

Effect of Foot and Hand Massage on Relieving Post-Cesarean Section Incisional Pain and Improving Patient' Satisfaction

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ABSTRACT

Back ground: Pain is one of the most common problems after cesarean section. Pain can interfere with a woman's ability to care for herself and her baby, so this study **aimed to** evaluate the effect of foot and hand massage for relieving post-Cesarean section incisional pain and improving patient' satisfaction.

Subjects and methods: *Setting:* This study was conducted in the department of obstetrics and gynecology (postnatal ward) of El-Manzala General Hospital at Aldakahlia Governorate. *Design:* Quasi-experimental research design was used to achieve the aim of the current study. *Sampling Type:* Convenience sampling.

Sample: The sample size was estimated to be 159 subjects divided into 3 groups (53 mothers for each group). *Tools:* Four data collection tools, An interviewing structured questionnaire, Numerical rating scale; Modified McGill pain questionnaire short form (SF-MPQ), and Likert Scale. **Results:** There was significant relieving of pain level among the three intervention groups (foot, hand, foot & hand massage groups) at the third session of massage where ($P < 0.01$). Foot and hand massage group had significantly lower pain scores than the other two groups ($P < 0.05$).

Conclusion: Foot and hand massage has a positive effect in reducing the mean score of pain level post-cesarean section. Also, the majority of patients post cesarean section were satisfied with the application of foot and hand massage for reliving post-cesarean section incisional pain. **Recommendations:** using of foot and hand massage to be one of the routine care to women post-cesarean Also, A distribution of a booklet about pain management post cesarean section and distributed among post-cesarean section mother.

Keywords: Foot and hand massage, Incisional pain, post cesarean section, and Relieving pain.

1. Introduction

Cesarean section, also known as C-section, or cesarean delivery, is the surgical procedure by which one or more babies delivered through an incision in the mother's abdomen, often performed because vaginal delivery would put the baby or mother at risk. Cesarean Section (CS) is a surgical procedure used to deliver a baby

through incisions in the abdomen and uterus (Hogan et al., 2020).

The Cesarean section rate has been increasing globally. In 2015, the *World Health Organization (WHO)* reported that an increase in Cesarean section rates were to 10-15% at the population level are associated with decreases in maternal, neonatal, and infant mortality. In Egypt, the past decade has witnessed a sharp increase in the prevalence of CS with the most recent Egypt Demographic and Health Survey (EDHS) documenting a CS rate of 52 percent, which suggests that cesarean delivery might be overused or used for inappropriate indication (**Abdel-Tawab et al., 2018**).

Postoperative pain can complicate and delay patient's recovery, lengthen hospital stays and costs, and interfere with a patient's return to activities of daily living. Pain medications in many people can have unpleasant side effects. In addition, the technological advances in health care routine analgesics procedures in post-operative pain control remain inadequate and thus require complementary therapies and interventions (**Kintu et al., 2019**).

In recent years, many complementary therapies such as massage, music, and reflexology are tried for pain management. Foot and hand massage act on the nerve cell endings which initiate the

sensation of pain. These are sensory receptors that send signals of pain. They are located at the surface of internal tissues and beneath the skin, densely in hands and feet (**Firdausi et al., 2020**).

The feet and hand massage are easily accessible, noninvasive, and inexpensive, easily performed and taught and can be applied to people in any position. Nurse has a role to control and relieve acute postoperative pain by using both pharmacologic and non-pharmacologic approaches (**Firdausi et al., 2020**).

Patient satisfaction with seeking health services is considered as one of the necessary outcomes of health systems and a measure of health service quality which is directly linked with utilization of the services. Asking patients for what they think about the health service and treatment they have received is an important step for improving the quality of service and for assuring that local health service deliveries are meeting patients' service needs (**Eshetie et al., 2020**).

Significance of the study:

Pain was the most frequently identified postpartum problem among Cesarean section mothers. Effective postoperative pain control can be achieved

through pharmacological and non-pharmacological management. Massage is one of the most widely used as alternative therapies in nursing practice. Foot and hand massage have the potential to aid pain relief (Zaied et al., 2017).

No previous studies were conducted at Suez Canal University to discuss the effect of foot and hand massage on post Cesarean section incisional pain. So this study was conducted to evaluate the effect of foot and hand massage for relieving post-Cesarean section incisional pain and in following improving patient' satisfaction.

The aim of the study:

The aim of the study was to investigate the effect of foot and hand massage for relieving post-cesarean section incisional pain and in following improving patient' satisfaction.

Research Hypothesis: Women who receive foot and hand massage will have significant relieve in post-cesarean section incisional pain and better satisfaction.

2. Subject and Methods

2.1. Study design: Quasi-experimental research design was used in this study.

2.2. The sample of the study: One hundred fifty-nine women were recruited in the study. The sample was divided into three groups: first group for foot massage, second group for hand massage while the third intervention group for foot and hand massage (53 for each group).

Power of study estimation

The sample size was calculated using Epi-save software (WHO, 2014) to conduct a comparative study to evaluate the effect of foot and hand massage on relieving post-cesarean section incisional pain. The estimated sample size is made at the assumption of 95% confidence level and 80% power of the study. The sample size was estimated to be 153 subjects approximately 159 subjects (included in the study to detect the change of pain score from 2.5 ± 1.4 to 1.8 ± 1.1 (Abd Elhaleem et al., 2013).

2.3. Sampling Type:

Convenience sampling was used to select the study sample depending on the inclusion and exclusion criteria until the sample size was completed. The three studied groups were systemically assigned; where the first two mothers who attended to post C.S department were included in the

first group, the second two mothers registered were included in the second group. While the third two mothers registered were included in the third group.

2.4. Study setting:

The study was carried out at the postnatal ward of the obstetrics and gynecologic department in Elmnzala General Hospital in Elmnzala city at Aldakahlia Governorate, Egypt.

2.5. Tools of data collection:

2.5.1. Tool (1): A structured interview questionnaire: Involved: a) demographic data of mothers as (personal data, name, age, education, and occupation), b) obstetrical history of women as gravidity, parity, number of previous cesarean section, the experience of previous post-cesarean section pain.

2.5.2. Tool (2): Numerical rating scale

Is a pain assessment scale with fixed scale steps, a linear line with marks spaced (1) cm apart ranging from 0 (no pain) to 10 (worst pain imaginable) pain degree.

Scoring system of Numerical rating scale:

No pain (0), mild pain from (1 to 3), moderate pain from (4 to 6), severe pain

from (7 to 9), and worst pain imaginable (10). It is widely preferred by national and international investigators for its applicability and clarity in determining the pain intensity of mothers before and after intervention (**Basyouni et al., 2018**).

2.5.3. Tool (3): Modified McGill pain questionnaire short form (SF-MPO) **(Dworkin et al., 2009):**

This scale was used to assess pain characteristics. This tool is consists of (14) words that measured pain description pre and post-intervention: palpating pain, shooting, stabbing, sharp, cramping, burning sensation, aching, heavy, tender, cutting, tiring, exhausting, fearful, and punching pain.

2.5.4. Tool IV: Likert Scale: It was used to assess mothers' satisfaction towards pain management at 7 hours post-cesarean section. The scale scores are; satisfied = 1, slightly satisfied = 2 and dissatisfied = 0 (**Allen et al., 2007**).

2.5.5. Reliability of the Tools:

The tool was assessed by using Cronbach's alpha to check the internal consistency, tool I Structure interviewing questionnaire was 0.78, tool II Numerical

rating scale was 0.81, tool III Modified McGill pain questionnaire short form was 0.84, finally tool IV Likert scale was 0.79.

2.6. Field work:

The collection of data covered 11 months from October 2018 until August 2019. The investigator attained the study setting during the working days (3 days per week). From the department of obstetrics and gynecology (postnatal ward). During the day work, the investigator has visited the department of obstetrics and gynecology (postnatal ward) from 9 AM to 9 PM. after that the mother was selected from mentioned setting according to the previous criteria: Inclusion criteria (Conscious mothers and accepted to participate in the study).

Exclusion criteria (Mothers who administered analgesic post CS, mothers have ante and post-natal complications as eclampsia, bleeding, diabetes mellitus and mothers who had damaged tissues and skin on their hands or feet, skin diseases as arthritis, phlebitis, burn wound, injury, inflammation, eczema, cardiovascular and respiratory diseases.

Procedure of massage:

Firstly, the aim of the study was explained to the mother and their oral consent was obtained individually. The

investigator established a friendly relationship with the mother and explained the procedure simpler, and replied to their questions. Structured interview questionnaire was filed. Then; the mother was asked to lie back on the bed and the researcher, after washing her hands and cleaning the mother's feet or /and hands with a wet towel, performed the massage intervention. The main specialized massage techniques included rotational friction movements, stretching, grasping, and flexing on different parts of hands and feet from wrist to toes without focusing on a certain point (**Youssef and Diab, 2017**).

The *first intervention group* was received a foot massage for 10 minutes 5 minutes for each foot; while *the second intervention group* was received a hand massage for 10 minutes (5 minutes for each hand). *The third intervention group* was received a post-cesarean section foot and hand massage for 20 minutes (5 minutes for each). Foot and hand massage was applied three times during 2nd, 4th, 6th hours after CS the investigator measure the level of pain before the massage session and immediately after massage and after one hour of massage.

The technique of foot and hand massage:

The mother was asked to avoid talking during the massage unless necessary. The investigator applied the massage without using any equipment, which includes petrissage, kneading, and friction applied to the patient's hands and feet using classical massage techniques (Zaied et al., 2017).

Foot massage, the mother's foot was elevated by supporting it with a pillow. The sole was spread and rubbed by the researcher's fingers. The thumb was used to make circles over the entire sole. The knuckles of one hand stroked the sole with an up-and-down motion. The heel and ankle were kneaded between the researcher's thumb and forefinger. The pillow support was removed to finish the massage (Youssef and Diab, 2017).

Hand massage: The researcher held the mother's hand gently in one of her hands. The researcher used thumb and fingers to make circles over the mother's entire palm, all fingers, and the outer surface of the hand. The researcher's fingers spread the palm. Hand massage applied to each hand for 5 minutes avoiding the area of cannula (Zaied et al., 2017).

The investigator has assessed the level

of pain intensity of the mothers by ***Numerical rating scale*** and recorded three times every session of foot and hand massage (before and immediately post-massage and after one hour of massage). Pain description was assessed pre and post-intervention by ***Modified McGill pain questionnaire short form***. Mother's satisfaction was also assessed by using the ***Likert Scale*** after three sessions of massage.

2.7. Administrative design:

Official permission was obtained by submission of an official letter from the Faculty of Nursing to the responsible authorities of the El Manzala General Hospital and the chairman of the obstetric & gynecological department to obtain the approval to conduct this study.

2.8. Ethical considerations:

Full details and explanations of the aim of the study were provided to the participants focusing on the confidentiality of the personal information and the importance of the study. Oral consent was taken from the participants after confirming that they can withdraw from the study at any time.

2.9. Statistical design:

The collected data was coded, organized, categorized, tabulated, computerized and analyzed using statistical package of the social sciences (SPSS) software program version 25.

3. Results

Table (1): Frequency distribution among the studied sample according to their general characteristics, it shows that, mothers' age ranged from 18 - 38 years. The mean age of foot, hand and foot and hand groups was 25.7 ± 5.03 , 27.5 ± 5.62 & 25.69 ± 5.67 , respectively. Also, the mothers who had intermediate qualification were more prevalent, they constitute 52.8%, 58.5% & 58.5% in three groups, respectively. The majority of mothers in three groups (77.4%, 71.7% & 81.1% respectively) were housewives. As regard, residence, the majority of mothers in three groups (64.2%, 75.5% & 73.6% respectively) were residing in rural areas. Likewise, no statistical significant differences were found in all above variables $P > 0.05$.

Table (2): Comparison between the three studied groups post massage at three session regarding to level of pain, it reveals that there is no significant difference between

the three groups related to level of pain post-massage at first session, where $p = (<0.05)$. As regard, the majority (92.5%, 92.5% and 56.6% respectively) of three group had severe pain post massage at first session. **In addition**, there is no significant difference was founded between the three groups related to level of pain post- massage at second session, where $P > 0.05$. As regard, all (100% respectively) of three group had moderate pain post massage at second session. **Moreover**, there is high significant difference between the three groups related to level of pain post- massage at third session, where $P < 0.01$. As regard, (94.3%, 100% and 75.5% respectively) of three group had moderate pain post-massage at third session.

Figure (1): Frequency distribution of the foot massage group regarding their satisfaction towards foot & hand massage post-intervention (n= 53). It shows that 60.3% of the foot massage group regarding had slight satisfaction towards foot massage post-intervention. While, 34% of them were satisfied.

Figure (2): Frequency distribution of the hand massage group regarding their satisfaction towards foot & hand massage post-intervention (n= 53), shows that 60.3%

of the hand massage group have slight satisfaction towards hand massage post-intervention. While, 28% of them were satisfied.

Figure (3): Frequency distribution of the foot and hand massage group regarding their satisfaction towards foot & hand massage post-intervention (n= 53) shows that 83% of the foot & hand massage group have total satisfaction towards hand massage post-intervention. While, 17% of them have slight satisfaction.

4. Discussion

The hypothesis of this study was significantly approved within this framework of the present study hypothesis, which was that using of foot, and hand massage has positive effect on relieving post-cesarean section incisional pain and improving patient satisfaction.

Regarding general characteristics of the studied sample, the present study revealed that majority of mothers' age ranged from 18 - 38 years. Also, more than half of the mothers who had intermediate qualification were more prevalent. The majority of mothers in three groups were housewives. As regard, residence, the majority of mothers in three

groups were residing in rural areas. This result was in agreement with **Mirhosseini, et al., (2021)** who founded that majority of mothers' age ranged from 25:35 years and they had secondary level of education.

Also, this result was supported with **Kukimoto, et al., (2017)** who reported that majority of women were housewives, and more than three quarters of them were lived in rural areas. Conversely, this result was in disagreement with **Mol, et al., (2020)** who found that majority of mothers had high level of education, and more than two thirds of them were lived in urban areas

Concerning with comparison between studied groups (foot, hand, foot & hand massage) post-massage at first, a second and third session about the level of pain (table 1), the present study showed that the majority of three groups had severe pain pre and post-massage at the first session, all of three groups had moderate pain post-massage at the second session, and all of three groups had moderate pain post-massage at the third session. In addition, there is no significant difference between the three groups related to the level of pain post-massage at the first session. In the second session, all three groups had moderate pain post-massage.

Moreover, most of the three groups had moderate pain post-massage at the third session and there is a highly significant difference between the three groups related to the level of pain post-massage at the third session.

The findings of this relatively agree with **Irani et al.,(2015)** who reported that there was no significant difference between the two groups (intervention and control group) concerning their levels of pain and anxiety before the massage. However, the levels of pain and anxiety significantly decreased in the intervention group, immediately, 60, and 90 minutes after the intervention of applying five minutes for each foot and hand massage on post-cesarean section pain and anxiety.

Concerning with frequency distribution of the studied mothers about the level of satisfaction (figure 1, 2, 3), the present study showed that there is a highly significant difference between the three groups regarding their level of satisfaction. In the foot massage group, more than one-third of mothers had satisfied while more than one quarter was in the hand massage group and most of the foot and hand massage group.

This result was in agreement with **Tan,**

2014) who applied 10 minutes of hand massage among postpartum mothers" and found that the studied mothers were satisfied and comforted with hand reflexology as an intervention. Additionally, this result agrees with **Awad et al., (2014)** who applied 20 minutes of foot and hand massage for relieving post-cesarean incisional pain and found that there was a statistically significant difference between the two groups, more than two-thirds of the intervention group satisfied with post-cesarean pain management versus less than quarter in the control group. From the researcher's point of view, increased mother's satisfaction may be due to repeated sessions of foot and hand massage.

5. Conclusion:

Up on findings of the present study, there was higher statistically significant improvement in pain score post-intervention compared to pre-intervention of application foot massage, hand massage, and foot and hand massage These supported the hypothesis and aim of the study . Also, the majority of patients post cesarean section were satisfied with the application of foot and hand massage for relieving post-cesarean section incisional

pain.

6. Recommendations:

Based on the results of the present study, the following recommendations were suggested :Using foot and hand massage for relieving post-cesarean section incisional pain, implementing a training program for nurses on the techniques of foot and hand massage, brochure about a foot and hand massage must be distributed among post-cesarean section mothers. Replication of the present study on larger sample size and different settings .

Table (1): Frequency distribution among the studied sample according to their general characteristics (n=159).

.Items	Foot Massage (n=53)		Hand Massage (n=53)		Foot & Hand Massage (n=53)		X ²	P-Value
	N	%	N	%	N	%		
Age (Year)							1.067	.167
<20	5	9.4	3	5.7	8	15.1		
20-<30	35	66	31	58.5	32	60.4		
≥30	13	24.5	19	35.8	13	24.5		
Mean ± S.D	25.7 ± 5.03		27.5 ± 5.62		25.69 ± 5.67		F= 0.621	2.364
Educational level							1.281	.188
illiterate	6	11.3	2	3.8	4	7.5		
read and write	3	5.7	6	11.3	5	9.4		
Intermediate qualification	28	52.8	31	58.5	31	58.5		
high education	16	30.2	14	26.4	13	24.5		
JOB							.423	3.918
housewife	41	77.4	38	71.7	43	81.1		
working	12	22.6	15	28.3	10	18.9		
Residence							1.016	1.900
rural	34	64.2	40	75.5	39	73.6		
urban	19	35.8	13	24.5	14	26.4		

Non-Significant P>0.05

Table (2): Comparison between the three studied groups post massage at three session regarding to level of pain (n=159).

Levels of pain	First session						Second session						Third session						X ²	p-value
	Foot Massage group		Hand Massage group		Foot & Hand Massage group		Foot Massage group		Hand Massage group		Foot & Hand Massage group		Foot Massage group		Hand Massage group		Foot & Hand Massage group			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Mild	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	5.7	0	0.0	13	24.5	14.36	.005*
Moderate	4	7.5	4	7.5	23	43.4	53	100	53	100	53	100	50	94.3	53	100	40	75.5		
Severe	49	92.5	49	92.5	30	56.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0		
	$\chi^2 = 2.321$ p-value= .124						$\chi^2 = 1.327$ p-value= .247						$\chi^2 = 14.98$ p-value = .008**							

(*) Statistically significant at $p < 0.05$. (**) highly statistically significant at $p < 0.01$.

Figure (1): Frequency distribution of the foot and hand massage group regarding their satisfaction towards foot & hand massage post-intervention (n= 53).



Figure (2): Frequency distribution of the hand massage group regarding their satisfaction towards hand massage post-intervention (n= 53).



Figure (3): Frequency distribution of the foot and hand massage group regarding their satisfaction towards foot & hand massage post-intervention (n= 53).



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