

Research Article

“Effectiveness of Foot Reflexology on Post-Caesarean Pain Among Mothers Admitted In Selected Hospitals at Kolhapur”

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Received: 13.07.25, Revised: 16.08.25, Accepted: 12.09.25

ABSTRACT

Background and Objectives

Caesarean section rates are rising globally, with 25.4% of deliveries in Maharashtra, India, performed via caesarean section. Post-caesarean pain is a significant concern, often requiring effective management to enhance recovery and maternal satisfaction. Non-pharmacological interventions like foot reflexology offer a safe, cost-effective alternative to pharmacological methods.

The researcher aims to assess the post caesarean pain among mothers admitted in Dr. D. Y. Patil Medical College Hospital and Medical Research Institute, Kolhapur. The study seeks to understand the effectiveness of foot reflexology on post caesarean pain among mothers.

Objectives: The present study is aimed that to assess effectiveness of foot reflexology on post-caesarean pain among mothers admitted in selected hospitals at Kolhapur.

The objectives are as follows,

- 1.To assess the post caesarean pain among mothers in experimental and control group.
- 2.To evaluate the effectiveness of foot reflexology on post caesarean pain among mothers.
- 3.To compare the post-test pain scores among mothers between experimental and control group.
- 4.To find out an association between pre-test pain scores of mothers with their selected socio demographic variables in experimental group and control group.

Methods: A quasi-experimental pre-test post-test control group design was used, involving 74 post-caesarean mothers (37 experimental, 37 control) was selected by using non probability purposive sampling technique. The experimental group received foot reflexology (10 minutes per feet, daily for 5 days, while the control group received hospital routine care. Pain was assessed on 6th post operative day by using the visual analogue pain scale (VAS). Data was analysed using descriptive statistics, paired and unpaired t-tests, and chi-square tests.

Result: In the experimental group, 51.4% had minor pain (VAS 1-3) and 48.6% had moderate pain (VAS 4-6) posttest, compared to 100% moderate pain pre-test. The control group showed no change (100% moderate pain). The mean post-test pain score was significantly lower in the experimental group (2.89 ± 1.2) than the control group (4.89 ± 0.8 ; $t=8.32$, $p<0.001$). No significant association was found between pre-test pain scores and socio-demographic variables ($p>0.05$).

Interpretation and Conclusion: The study concludes that foot reflexology significantly reduces post-caesarean pain, offering a practical, non-pharmacological intervention for maternal care. Its integration into nursing practice is recommended to improve patient outcomes. The findings have implications for nursing practice, education, administration, and research.

Keywords: Foot Reflexology, Post-Caesarean Pain, Visual Analogue Scale, Non-Pharmacological Intervention, Maternal Health.

INTRODUCTION

“Every pain is a gift. Every pain is an opportunity.”

-Maxime Lagace.

Women are the most valuable gift of God on this earth. They occupy a significant place in the society. God has given precious gift to every woman and that is motherhood. ¹ During

motherhood women undergoes a change in her body, which may be perfect to be called as an entire new birth for the women, or as a time of rebirth. Motherhood represents a time of great hope and anticipation for a woman. Pregnancy is a distinct experience that brings significant physiological and psychological changes to her

body and mind. It is a special event not just for the woman, but for her entire family as well.

In the pregnancy, labour there are specific situations in which the surgical procedure sometimes becomes essential in way to preserve the mother and her fetus life. This appreciated as a safe technique for the purpose of better obstetrical results, which became distinct reason to answer for why the number of caesarean sections as increased.² According to report of global health in 2021 revealed 154 countries showed 21.1% of women had caesarean section, by WHO the ideal caesarean section rate ranges from 10 % to 15 % as this indicated there is an increased in cesarean section.³

Pain is produced because of tissue damage resulting from inflammatory responses triggered by a traumatic event. Post operative pain is personal and subjective experience, and no one experience pain in exactly the same manner. Post caesarean pain is being the obstacle for a good breastfeeding position, care for new born and also there is difficulty to perform day to day activities.⁴ Caesarean section results for moderate-to-severe postoperative pain in a major part of the women. If there is a poor management of acute postoperative pain that may trigger for severe postoperative pain, and also it can affect maternal fetal bonding. We nurses play a vital role in assessing, managing, and reducing pain to promote comfort, and facilitate healing.⁵

Effective pain management have variety of offers like, pharmacological methods and non-pharmacological therapies, additionally, depending on pharmacological methods alone may not always be ideal because of their possible side effects. The use of medications can lead to various adverse effects, including nausea and vomiting to mothers. Non-pharmaceutical methods are being used more frequently to alleviate pain.⁶ Foot reflexology as a promising non-invasive technique. Reflexology is based on a principle that, hands and feet are made up of zones which reflects the different organs, body parts and systems, known as reflex areas. By stimulating these

reflex areas, most commonly using specific massage techniques can reduce stress and pain in the related parts of the body.⁷ Reflexology is kind of massage in which forefinger and the thumb are used to trigger pressure points of feet. As stated, that feet contain over 7,000 nerve endings, which connects to various organs in the body.⁸ Stimulating and applying slight pressure to those nerve endings can assist in addressing a range of physical issues, including general relaxation of the body, reducing pain perception, by affecting the locomotor system and the nervous system and promotes sleep.⁹ So as all these engender to researcher for selecting the current study to find the effectiveness of foot reflexology in reducing post caesarean pain among mothers who had undergone caesarean section.

METHODS

A quantitative evaluative survey approach was used, and the research design used was a quasi-experimental, pre-test post-test control group design by using non probability, purposive sampling technique 74 (37 experimental, 37 in control group) post caesarean mothers were selected for the study. The pre-test was done by using the tool Section A: Selected socio demographic data, Section B: Visual analogue pain scale. After that foot reflexology was given from 1st post operative day to 5th post operative day for 10 minutes for both feet. The control group has received hospital routine treatment. On 6th day post-test was done by using same tool. Data was analysed by using mean, median, mode, standard deviation, range, paired 't' test, unpaired 't' test and chi square test.

RESULTS

Section I: Findings related to distribution of socio demographic variables in both groups.

In this section, the researcher analyzed and categorized the samples of the study in to two groups based on the selected socio demographic variables.

Table 1: Frequency and Percentage Distribution of Selected Socio Demographic Variables in Both Groups. N=(74)

Variable	Experimental Group	Control Group
Age (years)		
23–27	23 (62.2%)	12 (32.4%)
28–32	13 (35.1%)	19 (51.4%)
33–36	1 (2.7%)	6 (16.2%)
Parity		

Primipara	11 (29.7%)	21 (56.8%)
Multipara	26 (70.3%)	16 (43.2%)
Previous CS		
Yes	11 (29.7%)	14 (37.8%)
No	26 (70.3%)	23 (62.2%)
Gestational age		
36–37	10 (27.0%)	19 (51.4%)
38–39	26 (70.3%)	18 (48.6%)

In current study majority of post caesarean mothers 23(62.2%) belonged to the age group 23-27 while minority 1 (2.7%) belonged to the age group of 33-36 in experimental group whereas in control group majority of post caesarean mothers 11(29.7%) belonged to the age group 23-27 and 18-22 , Majority of post caesarean mothers 21(56.8%) was primipara and minority 16(43.2%) was multipara mothers in experimental group whereas in control group majority of post caesarean mothers 20 (54.1%) was primipara and minority 17(45.9%) was multipara mothers, Majority of post caesarean mothers 26(70.3%) had no any history previous caesarean section while minority 11(29.7%) mother were having history of

previous caesarean section in experimental group whereas in control group majority 23(62.2%) mothers had no any history of previous caesarean section while minority 14(37.8%) were having history of previous caesarean section, Majority of post caesarean mothers 27(73.0%) was in 38 – 39 weeks of gestational age while minority 10(27.0%) was in 36-37 gestational age in experimental group whereas in control group majority of post caesarean mothers 19(51.4%) was in 36-37 gestational age.

Section II: Findings related to mean, median, mode, range, difference of pretest post test post caesarean pain scores of mothers.

Table 2: Mean, Median, Mode Standard deviation and Range.
n=(74)

Groups	Experimental group		Control group	
	Pre-test	Post-test	Pre-test	Post-test
Mean \pm S. D	4.30 \pm 0.57	1.11 \pm 0.93	4.78 \pm 0.63	3.0 \pm 1.08
Median	4.0	1.0	5.0	3.0
Mode	4	01	05	04
Range	02	3	02	03
Difference	3.19 \pm 0.36		1.78 \pm 0.45	

Table 3: Frequency and Percentage (%) Distribution of Samples According to Their Post Caesarean Pain Scores of Samples in Both the Groups.

Pain Level (VAS)	Experimental Group (Pre)	Experimental Group (Post)	Control Group (Pre)	Control Group (Post)
No Pain (0)	0 (0%)	11(29.7)	0 (0%)	0 (0%)
Minor Pain (1–3)	2.(5.4%)	26(70.3%)	0 (0%)	19(51.4)
Moderate Pain (4–6)	35(94.6%)	18 (48.6%)	37 (100%)	18(48.6%)
Severe Pain (7–10)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

In experimental group pretest mean \pm SD (4.30 \pm 0.57) and post-test mean \pm SD (1.11 \pm 0.93) whereas in control group pretest mean \pm SD (4.78 \pm 0.63) and in post-test mean \pm S.D is

(3.0 \pm 1.08). Mean difference of pretest and post-test in experimental group is 3.19 \pm 0.36 whereas in control group mean difference is 1.78 \pm 0.45.

Section III: Findings related to effectiveness of foot reflexology on post caesarean pain among mothers.

Table 4: Effectiveness of Foot Reflexology on Post Caesarean Pain among Mothers.

Mean \pm SD	't' value	'p' value
3.19 \pm 0.181	17.6	*0.001

df₍₃₆₎ = 2.0 p < 0.05* Significance
The above table shows that 'p' value is 0.001 which is less than 0.05 and calculated 't' value was higher than table value i.e. (t_{cal} = 17.6) (t_{tab} = 1.69). Hence H₁ is accepted. The mean post-

test pain scores in experimental group is lower than mean pretest pain scores.
This indicates that the post caesarean pain scores is statistically significant at p < 0.05 level of significance.

Table 5: Effectiveness of Foot Reflexology on Post Caesarean Pain among Mothers.

Mean \pm SD	't' value	'p' value
1.78 \pm 0.09	8.05	*0.001

df₍₇₁₎ = 1.9 p < 0.05 * Significance
The above table shows that 'p' value is 0.001 which is less than 0.05 and calculated 't' value was higher than table value i.e. (t_{cal} = 8.05) (t_{tab} = 1.99). Hence H₂ is accepted. The mean post-

test pain scores in experimental group are lower than their mean post-test pain scores in control group.
This indicates that the post caesarean pain scores is statistically significant at p < 0.05

Significance.

Table 6: Findings Related Association Between Pretest Pain Scores Of Experimental Group with Their Selected Socio-Demographic Variables.

n=(37)

S. No	Variables	't' value	p value
1	Age in years	7.81	0.3
	a) 18 -22		
	b) 23 - 27		
	c) 28 - 32		
2	d) 33 - 37	3.84	0.2
	Number of parity		
	a) Primipara		
3	b) Multipara	3.84	0.3
	Previous Caesarean Section		
	a) Yes		
4	b) No	3.84	0.3
	Gestational Age		
	a) 36 - 37		
	b) 38 - 39		

0.05 significance

Note: - * indicates association

Table 6: indicates that,

There is no association between pre-test pain scores of samples with selected socio demographic variables in experimental group.

Hence, H₀₃ is accepted and H₃ is rejected. This indicates that there is no significant association between pretest pain scores of samples with their selected socio demographic variables. All 'p' values are greater than 0.05.

Table 7: Finding Related To Association Between Pretest Pain Scores Of Control Group With Their Selected Socio-Demographic Variables.

(N=37)

S. No	Variables	't' value	'p' value
1	Age in years	12.59	0.2
	a) 18 -22		
	b) 23 - 27		

	c) 28 - 32 d) 33 – 37		
2	Number of parity a). Primipara b). Multipara	5.99	0.4
3	Previous Caesarean Section c) Yes d) No	5.99	0.5
4	Gestational Age c) 36 – 37 d) 38 - 39	5.99	0.8

0.05 significance

Note: - * indicates association

Table 7: indicates that,

There is no association between pretest pain scores of samples with selected socio demographic variables in control group. All 'p' values are greater than 0.05.

Hence, H_{04} is accepted and H_4 is rejected. This indicates that there is no significant association between pre-test pain scores of samples with their selected socio demographic variables in control group.

DISCUSSION:

1.Findings related to frequency and percentage distribution of socio demographic variables of samples.

In current study majority of post caesarean mothers 23(62.2%) belonged to the age group 23-27 while minority 1 (2.7%) belonged to the age group of 33-36 in experimental group whereas in control group majority of post caesarean mothers 11(29.7%) belonged to the age group 23-27 and 18-22, Majority of post caesarean mothers 21(56.8%) was primipara and minority 16(43.2%) was multipara mothers in experimental group whereas in control group majority of post caesarean mothers 20 (54.1%) was primipara and minority 17(45.9%) was multipara mothers, Majority of post caesarean mothers 26(70.3%) had no any history previous caesarean section while minority 11(29.7%) mothers were having history of previous caesarean section in experimental group whereas in control group majority 23(62.2%) mothers had no any history of previous caesarean section while minority 14(37.8%) were having history of previous caesarean section , majority of post caesarean mothers 27(73.0%) was in 38 – 39 weeks of gestational age while minority 10(27.0%) was in 36- 37 gestational age in experimental group whereas in control group majority of post

caesarean mothers 19(51.4%) was in 36-37 gestational age.

Similar findings noted in the study done by Sabitha. V. On effectiveness of foot reflexology in reducing the post caesarean pain among post caesarean mother. Among 30 samples, majority of a mothers with in the age group of < 20 years (40%) and majority of the caesarean mother's family income was Rs.5000-10000 (66.6%) majority of the caesarean mothers were unemployed (73.3%). Most of them were primipara mothers (53.3%) and Majority of mothers had no any history of pregnancy associated disease (93.3%) and majority of women didn't have the previous history of caesarean section (53.3%). Where as in control group, majority of a mother with in the age group of 25-27 years (33.3%) and majority of the caesarean women's family income was <5000 Rs (46.6%), majority of the caesarean mothers was unemployed (60%), majority of caesarean mothers were multipara (53.3%) and majority of mothers didn't have pregnancy associated disease (86.6%) and majority (53.3%) of mothers have previous history of caesarean section.

2.Findings related to effectiveness of foot reflexology on post caesarean pain among mothers.

In the present study, the calculated paired 't' test value ($t_{cal} = 17.6$) and 'p' value (0.001) is less than 0.05 level of significance, Hence H_1 is accepted and H_{01} is rejected. This indicated that post cesarean pain scores is statistically significant at $p < 0.05$ level. The calculated unpaired 't' test value ($t_{cal} = 8.05$) and 'p' value (0.001) is less than 0.05 level of significance, Hence H_2 is accepted and H_{02} is rejected. This indicated that post cesarean pain scores is statistically significant at $p < 0.05$ level, therefore findings revealed that the foot reflexology is effective to reduce post cesarean pain among mothers.

Similar findings noted in the study done by B. Manjula on effectiveness of hand and foot massage on pain among post caesarean mothers at selected hospitals, Salem". Showed that mean pre intervention score in experimental group was (6.4 ± 0.56) and mean post intervention score was (3.5 ± 0.79) . Calculated 't' value is (33.72) is significant at $p \leq 0.05$ level. Therefore, H_1 is accepted at 0.05 level. The mean score in control group is (6.1 ± 0.65) . The 't' value (15.66) significant at $p \leq 0.05$ level. Hence H_2 is accepted at $p \leq 0.05$ level.

3. Frequency and percentage (%) distribution of samples according to their post caesarean pain scores in experimental and control group.

In the present study, in pretest majority of 35(94.6%) mothers were having moderate pain and minimum 2(5.4%) were having minor pain. In post-test majority of 26(70.3%) mothers were having minor pain and 11(29.7%) mothers were had no pain in experimental group whereas in control group all mothers were having moderate pain 37(100%) in pretest. In post-test majority of 19 (51.4%) mothers were having minor pain and 18(48.6%) mothers were had moderate pain. Similar findings noted in the study done by Sahu.S, Dr. Khan.N , Dr.Lendhe. M. On effectiveness of hand and foot massage on level of pain perception among undergone lower segment caesarean section mothers admitted in selected hospitals at Bhopal. In pretest majority of 18(60%) mothers had severe pain, and mothers 6 (20%) had moderate pain, minority 5(16.7%) had mild pain. After administration of hand and foot massage majority 23(76.67%) of mothers had no pain and minority 7(23.33%) mothers had mild pain. There is significant difference between pretest and post-test level of scores.

4. Findings related to association between pretest pain scores with their selected socio-demographic variable in experimental and control group.

In the present study, there is no significant association between pretest pain scores with their selected socio demographic variables in

experimental group as calculated all 'p' values are greater than 0.05, Hence, H_{03} is accepted and H_1 is rejected, whereas in control group there is no significant association between pretest pain scores with their selected socio demographic variables as calculated, all 'p' values are greater than 0.05, Hence, H_{04} is accepted and H_4 is rejected.

Similar findings noted in the study done by Joseph. A, Frank. R, Ramyashree. S. On effectiveness of post operative pain reduction in caesarean mothers with hand and foot massage. Showed that there was no any association between pain level and age ($\chi^2 = 1.45$), education ($\chi^2 = 3.23$), and previous history of LSCS ($\chi^2 = 1.84$). Hence, there is no any significant association between pre intervention pain score with selected socio demographic variables.

CONCLUSION

Foot reflexology is an effective, non-pharmacological intervention for reducing post-caesarean pain, offering a safe, cost-effective addition to maternal care. Its adoption in nursing practice can enhance patient comfort, reduce reliance on analgesics, and improve recovery outcomes. Nurses should be trained to implement this technique in clinical settings.

Implications of the Study

The findings of the study have implications for the nursing profession. The implications have been written under the following headings, nursing practice, nursing administration, nursing education, nursing research.

1. Nursing practice:

- 1.The use of complementary therapies in healthcare is growing in acceptance and importance. They offer affordable, non-invasive and efficient non- pharmacological supplements to medical treatment.
- 2.Simple interventions can be adopted by nurses like foot reflexology while providing care for post cesarean mothers.
- 3.The intervention used in this study can be applied in the practice set up, thereby increasing the nursing practice based on evidence and this practice enhances the autonomous role of nursing intervention.

- 2.Nursing curriculum should also emphasize issues of post cesarean pain and also alternative methods to reduce pain.

3. Nursing Administration

2. Nursing Education

- 1.foot reflexology should be made as inclusion of treatment of post cesarean pain in nursing curriculum.

1. Administrator can organize educational programs in hospitals areas to provide knowledge regarding importance of foot reflexology to reduce post cesarean pain among mothers.
2. The higher-ranking nurse administrator is required to meet and address the issues facing by the mothers in question.
3. Nurse administrator can formulate nursing practice protocol of foot reflexology to reduce post cesarean pain among mothers.

4. Nursing research

1. The findings of the study had shown that foot reflexology was effective on post cesarean pain. The study will motivate the other researchers to conduct the same study with the different variables on a large scale.
2. More research projects and thesis can be encouraged to be done by staff nurses and

student nurses on various non-pharmacological interventions to reduce post cesarean pain.

Limitations

This study findings cannot be generalized because of small number of samples and it was limited only to Kolhapur.

Recommendations

1. Conduct multicenter RCTs with larger samples to enhance generalizability.
2. Compare foot reflexology with other non-pharmacological interventions (e.g., hand massage, acupuncture).
3. Develop nursing protocols for foot reflexology to standardize its application.
4. Explore long-term outcomes, such as pain recurrence and maternal recovery.

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