



Effectiveness of Planned Early Ambulation on Postoperative Recovery among Cesarean Mothers: A Quasi-experimental study in Mangaluru

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Abstract

Background Mothers with cesarean section need more attention and care. Early ambulation is the essential to restore the maximum muscle function and improve the health during postoperative period. Early ambulation certainly has proven to be effective in preventing postoperative complications.

Aim To evaluate the effectiveness of early ambulation on postoperative recovery among cesarean mothers.

Methods Nonprobability purposive sampling technique was used to select 60 cesarean mothers, with 30 samples in each of the experimental and control group. Mothers in the intervention group received bed exercises by the investigator such as flexion and extension of the extremities, upper limb exercises, lower limb exercise, turning the patient, sitting with dangling the feet, and deep breathing exercises which was initiated at 10 hours of cesarean section followed by standing and walking at 12 hours of cesarean section for twice a day, whereas the control group received routine treatment as per the hospital protocol. Demographic proforma was used to assess the demographic characteristics, and structured postoperative recovery assessment tool was used to assess four major components such as pain, breast feeding, postnatal changes, and activity of daily living. The obtained data were analyzed using descriptive and inferential statistics.

Statistical Analysis Significant difference in the postoperative recovery score was calculated by using RM-ANOVA and independent *t*-test and the association of postoperative recovery score with selected demographic variables done by chi-square test.

Results The majority of mothers in intervention (66.7%) and control group (63.3%) were 24 to 29 years old and had secondary education (60% each). There was significant difference in breast feeding ($p = 0.001$), involution of uterus ($p = 0.047$), amount of lochia ($p = 0.027$), and activity of daily living in the intervention group ($p < 0.05$) compared with the control group.

Conclusion Early ambulation improves the postoperative recovery and helps to achieve a good sense of well-being.

Keywords

- ▶ cesarean mother
- ▶ early ambulation
- ▶ postoperative recovery

Introduction

The well-being of a society depends on the health and survival of mothers and children. Child birth viewed as vital aspect of life, it brings a novice experience in woman's life.¹ Physical, physiological, psychological and socio-cultural factors are the stressors experienced by the woman who undergoes caesarean section.²

Mothers with cesarean section need more care and attention than the vaginal delivery. The role of midwife is to provide excellence service for the well-being of the mother as well as baby and enable the mother to execute the activities of daily living independently as soon as possible.³ This helps the mother to reduce the surgical complications such as urinary tract infection, wound infections, headache, back-ache, bladder and bowel difficulties, postoperative adhesions, incisional hernias, and abdominal discomfort, thereby diminishes the rate of maternal morbidity.⁴⁻⁶

In a developing country such as India, it is necessary to look at the interventions which will make a difference in terms of cost and health benefits. One of the prime aspect of the comprehensive postoperative care is the planned early ambulation.⁷ Early ambulation in the postoperative period is the key to get rapid and maximum muscle function and restoration of mother's health.⁸ Ambulation helps to decrease most complications by ensuring good blood circulation, promoting gastric motility, enhancing respiration, decreasing the chance of thrombophlebitis, preventing orthostatic hypotension, improving physical strength, etc.⁹ Ambulation promotes the flow of oxygen throughout the body, strengthens the muscle tone, improves gastrointestinal and urinary tract functions, reduces the pain intensity, aids in the involution of the uterus, facilitates uterine drainage, and promotes wound healing.¹⁰

With above-mentioned extensive reviews and from personal experience of the investigator in clinical field observed that the time of maternal ambulation varied in every hospital. Addressing the specific needs of the cesarean mothers, facilitating early ambulation may help to overcome the challenges and barriers. This motivated the investigator to find out effectiveness of planned early ambulation on cesarean section postoperative recovery.

Materials and Methods

Quasi experimental posttest only control group design and nonprobability purposive sampling technique was used to recruit 60 cesarean mothers calculated with 5% level of significance, power of 80%, and effect size of 0.74. Hence, the sample size was 30 in each group. Ethical approval was obtained from the Institutional Ethics Committee (YEC2/142). The mothers who have undergone lower segment cesarean section, recovered from spinal anesthesia, hemodynamically stable and willing to participate in the study are included in the study and mothers with major complications of pregnancy and child birth, contraindicated to early ambulation such as strict doctor's advice for rest, PPH, anemia, who had undergone general anesthesia and

whose baby is in NICU excluded from the study. The study was limited to the mothers who have undergone lower segment cesarean section, admitted in the postoperative unit of selected a private medical college hospital at Mangaluru and postoperative recovery was assessed using postoperative recovery assessment checklist, which restricted the amount of information that could be obtained from the study participants.

The study was conducted in a private medical college hospital. The investigator introduced and explained the purpose thereafter ascertained the subject willingness to participate. They were given full autonomy to participate in the study. After obtaining the consent, sociodemographic details were collected. After 10 hours of the cesarean section, bed exercises were given such as flexion and extension of the extremities, upper and lower limb exercises, deep breathing exercises, and slowly turned the patient to the edge of the bed, made to sit with dangling the feet, and assisted to stand by supporting the wounded site, and at 12 hours of cesarean section, the intervention was introduced. On postoperative day 1, the intervention group mothers were made to ambulate around 5 m, thereafter it was gradually increased to 10 m and 20 m. The ambulation was repeated twice a day for 3 days in the interventional group, whereas the control group received the routine treatment as per hospital routine. Pain scores were assessed by numerical pain rating scale, and postoperative recovery was assessed by using the postoperative recovery assessment tool. On the third day, subjective physical well-being among the intervention group and control group was assessed using a rating scale. The investigator was with the subjects throughout the ambulation procedure and monitored carefully. The data collection was terminated by thanking the patients for their participation and cooperation. The collected data were compiled for data analysis.

The postoperative recovery assessment checklist is developed by the investigator consists of total eight items with four major components such as pain (number of analgesics received after ambulation), breast feeding (breast feeding and holding baby independently after cesarean section with support or without support, postnatal changes (involution in centimeter and amount of Lochia by number of pads), and activity of daily living (first bowel movement, initiation of oral intake, removal of catheter, moved out independently from the bed after cesarean section). The tools was validated by seven subject experts and their suggestions were incorporated. The tool was pretested, reliability was tested by establishing the internal consistency using Cronbach's α ($r=0.81$).

Statistical Analysis

The analysis was performed by using IBM SPSS Statistics 23 (Statistical Package for the Social Sciences. Descriptive analysis was performed to present the sample characteristics, Significant difference in the postoperative recovery score within the group and between the groups was calculated using RM-ANOVA and independent *t*-test and the association of postoperative recovery score with selected demographic

variables done by chi-square test. The level of significance was set at 0.05.

Results

► **Table 1** shows that the majority of mothers in the intervention (66.7%) and control groups (63.3%) belonged to 24 to 29 years, both the group had secondary education (60% each). The majority of the mothers were housewives (76.7%, 86.7%), belonged to nuclear family (83.3%, 86.7%), had income below the poverty line (86.7%, 90%). The majority of the mothers were (60%, 83.3%) primiparous, had one cesarean (63.3%, 83.3), which was elective in nature (80%, 93.3%).

The study findings in ► **Table 2** revealed that there was an arbitrary decrease in the postoperative pain score and increased comfort in breast feeding and holding the baby, involution of the uterus and amount of lochia from day 1 to day 3 in the intervention group compared with the control group. The difference was significant in the intervention group ($p < 0.05$). Thus it states that early ambulation facilitates breast feeding, helps in involution of the uterus, and aids in uterine drainage. ► **Table 3** reveals that there was significant difference in the activity of daily living between the groups ($p < 0.05$). Thus, it states that early ambulation improves the activity of daily living. ► **Table 4** shows that there was significant difference in the scores of physical well-

Table 1 Distribution of demographic variables of mothers delivered by caesarean section: $n = 30 + 30$

Sl No.	Demographic characteristics	Intervention Group	Control group
		f (%)	f (%)
1.	Age (y)		
	a. 18–23	7 (23.3)	8 (26.7)
	b. 24–29	20 (66.7)	19 (63.3)
	c. 30–35	3 (10)	3 (10)
2.	Education	2 (6.7)	1 (3.3)
	a. No formal education	8 (26.7)	9 (30)
	b. Primary education	18 (60)	18 (60)
	c. High school	2 (6.7)	2 (6.7)
	d. PUC and above	23 (76.7)	26 (86.7)
3.	Occupation		
	a. Housewife	2 (6.7)	2 (6.7)
	b. Labor	4 (13.3)	1(3.3)
	c. Business	1 (3.3)	1 (3.3)
	d. Professional		
4.	Type of family	5 (16.7)	4 (13.3)
	a. Nuclear	25 (83.3)	26 (86.7)
	b. Extended		
5.	Income		
	a. Above poverty line	4 (13.3)	2 (10)
	b. Below poverty line	26 (86.7)	26 (90)
6.	Parity		
	a. Para 1	18 (60)	25 (83.3)
	b. Para 2	11 (36.7)	5 (16.7)
	c. Para 3	1 (3.3)	0
7.	Number of cesarean section		
	a. One	19 (63.3)	25 (83.3)
	b. Two	10 (33.3)	5 (16.7)
	c. More than two	1(3.3)	0
8.	Type of cesarean section		
	a. Elective	6 (20)	2 (6.7)
	b. Emergency	24 (80)	28 (93.3)

Table 2 Comparison of postoperative pain score, breast feeding, and holding the baby, involution of the uterus, and amount of lochia among the mothers in the intervention and control groups (within group): $n = 30 + 30$

Parameter	Group	Day 1 Mean \pm SD	Day 2 Mean \pm SD	Day 3 Mean \pm SD	F-Value	p-Value
Pain	Intervention group	8.87 \pm 0.34	5.73 \pm 0.78	4.77 \pm 0.85	246.86	0.001*
	Control group	8.87 \pm 0.34	7.83 \pm 0.64	7.3 \pm 0.46	87.61	0.001*
Breast feeding and holding the baby	Intervention group	1.60 \pm 0.49	1.9 \pm 0.30	1.96 \pm 0.18	10.40	0.001*
	Control group	1.23 \pm 0.43	1.43 \pm 0.50	1.40 \pm 0.49	2.31	0.108
Involution (cm)	Intervention group	1.86 \pm 0.34	1.96 \pm 0.18	1.96 \pm 0.18	3.22	0.047*
	Control group	1.26 \pm 0.44	1.26 \pm 0.44	1.43 \pm 0.50	1.70	0.191
Amount of lochia (No of pads)	Intervention group	2.03 \pm 0.41	2.23 \pm 0.43	2.16 \pm 0.37	3.83	0.027*
	Control group	1.63 \pm 0.55	1.80 \pm 0.40	1.73 \pm 0.52	1.27	0.286

F = Repeated measure ANOVA.

* $p < 0.05$ = Significant.**Table 3** Comparison of activity of daily living among the mothers in the intervention and control group: $n = 30 + 30$

Variables	Intervention group Mean duration in hours	Control group Mean duration in hours	t-test	p-Value
First bowel movement after cesarean section	6.53 \pm 2.57	7.23 \pm 0.62	- 4.52	0.001*
Initiation of oral intake after cesarean section	8.03 \pm 0.61	9.23 \pm 0.62	- 7.49	0.001*
Removal of catheter after cesarean section	12.3 \pm 0.88	14.7 \pm 1.51	- 7.28	0.001*
Moved out independently from the bed	12.0 \pm 0.00	19.3 \pm 1.39	- 28.73	0.001*

t = independent t-test.

* $p < 0.05$ = significant.**Table 4** Assessment of physical well-being among the mothers in the intervention and control groups

Group	Day 3	t-Value	p-Value
Intervention group	19.50 \pm 1.22	21.03	0.001*
Control group	10.00 \pm 2.15		

t = Independent t-test.

* $p < 0.05$ = significant.

being in the intervention group and control group ($p < 0.05$). Thus, it states that early ambulation was effective in improving the postoperative recovery among cesarean mothers.

The study also showed (**Table 5**) that there was significant association of mean postoperative recovery scores with selected demographic variables such as age and occupation ($p < 0.05$).

Discussion

In a developing country such as India, it is necessary to look at the interventions that will make a difference in terms of cost and health benefits.¹¹ One of the crucial aspects of the comprehensive postoperative care is the planned early ambulation. Early ambulation is the essential to restore the maximum muscle function and improve the health of the mother during the postoperative period. Planned early am-

bulation not only decreases the many complications associated with surgery but also provides the quality of life.⁷

The present study found that the majority of the mothers in the intervention (66.7%) and control group (63.3%) were aged between 24 and 29 years, had secondary education (60% each) were housewives (76.7%, 86.7%). Most were primiparous (60%, 83.3%). This finding was in line with a previous study conducted at the Krishna Hospital, Karad, in 2015, revealed that the majority of the mothers in the intervention and control groups (66%, 63%) were of 21 to 25 years old, had secondary education (40%, 53.3%), were housewives (93.33%, 83.33%), and were primiparas (36.66%, 53.33%).¹²

Study findings showed that the arbitrary decrease in the postoperative pain score and increased comfort in breast feeding and holding the baby, involution of the uterus, and amount of lochia from day 1 to day 3 in the intervention group compared with the control group. The findings are consistent with the study conducted in Puducherry in 2019 on effect of planned early ambulation on postoperative recovery that revealed a significant difference in the intervention group ($p < 0.05$) in terms of pain score, breast feeding independently, and activities of daily living, proving that early ambulation is effective strategy in postoperative recovery.¹³

A similar study was conducted in Lucknow in 2020 to assess the effectiveness of planned early ambulation on postoperative recovery among cesarean mothers that revealed a significant difference between the mean postoperative pain score, wound healing parameter, and fundal

Table 5 Association of postoperative recovery components with selected demographic variables of mothers in the intervention group and control group: $n = 30 + 30$

Sl. No.	Demographic variables	Postoperative components	Intervention group		Control group	
			Statistical value	p-Value	Statistical value	p-Value
a.	Age (y)	Breast feeding	2.57	0.27	0.78	0.67
		Moved out independently	NA	NA	24.25	0.02*
b.	Education	Breast feeding	2.97	0.39	2.05	0.56
		Moved out independently	NA	NA	6.08	0.91
c.	Occupation	Breast feeding	2.01	0.57	1.40	0.70
		Moved out independently	NA	NA	23.59	0.02*
d.	Type of family	Breast feeding	0.00	1.00	1.40	0.23
		Moved out independently	NA	NA	1.87	0.75
e.	Income	Breast feeding	0.19	0.66	0.18	0.66
		Moved out independently	NA	NA	11.66	0.05
f.	Parity	Breast feeding	1.97	0.37	0.93	0.33
		Moved out independently	NA	NA	0.84	0.93
g.	Number of caesarean sections	Breast feeding	1.16	0.55	0.93	0.33
		Moved out independently	NA	NA	10.84	0.93
h.	Type of caesarean section	Breast feeding	0.13	0.70	0.65	0.41
		Moved out independently	NA	NA	3.48	0.48

Statistical test used: chi-square.

*Significant ($p < 0.05$).

height from postoperative day 0 to postoperative day 3 after ambulation among study and control groups ($p = 0.001$).¹⁴

The study was consistent with the findings of the study conducted in Dehradun in 2019 on the effectiveness of early ambulation on selected postoperative recovery with CS revealed that the experimental group showed gradual improvement in the postoperative recovery from day 1 (23.77 ± 2.763) to day 3 (45.67 ± 2.564), showing that early ambulation was effective in improving all daily living (ADL) among cesarean mothers.¹⁵

The present study revealed no significant association of mean postoperative recovery scores of cesarean mothers with selected demographic variables, except for age and occupation in the intervention group ($p < 0.05$). These findings are similar to the study conducted at Jalandhar, Punjab, to observe the effect of early ambulation on postoperative recovery showing no significant association of mean postoperative recovery scores of cesarean mothers with selected demographic variable in the intervention and control groups ($p > 0.05$).¹⁶

The concept of the study is to maximize the postoperative management by reducing the maternal morbidity, shortening the hospital stay, minimizing the complications, and thereby improve recovery of the mother's undergone cesarean section on their postnatal outcome.³

Implications to Practice

The findings of the study provide evidence in the field of nursing practice, nursing education, nursing administration, and nursing research.

Nursing personnel should emphasize on reinforcement of knowledge and improvement of skill. Methods and protocols of early ambulation can be taught to patients to have speedy recovery and also through health education and comprehensive care, the nurses can guide the women for practicing early ambulation after cesarean section. Nurses can integrate the current research finding in their daily clinical practice.

Recommendations

- A similar study can be done where the early ambulation may begin much early, i.e., 2 hours after cesarean delivery.
- The effectiveness of planned early ambulation can be compared with other pain relief modalities such as muscle relaxant therapy and reflexology.

Conclusion

The study concluded that early ambulation improves the postoperative recovery and thereby helps to achieve a good sense of well-being.

Note

The authors assure that the manuscript has not been submitted to any other journal for publication. The Institutional Ethics Committee has approved this project (Protocol no: YEC 2/142).

Paper Presentation

Won 2nd place in paper presentation in the National Conference on Conceptualizing the Research Methods,

Organized by Masood College of Nursing on March 23, 2021.

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Conflict of Interest
None declared.

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