrics history (N=135)

Items	Olive oil (N=45)		Coconut oil (N=45)		Breast milk (N=45)		ANOVA test
	N	%	N	%	N	%	
Parity:							
Primipara	14	31.1	16	35.6	15	33.3	0.989
Multipara	31	68.9	29	64.4	30	66.7	.072
Mode of last delivery:							
Vaginal	33	73.3	30	66.7	31	68.9	1.136
C. S	12	26.7	15	33.3	14	31.1	.051
Obtained Antenatal visits:							
Yes	32	71.1	33	73.3	31	68.9	0.884
No	13	28.9	12	26.7	14	31.1	.083
Sex of newborn:							
Male	19	42.2	27	60	23	51.1	4.051
Female	26	57.8	18	40	22	48.9	.011*

Table (2) revealed that there was no significant difference between three studied groups related parity, mode of last delivery and antenatal visit at p value >0.05. But, there was slight significant difference between three studied groups related sex of newborn at p value <0.05.

Table (3): Number and percent distribution of studied groups according to technique of breast feeding (N=135)

Items	Olive oil (N=45)		Coconut oil (N=45)		Breast milk (N=45)		ANOVA test
	N	%	N	%	N	%	
Initiation of breastfeeding:							
-within 1st hour	10	22.2	14	31.1	9	20	2.696 .042*
-1 – 5 hours	13	28.9	19	42.2	17	37.8	
-During 1 st day	22	48.9	12	26.7	19	42.2	
Type of feeding:							
-On demand	26	57.8	20	44.4	16	35.6	1.989 .048*
-Scheduling	19	42.2	25	55.6	29	64.4	
Part of the breast introduced into the mouth							
-Nipple only	19	42.2	17	37.8	18	40	0.863 .072
-Nipple and part of areola	11	24.5	13	28.9	14	31.1	
-Nipple and all areola	15	33.3	15	33.3	13	28.9	
Method of nipple withdrawal:							
-Pulling from the infant's mouth	22	48.9	24	53.3	23	51.1	1.005 .060
-Infant leaves it spontaneous	23	51.1	21	46.7	22	48.9	
Nipple Type:							
-Protrusive	19	42.2	20	44.4	18	40	1.117 .057
-Semi Protrusive	26	57.8	25	55.6	27	60	
Number of breastfeeding:							
1- <4	7	15.6	9	20	8	17.8	1.304 .050
4- <8	19	42.2	16	35.6	18	40	
8- <12	19	42.2	20	44.4	19	42.2	
Duration of breast feeding:							
1 - <5 min	4	8.9	3	6.7	4	8.9	2.841 .043*
5 - <10min	15	33.3	10	22.2	11	24.4	
10- <15min	26	57.8	32	71.1	30	66.7	

Table(3) showed that there was slight significant difference between three studied groups related initiation of breast feeding, type of feeding and duration of breast feeding at p value <0.05. Meanwhile, there was no difference related Part of the breast introduced into the mouth, nipple withdrawal, nipple type and number of breast feeding at p value >0.05.

Table (4): Number and percent distribution of the studied subjects according to their nipple trauma score post the intervention at fourteenth day (N=135)

Items	Olive oil (N=45)		Coconut oil (N=45)		Breast milk (N=45)		ANOVA test
	N	%	N	%	N	%	
No skin change	29	64.4	26	57.8	14	31.1	6.082 .006**
Erythema or edema	12	26.7	13	28.9	18	40	
Superficial damage with or without scab formation on <25% of nipple	3	6.7	4	8.9	7	15.6	
Superficial damage with or without scab formation on >25% of nipple	1	2.2	2	4.4	6	13.3	
Partial thickness wound with or without scab formation on <25% of nipple	0	0	0	0	0	0	
Partial thickness wound with or without scab formation on >25% of nipple	0	0	0	0	0	0	

Table (4) presented that there was highly significant difference between mean scores of three studied group related nipple trauma score at 14th day after intervention with p value <0.01.

Table (5): Compare mean between studied groups according nipple trauma score (N=135)

Items	Observation day	Olive oil (N=45)	Coconut oil (N=45)	Breast milk (N=45)	Anova test	P Value
		Mean s.d	Mean s.d	Mean s.d		
Nipple trauma score	1 st	1.23±0.36	1.34±0.28	1.29±0.41	1.108	0.062
	7 th	0.97 ±0.26	1.01 ±0.30	1.24±0.34	4.261	0.009**
	14 th	0.47±0.15	0.6 ±0.17	1.13±0.29	6.082	0.006**
ANOVA		5.930	4.377	1.745		
P value		.008**	.009**	.048*		

Table (5) revealed that there was highly significant difference between mean score of olive oil group and coconut oil group at 1st, 7th, 14th with p value <0.01. While, there was slight significant difference at breast milk group at p value <0.05. While, there was highly significant difference between mean scores of three groups at 7th and 14th day with p value <0.01. But, there was no significant difference between three groups at 1st day with p value >0.05.

Discussion:

Cracked nipple is a complaint that can occur in breastfeeding women due to sort number of potential causes. Cracked nipple can lead to soreness, irritation or dryness one or both nipples (**Firouzabadi, Pourramezani & Balvardi, 2020**). The mother with a cracked nipple can have severe nipple pain when the infant is feeding. This severe pain is a hindrance for continuous breastfeeding (**Schulman & Rosner, 2020**).

At this study, after analyzing the collected data accepted the research hypothesis. The current study detected that olive oil, coconut oil and breast milk in their order had positive effect on management of nipple soreness, breast milk had least effect while olive oil had highest effect. These results disagreement with the study conducted by **Eshgizade et al., 2016** who reported that there was no significant difference between breast milk and olive oil groups. Also, in cohort with **Pezechki et al., 2020** who presented that no significant difference was observed between the mother's breast milk group and olive oil and Usage of these therapeutic methods is suggested to improve sore nipples given their low cost and limited side effects.

While consistent with the study by **Chaudhary, Banu, & Farswal, 2019** who found that mean post-test score of experimental "olive oil" and control group for both breast detected 79% reduction in engorgement score, this is statistically significant as evident from

p<0.001. Also, **Indrasari & Nurlaila, 2018** who detected that olive oil and coconut oil had beneficial effect at breast care. And, regular with the study performed by **Gharakhani et al., 2018** who stated that breast milk was more effective than mint cream and mint tea in the treatment of cracked nipple.

At the present study revealed that highly significant difference between mean score of olive oil group and coconut oil group at 1st, 7th, 14th with p value <0.01. while, there was slight significant difference at breast milk group at p value <0.05. These results supported with the study conducted by **Alamolhoda, Mirabi, & Mojab, 2020** who pointed that nipple discharge between the two groups before treatment and 10 days after delivery and before treatment and 14 days after delivery, indicated a significant difference (P<0.001). Also, as same line with the study by **Ismail, Hafez & Ghaly, 2019** who stated that the mean score of nipple pain, nipple soreness and nipple trauma were significantly decreased among the breast milk, peppermint water, and breast shell groups in the seventh and fourteenth day of intervention. There was a statistically significant difference between the three groups.

Cordero et al., 2015 revealed at their study that olive oil helps prevent nipple cracking in lactating women. It has been shown to have protective effects when breastfeeding presents technical difficulties, so cohort with my finding at current study. And, **D'souza, Kamath & Devi, 2019** agreement with our finding, who detected that coconut oil and olive

oil, improved healing of nipple soreness. Also, current results similar with the study conducted by **Oğuz, Işık, Güngör, Şeker & Oğretmen, 2014** who stated that olive oil is a safe, accessible, and beneficial choice for preventing sore nipples.

Conclusion:

To conclude, According to these findings, the current study detected that olive oil, coconut oil and breast milk had positive effect on management of nipple soreness, breast milk had least effect while olive oil had highest effect.

Recommendations:

- Further explore olive and coconut oil's possible positive effects on the prevention of sore nipples
- Raising awareness of breastfeeding mother regarding the beneficial effect of olive oil and coconut oil on nipple trauma

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