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Research Article

To Assess the Effect of Early Ambulation and Progressive Exercise on Post-cesarean Section Recovery among Women at Selected Hospitals of the City

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Abstract

Introduction: Cesarean section is a life-saving procedure firmly ensconced in obstetric practice. It poses a barrier to breast-feeding initiation related to delay in maternal-infant contact, maternal pain, and exhaustion. Early ambulation reduces the post-operative complications such as atelectasis, GI discomfort, and circulatory problems.

Methodology: A quasi-experimental research design was used for this study carried out in postnatal wards of selected hospitals of the city. The study samples comprised 110 post-cesarean mothers divided into 55 in the experimental and 55 in control group using non-probability purposive sampling technique. Data were collected based on demographic variables, and assessing the post-operative recovery of mothers after the interventions (i.e., early ambulation and progressive exercise) to them through structured nursing assessment sheet. The data were analyzed using descriptive and inferential statistics such as standard deviation, Karl Pearson's correlation, Unpaired *t*-test, and Chi-square test.

Results: The analysis findings depict that the corresponding $P < 0.05$. After intervention of early ambulation and progressive exercise given to mothers in the experimental group, it depicted that majority of the samples 41 (74.55%) had excellent outcome, 14 (25.45%) had good outcome, whereas in control group, 36 (65.45%) had good outcome, and 19 (34.54%) had poor outcome.

Conclusion: Above data show that early ambulation and progressive exercises among experimental group were effective and improve post-operative recovery early as compared to control group.

Keywords: Early ambulation, post-cesarean, progressive exercise, recovery, women

Introduction

Cesarean section is a major abdominal surgery in which an incision is given on the mother's abdomen and uterine walls to deliver the baby, and this may cause more discomfort, prolonged recovery, and difficulty in returning to normal activity than vaginal delivery.[1] Worldwide, it comprises 60% of total childbirths.[2] Early mobilization include: Moving in bed, sitting out of bed, and standing, ambulating on the spot, hallway ambulation, and low-intensity progressive exercise.[3] Immobility after cesarean section has a different effect on the women physically and mentally, the physical effect may include urinary tract infection, deep vein thrombosis, bowel obstruction, increased pain intensity, and pressure ulcer. Mental effect appears in the presence of different levels of depression. On the other hand, early exercises have various benefits as it improves functional mobility, muscle tone

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strengthens as it alleviates pain intensity, involution of the uterus, Lochial discharge, gastrointestinal and urinary tract function, resumption, and enhancement of wound healing.[4] After the cesarean section, the average duration of hospital stay for most postpartum women was 3–4 days. Encouragement of women to get up and try to walk early after cesarean section plays an important role in speeding women's recovery and reduce the duration of hospital stay.[5] Immobilization has been associated with increased risk of cardiovascular complications, thromboembolic disorders, osteoporosis, and death. Prior studies of early mobilization have shown reductions in length of hospital stay by 1–3 days, lower rates of pulmonary embolism, urinary tract infections, and delirium. At present, one might expect early mobilization to be beneficial in improving the post-operative recovery.[6]

A study assessed women's experience of post-operative pain and pain relief after cesarean birth and birth experience in central Swedish country hospital. Descriptive patient survey design was used. Assessment of pain was done using visual analog scale and birth experience was measured on a seven-point Likert scale. Sixty participants were included in the study. Results showed that high level of pain was experienced during first 24 h of delivery and women were pleased with the pain relief. It also showed that post-operative negatively affected breast-feeding and infant care. The researchers recommended that early mobilization after cesarean birth is important for the mother-child interaction.[7]

Early ambulation after surgery as a newer concept raises medical interest and enthusiasm. The goal of this concept is to optimize the post-operative management of the patient to reduce the morbidity, to enhance recovery of the patient after a surgical procedure, to reduce the hospital stay, and to reduce the costs of healthcare.[8]

Table 1: Frequency distribution of postnatal mothers in the experimental and control group with their sociodemographic characteristics *n* (55+55)=110

Demographic variables	Category	Frequency (%)	
		Experimental group	Control group
Age of mother (years)	20–25	26 (47.27)	25 (45.45)
	26–30	25 (45.45)	27 (49.09)
	31–35	4 (7.27)	3 (5.45)
	Above 35	0	0
Education	No formal education	0	1 (1.82)
	Primary and secondary education	22 (40.00)	22 (40.00)
	Higher secondary	16 (29.09)	13 (23.64)
	Graduation and above	17 (30.91)	19 (34.55)
Occupation	Housewife	28 (50.91)	32 (56.36)
	Self employed	27 (49.09)	23 (41.82)
Type of family	Extended	26 (47.27)	26 (47.27)
	Nuclear	29 (52.73)	29 (52.73)
Duration of married life (years)	1–3	21 (38.18)	17 (30.91)
	4–6	33 (60.00)	38 (69.09)
	>7	1 (1.82)	0
Area of living	Rural	28 (50.91)	27 (49.09)
	Urban	27 (49.09)	28 (50.91)
Dietary habit	Vegetarian	25 (45.45)	31 (56.36)
	Non-vegetarian	3 (5.45)	2 (3.64)
	Mixed	27 (49.09)	22 (40.00)
Performs any exercise during pregnancy	Yes	28 (50.91)	27 (49.09)
	No	27 (49.09)	28 (50.91)
If yes, which kind of exercise	Yoga	2 (7.14)	7 (25.93)
	Walking	21 (75.00)	14 (51.85)
	Meditation	5 (17.86)	6 (22.22)
Primary indication for LSCS	Maternal cause	11 (20.00)	16 (29.09)
	Fetal cause	31 (56.36)	24 (43.64)
	Both	13 (23.64)	15 (27.27)
Type of LSCS	Elective	41 (74.55)	42 (76.36)
	Emergency	14 (25.45)	13 (23.64)
Gestational weeks completed (weeks)	35–37 (preterm)	28 (50.91)	22 (40.00)
	38–40 (full term)	27 (49.09)	33 (60.00)
	>40 (postterm)	0	0
Parity	Primigravida	19 (34.55)	12 (21.82)
	Multigravida	36 (65.45)	43 (78.18)
Previous delivery (if multigravida)	LSCS	12 (33.33)	16 (37.21)
	Forceps	3 (8.33)	1 (2.33)
	NVD	13 (36.11)	14 (32.56)
	Vacuum	8 (22.22)	12 (27.91)
Type of anesthesia given during C-section	General	13 (19.44)	12 (23.26)
	Spinal	42 (80.56)	43 (76.74)

LSCS: Lower segment cesarean section

Objectives of the study

The objectives of this study were as follows:

1. To assess the effect of early ambulation on post-operative recovery among the post-cesarean mothers
2. To assess the effect of progressive exercise on post-operative recovery among post-cesarean mothers
3. To associate the post-operative recovery among post-cesarean mothers with selected demographic variables.

Research Methodology

It indicates the overall plan for obtaining answers to the questions being studied and for handling the difficulties encountered during research process.

Research design

Quasi-experimental research design is used for this study.

Study setting

This study was postnatal wards of selected hospitals of the city.

Study samples and sample size

One hundred and ten post-cesarean mothers divided into 55 in the experimental and 55 in the control group.

Sampling technique

This study was non-probability purposive sampling technique.

Data collection process

Data were collected based on demographic variables, and assessing the post-operative recovery of mothers after the administration of interventions to them (i.e., early ambulation and progressive exercise) through structured nursing assessment sheet.

Sampling criteria

Inclusion criteria

The following criteria were included in the study:

1. Post-cesarean mothers (1–3 days of post lower-segment cesarean section [LSCS]) who are admitted in selected hospitals of the city
2. Who are willing to participate in the study
3. Who are able to follow instructions.

Exclusion criteria

The following criteria were excluded from the study:

1. Critically-ill mothers with known medical or obstetrical problems
2. Who are not willing to participate.

Table 2: Frequency and percentage distribution of level of post-operative recovery in the experimental and control group *n*=55+55=110

Level of post-operative recovery	Score	Frequency (%)	
		Experimental group	Control group
Poor outcome	0–4	0	19 (34.54)
Good outcome	5–8	14 (25.45)	36 (65.45)
Excellent outcome	9–13	41 (74.55)	0

Table 3: Assessment of effectiveness of early ambulation and progressive exercise on post-operative recovery among post-cesarean mothers *n*=55+55=110

Group	Mean±SD	SEM	*t*	*P*
Experimental group	10.07±1.77	0.24	15.933	<0.0001*
Control group	5.24±1.39	0.19		

*Significant. SD: Standard deviation, SEM: Standard error mean

Results

Section 1

Demographic variables of postnatal mothers in the experimental group and control group [Table 1].

Section 2

Assessment of level of on post-operative recovery in the experimental group and control group [Table 2].

Section 3

Assessment of effect of early ambulation and progressive exercise on post-operative recovery among post-cesarean mothers [Table 3].

On observation of the experimental group, mean anxiety score was 10.67 with SD ± 0.24 when it compared with control group mean score 5.24 with SD ± 0.19. It shows that the intervention as early ambulation and progressive exercises in the experimental group, mean recovery level was increased. The statistical un-paired *t*-test illustrates *t* value 15.933, $P < 0.0001$. The difference in level of the experimental and control group observations found statistically significant at 0.05% level. Hence null hypothesis is rejected and research hypothesis is accepted.

Section 4

Association of level on post-operative recovery with selected demographic variables in the experimental group and control groups.

Table 4 describes association of level of post-operative recovery in the experimental group with their demographic variables. The Chi-square was applied to compute the association between the level and demographic variables. There was no association found between the level of post-operative recovery and demographic variables in the experimental group.

Table 5 describes that association of level of post-operative recovery in control group with their demographic variables. The Chi-square was applied to compute the association between the level and demographic variables. There was no association found between the level of post-operative recovery and demographic variables in the control group.

Discussion

The research study findings have been discussed with relevance to the objectives and with other research study findings.

Table 4: Association between level of post-operative recovery with selected demographic variables in the experimental group ($n=55$)

Demographic variables	Level of post-operative recovery			df	χ^2	*P*	Significance
	Poor	Good	Excellent				
Age of mother (years)							
20–25	0	7	19	2	0.58	0.971	NS
26–30	0	6	19				
31–35	0	1	3				
Above 35	0	0	0				
Education							
No formal education	0	0	0	2	0.73	0.964	NS
Primary and secondary education	0	6	16				
Higher secondary	0	4	12				
Graduation and above	0	4	13				
Occupation							
Housewife	0	6	22	1	0.487	0.485	NS
Self employed	0	8	19				
Type of family							
Extended	0	8	18	1	0.734	0.392	NS
Nuclear	0	6	23				
Duration of married life (years)							
1–3	0	6	15	2	0.475	0.789	NS
4–6	0	8	25				
>7	0	0	1				
Area of living							
Rural	0	6	22	1	0.487	0.49	NS
Urban	0	8	19				
Dietary habit							
Vegetarian	0	6	19	2	2.862	0.239	NS
Non-vegetarian	0	2	1				
Mixed	0	6	21				
Performs any exercise during pregnancy							
Yes	0	8	20	1	0.292	0.589	NS
No	0	6	21				
If yes, which kind of exercise							
Yoga	0	0	2	2	1.12	0.571	NS
Walking	0	6	15				
Meditation	0	2	3				
Primary indication for LSCS							
Maternal cause	0	4	7	2	1.387	0.5	NS
Fetal cause	0	8	23				
Both	0	2	11				
Type of LSCS							
Elective	0	11	30	1	0.16	0.689	NS
Emergency	0	3	11				
Gestational weeks							
35–37 (preterm)	0	8	20	1	0.292	0.589	NS
38–40 (full term)	0	6	21				
>40 (postterm)	0	0	0				
Parity							
Primigravida	0	6	13	1	0.574	0.449	NS
Multigravida	0	8	28				
Previous delivery (if multigravida)							
LSCS	0	4	8	3	2.157	0.54	NS
Forceps	0	0	3				
NVD	0	3	10				
Vacuum	0	1	7				
Type of anesthesia given							
General	0	1	6	1	0.317	0.574	NS
Spinal	0	7	22				

LSCS: Lower segment cesarean section, NS: Not significance

In this research study, it shows that, after interventions of the early ambulation and progressive exercise in the experimental group, it depicted that majority of the samples 41 (74.55%) had excellent outcome and 14 (25.45%) had good outcome. It is also observed that mean level of clinical variable outcomes, the mean anxiety score was 10.67 with SD ± 0.24.

In control group, 36 (65.45%) had good outcome and 19 (34.54%) had poor outcome. Also, the level of clinical variable outcomes in control group, the mean score is 5.24 with SD ± 0.19.

Table 5: Association between level of post-operative recovery with selected demographic variables in the control group (n = 55)

Demographic variables	Level of post-operative recovery			df	χ^2	*P*	Significance
	Poor	Good	Excellent				
Age of mother (years)							
20–25	7	19	0	2	1.818	0.403	NS
26–30	11	14	0				
31–35	1	3	0				
Above 35	0	0	0				
Education							
No formal education	0	0	0	2	0.699	0.716	NS
Primary and secondary education	9	13	0				
Higher secondary	5	11	0				
Graduation and above	5	12	0				
Occupation							
Housewife	8	20	0	1	0.9	0.346	NS
Self employed	11	16	0				
Type of family							
Extended	9	17	0	1	0.00	0.992	NS
Nuclear	10	19	0				
Duration of married life (years)							
1–3	8	13	0	2	0.666	0.717	NS
4–6	11	22	0				
>7	0	1	0				
Area of living							
Rural	9	19	0	1	0.146	0.70	NS
Urban	10	17	0				
Dietary habit							
Vegetarian	7	18	0	2	3.227	0.199	NS
Non-vegetarian	0	3	0				
Mixed	12	15	0				
Performed any exercise during pregnancy							
Yes	11	17	0	1	0.567	0.452	NS
No	8	19	0				
If yes, which kind of exercise							
Yoga	1	1	0	2	0.11	0.947	NS
Walking	8	13	0				
Meditation	2	3	0				
Primary indication for LSCS							
Maternal cause	4	7	0	2	0.11	0.946	NS
Fetal cause	11	20	0				
Both	4	9	0				
Type of LSCS							
Elective	14	27	0	1	0.011	0.915	NS
Emergency	5	9	0				
Gestational weeks completed							
35–37 (preterm)	10	18	0	1	0.034	0.853	NS
38–40 (full term)	9	18	0				
>40 (postterm)	0	0	0				
Parity							
Primigravida	6	6	0	1	1.621	0.203	NS
Multigravida	13	30	0				
Previous delivery (if multigravida)							
LSCS	6	10	0	3	4.62	0.202	NS
Forceps	0	1	0				
NVD	6	8	0				
Vacuum	1	11	0				
Type of anesthesia given							
General	2	8	0	1	0.647	0.421	NS
Spinal	11	22	0				

LSCS: Lower-segment cesarean section, NS: Not significance

It shows that the intervention as early ambulation and progressive exercises in the experimental group, mean recovery level was increased.

The unpaired *t*-test was applied to compare the difference between experimental and control group variables.

The statistical un-paired *t*-test illustrates *t*-value 15.933, and the level of $P < 0.0001$ ($P < 0.0001$) that is statistically significant.

The researcher concludes the difference in level of the experimental and control group observations to be found statistically significant at 0.05% level.

The above study findings are supported by a quasi-experimental study conducted on effect of early and progressive exercises on post-cesarean section recovery among women in women's health hospital, Assiut university, Egypt. Three hundred and forty post-cesarean section women were included in the study, divided into two groups, study and control group, each group containing 170 postpartum women. Structured interviewing questionnaire was used as a tool which included sociodemographic, obstetric characteristics, and follow-up data. Findings of the study revealed that there were significant differences between both the groups regarding post-cesarean section recovery variables, which included analgesics required, self-void after catheter removal, breastfeeding, oral hydration, and first flatus passed after exercises as per the independent *t*-test ($P < 0.05$). The study results proved that the early and progressive exercises had an effective role in improving post-cesarean section recovery.[9]

The above study findings are also supported by a study conducted to find the association between early ambulation and post-operative recovery in primiparous post-cesarean mothers. Total 124 samples were included in the study and were selected by random sampling technique, divided into two groups, experimental and control group. The study design used was randomized controlled trial. In the experimental group, the researcher assessed the pain level and initiated early ambulation after 6 h of surgery, and post-operative recovery was assessed by structured observational schedule for first 5 post-operative days, whereas, in control group, mothers were ambulated after 18 h of surgery as per the hospital protocol. The results revealed that there is a significant difference between the mean post-operative pain score after ambulation among experimental and control group at the level of <0.05. Hence, the research hypothesis got accepted and proved that early ambulation was effective in post-operative recovery among primiparous post-cesarean mothers and enables nurses to involve in assisting in early ambulation. The findings of the study also revealed that there was significant association between the early ambulation and post-operative recovery in primiparous post-cesarean mothers with selected demographic variables.[10]

A quasi-experimental study was conducted on the effectiveness of early ambulation on postoperative recovery among the cesarean mothers. The research design was quasi-experimental post-test only control group design. Total 80 cesarean mothers were enrolled in the study by simple random sampling technique, 40 each in study and control group. Data were collected 1 time every day for 4 consecutive days after given interventions and the post-operative recovery was assessed in both the groups using observation. Pain score was assessed using numerical rating scale. The results of the study showed that there was significant difference between the mean post-operative pain score from post-operative day 0 to post-operative 3 after ambulation among study and control group as shown by the *P*-value ($P = 0.001$–$P < 0.001$). Here, the study concludes that early ambulation is effective in post-operative recovery among cesarean mothers.[11]

A quasi-experimental study was done on the impact of the early and late ambulation on the maternal outcome of mothers with cesarean birth in a selected hospital in Mangalore. Fifty mothers with cesarean birth who met the inclusion criteria were included in the study and were randomly assigned to Group I and Group II (25 in each group). Practice questionnaire and observation checklist were used as tools. Data were analyzed using descriptive statistics, unpaired *t*-test, and Fisher's exact test. The results revealed that the computed *t*-value shows a significant difference in the maternal outcome of mothers with cesarean birth in Group I and Group II and there was no significant association between the maternal outcome of mothers with cesarean birth and selected variables. Therefore, the study concludes that early ambulation is effective method in improving the maternal outcome of mothers with cesarean birth.[12]

A study was done to analyze the effectiveness of postnatal exercise in improving the functional status of cesarean women at the department of physiotherapy, ACS general hospital. The study was done in a randomized control trial design, and constituted of total 40 participants divided into two groups, experimental group and control group, each group containing 20 post-cesarean mothers. Inventory of functional status after childbirth scale was used as tool for data collection. The data were then evaluated and statistically analyzed. The results showed that there was significant difference between the pre-test and post-test values in both the groups. The experimental group had a highly significant post-test values when compared to control group. This ensures the effectiveness of postnatal exercise program. Therefore, the study concludes that the postnatal exercise program can be used in post-cesarean women to restore the functional health status as early as possible.[13]

A quasi-experimental study was conducted on effectiveness of planned teaching program on practice of postnatal exercises among mothers who have undergone LSCS in Bangalore. Total 50 post-cesarean mothers who have undergone LSCS were divided into two groups, experimental and control group, each containing 25 participants were enrolled in the study using random sampling technique by lottery method. The tool for study comprised an observational checklist and a planned teaching program on practice of postnatal exercise among LSCS mothers. The results of the study showed that in post-test, the control group had inadequate practice score with a mean of 16.33%, standard deviation of 9.44, and mean percentage of 19.60%, whereas, in post-test, the experimental group had significant mean practice score gain of 39.84% and standard deviation of 12.58 and mean percentage 79.67% with a difference of 60.07%. Thus, the study concluded the significant difference between the experimental and control group practice score of mothers in all areas of postnatal exercises.[14]

A quasi-experimental study was conducted on improving nurses knowledge and attitude regarding early mobilization

of post-operative patients in Lahore. It consisted of pre-survey, educational intervention, and post-survey design. The pre-survey and post-survey included eight knowledge-based questions and five option-based questions, whereas educational intervention integrated knowledge obtained from review of literature in form of 25 min power point presentation. Total 109 participants were included in study for data collection and a visual analog scale was used. The results of the study showed that all the nurses were correctly responded in both pre-survey and post-survey to questions regarding the complications of immobility and positive effect of early mobilization of post-operative patients.[15]

Conclusion

The findings of the study indicated that the early ambulation and progressive exercise is effective in experimental group as compare to control group.

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Conflicts of Interest

There are no conflicts of interest to disclose.

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