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Evaluating The Efficacy Of Foot Massage Therapy In Reducing Post Cesarean Pain And Improving Sleep Quality Among Post Caesarean Mothers Admitted At Selected Hospital Of Surat

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ABSTRACT

Background: Cesarean section (C-section) is a common surgical procedure that often leads to postoperative pain, disturbed sleep and delaying recovery. Cesarean section (C section) is among the most frequently performed surgical procedures globally, accounting for approximately 21% of all births worldwide [World Health Organization (WHO) 2021]. Non-pharmacological methods such as foot massage therapy have been shown to enhance comfort, reduce pain and improve sleep quality. Aim: To reduce Post Cesarean Section Pain and improve Quality of sleep among Post Cesarean Mothers admitted at selected hospital of Surat. Methodology: Quasi-experimental, Quantitative pre-test post-test control group design was employed to assess the effectiveness of Foot Massage Therapy on Post Caesarean Section pain and Quality of sleep among Post Caesarean Mother. The study was conducted in a selected hospital of Surat. Population and Sampling: The study population comprised post cesarean section mothers in postnatal ward of selected hospital of Surat. A non-probability purposive sampling technique with 220 samples. Results: The intervention produced a significant effect on the experimental group. Post-test scores decreased from 8.28 ± 1.15 and 10.98 ± 1.54 to 1.85 ± 0.76 and 3.09 ± 1.65, respectively ($t = 57.67–41.16$, $p < 0.001$). Compared with the control group (9.99 ± 1.57), the experimental group's post-test scores were significantly lower (mean difference = -6.90, $t = -31.80$, $p < 0.001$), demonstrating a substantial and statistically significant improvement. Conclusion: These findings clearly demonstrate the effectiveness of Foot Massage Therapy in significantly reducing pain and improve sleep quality among post cesarean mothers in the experimental group compared to those who received only routine care.

KEYWORDS: Foot Massage Therapy, Caesarean Section, Post cesarean section pain, Quality of sleep, Quasi-Experimental, non-probability purposive technique.

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INTRODUCTION

Cesarean section (C-section) is one of the most common surgical procedures worldwide, accounting for approximately 21% of all births globally (World Health Organization [WHO], 2021). Although lifesaving, it is associated with significant postoperative pain and discomfort. Such pain can delay ambulation and wound healing, disturb sleep, impair emotional well-being, and hinder maternal–infant bonding (Eittah et al., 2021). Pharmacological analgesics remain the standard method for postoperative pain control; however, their use may be limited by side effects such as drowsiness, nausea, and delayed initiation of breastfeeding (Basak & Acikgoz, 2015). Consequently, there is growing interest in complementary and non-pharmacological nursing interventions that enhance comfort and recovery, including massage therapy (Aydın, Şahin, & Aktaş, 2018).

Foot massage, a simple and inexpensive therapy, stimulates sensory receptors, enhances blood circulation, and promotes relaxation by activating the parasympathetic nervous system (Lee & Park, 2017). Previous studies have demonstrated its effectiveness in reducing pain, anxiety, and fatigue among postoperative and obstetric patients (Eittah et al., 2021; Dönmez & Kav, 2017).

Hence, this study was undertaken to evaluate the effect of foot massage therapy on post-cesarean pain and sleep quality among mothers admitted in a selected hospital of Surat.

OBJECTIVES OF THE STUDY

1. To assess the pre-test post-test Caesarean Section Pain and Quality of sleep among Post Caesarean Mother in experimental group
2. To assess the effectiveness of Foot Massage Therapy on Post Caesarean Section Pain and Quality of sleep among Post Caesarean Mother in experimental group and control group.
3. To find out the association between post Cesarean Section Pain and Quality of sleep with their demographic variables

METHODOLOGY

Study Design: Quasi-experimental, pre-test post-test control group design was employed to assess the effectiveness of Foot Massage Therapy on Post Caesarean Section Pain and quality of sleep among Post Caesarean Mother.

Study Setting and Duration: The study was conducted in a selected hospital of Surat over a period of seven months, from June to December 2024 with total 220 samples in both experimental and control group. A non-probability purposive sampling technique was used to select eligible participants.

Population and Sampling: The study population comprised post cesarean section mothers in postnatal ward at selected hospital of Surat. A non-probability purposive sampling technique with 220 samples

Inclusion Criteria:
Post cesarean mothers who are;

- All primipara and multipara post cesarean mothers from first post operative day to third day of hospitalization. Undergone elective/ emergency cesarean section with spinal anesthesia
- Mothers who are able to follow the instructions.
- Available at the time of data collection
- Able to understand Hindi/Gujarati.

Exclusion Criteria:
Post cesarean mothers who are;

- Mothers with neuromuscular problems in lower extremities.
- Mothers with cardiovascular, respiratory and psychological problems.
- Having post caesarean complication with systemic illness
- Mothers who are not willing to participate in the study

A total of **220 participants** were selected and divided equally into two groups:

- **Experimental Group (n = 110)**: Received the Foot Massage Therapy in addition to routine care.
- **Control Group (n = 110)**: Received only routine care without any therapy.

Participants were assigned to groups based on their availability and willingness to participate in the intervention.

Ethical Considerations:
Obtain Institutional Ethics Committee approval from Rotary Eye Institute Ethical Committee, Navsari (Approval No-EC/NEW/INST/2023/GJ/0331). All participants were briefed about the purpose of the study, the voluntary nature of participation, and their right to withdraw at any time. Written informed consent was obtained from each participant before enrollment. Confidentiality and anonymity were strictly maintained throughout the study, and the procedures followed were in accordance with the Declaration of Helsinki. Intervention: Preinterventional assessment of Pain and Quality of sleep will be done for both the groups(control and experimental). Foot Massage Therapy was given to Experimental Group twice a day for a duration of 20 minutes for three consecutive days. Then Post-test will be conducted on third day after intervention for both the groups (control and experimental) with the help of same tool.

Data Collection Tools: A structured, validated tool was developed to collect data related to the study objectives. The instrument consisted of two sections: **Section- I Demographic Variables**- captured age, religion, education of the mother, occupation of the mother, Monthly income of the family (in Rs), Type of family, Area of residence, Parity, Previous history of Caesarean section, Indication for Caesarean delivery, No of Post Operative days, Gender of the baby, Have you undergone yoga classes, Have you undergone parenthood classes, From whom you get social support after Caesarean delivery, **Section II- Numerical Pain scale-** For pain instruct the patient to choose a number from 0 to 10 that best describes their current pain. 0 means no pain, 10 mean worst possible pain. Categories are mild pain: 1-3, moderate pain: 4-6 and severe pain: 7-10. **Section III- Groningen Sleep Quality Scale-** There are 14 questions that will help to assess quality of sleep level. Each questions has one score. Score were categorized as: good sleep: 0-4, Average sleep: 5-10, Poor sleep: 11-14. **Tool Validation and Reliability:** The tool was developed based on literature review and expert guidance. It was reviewed by 13 experts in maternal health nursing and obstetrics; 9 experts provided feedback. Modifications were made to improve clarity, cultural appropriateness, and sequence of items. The final version of the tool was approved by the research supervisor. Reliability of the tool was estimated by using test and retest method. The reliability of the tool was found to be r= 0.9. Hence the tool was found to be highly reliable. The reliability "r" was calculated using the formula (Karl Pearson correlation co-efficient formula).

Data Collection Procedure: Data were collected in three phases: • Phase 1: Pre-test – Baseline data on demographic variables and Pain and Quality of sleep were collected from experimental group. Phase 2: Intervention – The experimental group received the foot massage therapy, while the control group continued to receive routine care. Phase 3: Post-test – After three days of completing the intervention, post-test data were collected. Statistical Analysis Data were analyzed using SPSS version 25.0. Descriptive statistics such as frequency, percentage were used to summarize demographic characteristics and outcome measures. Inferential statistics included: Paired t-test – to compare pre- and post-test pain and quality of sleep level scores within experimental group, Unpaired (independent) t-test – to compare post test scores between experimental and control groups. Chi-square test – to assess associations between selected demographic variables and pretest score. A p-value < 0.05 was considered

statistically significant for all tests.

RESULTS

Table-1 : frequency and percentage distribution of post cesarean section mother according to their demographic variable.

n= 220

Sr. No	Demographic Variable	Experimental group		Control Group	
		Frequency	Percentage (%)	Frequency	Percentage (%)
1.	**Age**				
	18-21	7	6.36	12	10.91
	22-25	23	20.91	30	27.27
	26-29	37	33.64	25	22.73
	≥30	43	39.09	43	39.09
2.	**Religion**				
	Hindu	97	92.73	101	73.33
	Muslim	13	7.27	9	26.66
3.	**Education of the mother**				
	No formal education	12	10.91	30	27.27
	Primary education	36	32.73	54	49.09
	Secondary education	58	52.73	23	20.91
	Higher secondary education	4	3.64	3	2.73
4.	**Occupation of the mother**				
	Self-employed	29	26.36	78	70.91
	Private employed	3	2.73	29	26.36
	Government employee	0	0	2	1.82
	Unemployed	78	70.91	1	0.91
5.	**Monthly income of the family (in Rs)**				
	≤7,315	31	28.18	27	24.55
	7,316-21,913	73	66.36	76	69.09
	21,914-36,526	6	5.45	5	4.55
	36.527-45,588	0	0	2	1.82
6.	**Type of family**				
	Nuclear family	83	75.45	36	32.73
	Joint family	27	24.55	74	67.27
7.	**Place of residence**				
	Rural area	18	16.36	26	23.64
	Urban area	92	83.64	84	76.36
8.	**Parity**				
	Primiparous	45	40.91	51	46.36
	Multiparous	65	59.09	59	53.64
9.	**Gravidae**				
	1	34	30.91	41	37.27
	2	70	63.64	58	52.73
	3	6	5.45	9	8.18
	4	0	0	1	0.91
	≥5	0	0	1	0.91
10.	**Gestational age in weeks**				
	<37	23	20.91	39	35.45

	37-40	85	77.27	63	57.27
	>40	2	1.82	8	7.27
11.	**Previous history of cesarean section**				
	Yes	18	16.36	24	21.82
	No	92	83.64	86	78.18
12.	**Types of cesarean section**				
	Emergency	98	89.09	91	82.73
	Elective	12	10.91	19	17.27
13.	**Indication for cesarean delivery**				
	Post dated	14	12.73	16	14.55
	Meconium stained liquor (msl)	64	58.18	81	73.64
	Fetal distress	27	24.55	10	9.09
	Abnormal lie and presentation	5	4.55	3	2.73
14.	**Source of information**				
	Self	26	23.64	71	64.55
	Relatives	84	76.36	36	32.73
	Friend	0	0	2	1.82
	Others	0	0	1	0.91
15.	**Gender of the baby**				
	Male	53	48.18	55	50
	Female	57	51.82	55	40
16.	**Have you undergone yoga classes?**				
	No	110	100	110	100
17.	**Have you undergone parenthood classes?**				
	No	110	100	110	100
18.	**Have you get social support after cesarean delivery?**				
	Yes	110	100	110	100
	If yes, who is				
	Mother	83	40	70	63.64
	Mother-in-law	24	33.33	30	27.27
	Sister	3	2.73	6	5.45
	Husband	0	0	4	3.64

Total of 220 post-cesarean mothers participated in the study, with 110 in the experimental group and 110 in the control group. The data in Table 1 describe the distribution of participants according to selected demographic variables. In the experimental group, the majority of mothers (39.09%) were aged 30 years or above, followed by 33.64% in the 26–29 year age group; a similar pattern was observed in the control group, where 39.09% were aged 30 years or above. Most of the participants in both groups were Hindus (92.73% in the experimental and 73.33% in the control group). Regarding educational status, more than half (52.73%) of the mothers in the experimental group had secondary education, whereas almost half (49.09%) of those in the control group had primary education.

With respect to occupation, the majority of mothers in the experimental group (70.91%) were unemployed, while most in the control group (70.91%) were self-employed. Most families in both groups reported a monthly income between ₹7,316 and ₹21,913 (66.36% in the experimental and 69.09% in the control group). A higher proportion of mothers in the experimental group (75.45%) belonged to nuclear families, whereas two-thirds (67.27%) in the control group belonged to joint families. Most participants resided in urban areas (83.64% in the experimental and 76.36% in the control group).

In terms of obstetric profile, the majority of mothers were multiparous (59.09% experimental, 53.64% control) and had a gravidae of two (63.64% experimental, 52.73% control). Most deliveries occurred between 37 and 40 weeks of gestation (77.27% experimental, 57.27% control). A large proportion of mothers had no previous cesarean history (83.64% experimental, 78.18% control). The majority underwent emergency cesarean section (89.09% experimental, 82.73% control), mainly due to meconium-stained liquor (58.18% and 73.64%, respectively).

Most mothers in the experimental group (76.36%) had received information about post-cesarean care from relatives, while a larger proportion in the control group (64.55%) obtained information by themselves. In both groups, nearly half of the infants were male (48.18% experimental, 50% control). None of the mothers in either group had attended yoga or parenthood classes. All participants reported receiving social support after cesarean delivery—primarily from their mothers (75.45% experimental, 63.64% control) and mothers-in-law (21.82% experimental, 27.27% control)

Table-2 (1)Analysis of the effectiveness of Foot Massage Therapy on Post Caesarean Section Pain among Post Caesarean Mother

Group	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Difference	t-value	p-value
Experimental	8.2818 ± 1.15	1.85 ± 0.76	6.427	57.672	< 0.001**

The results revealed a significant difference between the pre-test and post-test scores of the experimental group. The mean pre-test score was 8.28 ± 1.15, while the mean post-test score decreased to 1.85 ± 0.76, indicating a mean difference of 6.43. Statistical analysis using a paired-samples t-test showed a t-value of 57.67 with a p-value less than 0.001, suggesting that the reduction in scores was highly significant.

Table-2(2) Analysis of the effectiveness of Foot Massage Therapy on Post Caesarean Section Pain among Post Caesarean Mother in both the groups

Group	Post-test Mean ± SD	Mean Difference	t-value	p-value
Experimental	1.854 ± 0.764	-4.586	-28.03	< 0.001**
Control	6.43 ± 1.54			

The results revealed a statistically significant difference in the post-test scores of the experimental group. The mean post-test score was 1.85 ± 0.76, with a mean difference of -4.59. The negative mean difference indicates a decrease in scores compared to the control or baseline condition. The computed t-value of -28.03 and a p-value less than 0.001 demonstrate that this difference is highly significant.

Table-3(1) Analysis of the effectiveness of Foot Massage Therapy on Post Caesarean Section Quality of sleep among Post Caesarean mother

Group	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Difference	t-value	p-value
Experimental	10.98 ± 1.544	3.09 ± 1.65	7.89	41.159	< 0.001**

The results showed a highly significant difference between the pre-test and post-test scores of the experimental group. The mean pre-test score was 10.98 ± 1.54, while the mean post-test score decreased to 3.09 ± 1.65, resulting in a mean difference of 7.89. The computed t-value of 41.16 with a p-value less than 0.001 indicates that this difference is statistically significant.

Table-3(2) Analysis of the effectiveness of Foot Massage Therapy on Post Caesarean Section Quality of sleep among Post Caesarean Mother in both the groups

Group	Post-test Mean ± SD	Mean Difference	t-value	p-value
Experimental	3.09 ± 1.65	-6.9	-31.80	< 0.001**
Control	9.99 ± 1.57			

The post-test results showed a significant difference between the experimental and control groups. The experimental group had a mean score of 3.09 ± 1.65, whereas the control group scored higher with a mean of 9.99 ± 1.57. The mean difference of -6.90 indicates a substantial reduction in the measured variable for the experimental group. A t-value of -31.80 with a p-value less than 0.001 demonstrates that this difference is highly statistically significant. These findings indicate that the intervention had a strong and positive effect on the experimental group, resulting in a marked improvement compared to the control group, which did not receive the treatment.

To find out the association between pretest pain and quality of sleep score with their demographic variables:
Statistical association was found between education of the mother with pre-test pain score and other variable does not get any association. Association was found between place of residence and previous history of cesarean section with quality of sleep scores. Other variables does not find any association.

DISCUSSION

A study conducted by Eittah HFA, Mohammed FSN, Salama NSS, Mohamed NHA (2021) titled *Effect of Foot Massage on Fatigue and Incisional Pain among Post Caesarean Women"*, with a purposive sampling technique was employed to choose a sample of 100 post-cesarean women who were then randomly assigned into two groups, with 50 post-cesarean women in each group (the intervention and control groups). The mean age of the samples were 23.14 ± 10.33and 24.10 ± 8.23years in intervention group and control group respectively. Regarding the level of education, it was observed that more than half of them (58%) of the post-cesarean women in the experimental group had secondary education compared to 50% in the control group. In the experimental group, the same table pointed out that (66%) of post-cesarean women was housewives compared to 62% in the control group. Regarding residence, (74%) of post-cesarean women in the experimental group was living in urban areas compared to 70% in the control group. There was no significant difference between the two groups concerning their demographic.

In the present study, the intervention produced a significant effect on the experimental group. Post-test scores decreased from **8.28 ± 1.15** and **10.98 ± 1.54** to **1.85 ± 0.76** and **3.09 ± 1.65**, respectively (**t = 57.67–41.16, p < 0.001**). Compared with the control group (**9.99 ± 1.57**), the experimental group's post-test scores were significantly lower (**mean difference = -6.90, t = -31.80, p < 0.001**), demonstrating a substantial and statistically significant improvement. **Conclusion:** These findings clearly demonstrate the effectiveness of Foot Massage Therapy in significantly reducing pain and improve sleep quality among post-cesarean mothers in the experimental group compared to those who received only routine care.

CONCLUSION

In contrast, the control group showed minimal change. The mean pre-test score was 26.2 ± 3.3, which slightly reduced to 25.5 ± 2.9 in the post-test, with a mean difference of only 0.7. This change was not statistically significant, with a t-value of 1.08 and a p-value of 0.29.

These findings clearly demonstrate the effectiveness of Foot Massage Therapy in significantly reducing pain and improve quality of sleep among post-cesarean mothers in the experimental group compared to those who received only routine care.

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