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## RESEARCH ARTICLE

# EFFECTIVENESS OF EARLY AMBULATION ON POST-OPERATIVE RECOVERY AMONG CAESAREAN MOTHERS

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**ABSTRACT**

***Background:*** Cesarean section is a major abdominal surgery and may entail more discomfort, longer recovery and difficulty returning to normal activity than vaginal delivery. Early mobilization was the most significant nursing intervention for improving post-operative outcomes including enhancing pain relief, promoting wound healing, prevention of deep vein thrombosis, reducing hospital stay, and expediting recovery and return to normal activity. ***Objective*****:** The current study was undertaken to assess the effectiveness of early ambulation on post-operative recovery among caesarean mothers. ***Materials and Methods:*** The research design was quasi-experimental post-test only control group design. Total 80 caesarean mothers were enrolled by simple random sampling technique, 40 in each study and control group. The intervention early ambulation at 6 hours after caesarean section was given for 3 consecutive days to study group whereas control group was ambulated as per routine care. Data were collected one time everyday for 4 consecutive days after given intervention. Post-operative recovery was assessed in both groups by using observation Schedule including wound healing, fundal height and activity of daily living. Pain score was assessed with numeric pain rating scale. ***Results***: The results revealed that there was significant difference between the mean post-operative pain score from POD 0 to POD 3 after ambulation among study and control group as shown by p-value ($p=0.001$ to $p<0.001$). On wound healing parameter there was significant difference seen in discharge, redness, swelling at p-value 0.002, 0.029,0.017 respectively except separation as p-value was 0.317. Similarly fundal height had been significantly decreased from POD 1 to POD 3 at p-value ($p=0.010$ to $p=0.001$). In activity of daily living highly significant difference were seen from POD 0 to POD 3 at p-value ($p<0.001$). Statistically no significant association was found of post-operative recovery among caesarean mothers with selected demographic variables and obstetrics characteristics at ($p>0.05$) level. ***Conclusions*****:** Therefore the study concluded that early ambulation was effective in postoperative recovery among caesarean mothers.



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## INTRODUCTION

Caesarean section is a surgical procedure whereby the foetuses after the end of 28 weeks are delivered through an incision made on abdominal and uterine walls. This is the exclusion of delivery through an abdominal incision of a foetus lying free in the abdominal cavity following uterine rupture. Often it is performed when there is a chance of complication through vaginal delivery and risk of mother's or baby's life or health but in recently it has been also performed upon request of maternal for childbirths that would otherwise have been natural (Finger, 2003). Use of caesarean section by the doctors to deliver babies, has nearly doubled in 15 years to reach "alarming" proportion in some countries. A study says, rates of birth from about 16 million (12%) in 2000 to an estimated 29.7 million (21%) in 2015. The nation with the highest rate for using the surgery to assist childbirth is the Dominican Republic with 58.1% cases (http://www. newindian express.com/world/2018/oct/12/c- section- births- surge- to -ala rming-rates-worldwide-study-1884651.html). In US, rate was 22.7% in 1990 which increased to 27.5% in 2003 and it was 32.8% in 2014 (Saint Hedwige, 2016). These high levels are also reported in Latin America & Caribbean; it ranged from 32.3% in 2000 & 44.3% in 2015. The estimate for Caesarean Section rates in East. Asia also shows that it is well above 28.8% (Howard, 2018). In some countries, CS rates are up to 50%, mainly in the private sector, including Brazil (55.5% in 2015), Iran, and Mexico, resulting in millions of women undergoing un necessary surgery. The rate of caesarean section in Egypt increased from 4.6% in 1990 to 51.8% in 2014 (Betran *et al.,* 2016). The main cause of increasing CS rates was fear of pain (57.8%). In primipara, the main cause for requesting CS is fear of pain that caused an increase to 62.5%, on the other hand, in multipara, the main cause for CS was bad history of previous experience (60%) cases followed by fear of pain in 50% cases and also fear of pelvic floor injuries 50% cases in multipara vs. 20% in primipara (Zakherah *et al.,* 2019). The WHO considers that the best caesarean section rate is between 10-15%. Health personnel have to do responsibility to maintain this number, currently, when in the most of countries the rate is higher (WHO, 2015). The caesarean rates have increased dramatically in the developed countries. In India data collected from the National Family Health Survey (NFHS).Caesarean section deliveries analyzed from 1992-1993 to 2015-2016, In 1992-93 Caesarean section rate has increased approximately 2.9% and 7.1 percent in 1998-99 and again rise to 8.5% in 2005-06 and a steady rise to 17.2% in 2015-16. The rate of CS in Telangana is higher than Brazil (Radhakrishnan *et al.,* 2017). The factors

associated with caesarean section are age, parity, multiple pregnancy, maternal weight gain, birth weight and elderly primigravida. Except these demographic and medical reasons the patient request and the physician factor are also playing a major role to increase caesarean section rates (Pai, 2000). The woman who has undergone caesarean section has to undergo through more problems, minor or major, than a woman with vaginal delivery. Some problems are like longer time of hospital stay, postoperative pain, late ambulation, increased time required to return to normal activity of daily living, breast engorgement, problems in bladder and bowel, lactation failure, and less mother & newborn bonding. The patients recovering after caesarean section may limit their activities due to pain, fatigue or discomfort who is interfering with their ability to regain their previous level of functioning (Ghosh and James, 2010). Immobility after caesarean section can effect the women physically and mentally, the physical effect may include urinary tract infection, deep venous thrombosis, bowel obstruction, increased pain intensity and pressure ulcer. Mental effect appears in the presence of different levels of depression. In spite of, early ambulation have major benefits like to increase functional activity, muscle tone strengthens, reducing pain intensity, involution of the uterus, lochial discharge,gastrointestinal and urinary tract function, re-establishment and improvement of wound healing (Kaur *et al.,* 2015).

In the immediate postoperative period, the woman is monitored for uterine atony, excessive vaginal or incision bleeding, and oliguria. Early ambulation first practiced in 1946, which is important for the post caesarean mother to prevent so many complications after surgery (Van Stralin and Terveer, 2007). Early ambulation in post operative period is the key to get rapid and maximum muscle function and restoration of mother's health. Early ambulation is the most significant general nursing measure to prevent postoperative complications by ensuring better blood circulation, promoting gastric motility, enhancing respiration, decreasing chances of thrombophlebitis, preventing orthostatic hypotension, improving the physical strength, coordination and independence etc. (Brunner and Suddarth's, 2008). Thromboembolism is one of the common and major complication during puerperium. Consequently women should be encouraged to wake up from the bed as early as possible in order to prevent thrombosis. However, many patients can not be fully ambulatory soon after surgery (Sharma and Monga, 2008). Rana *et al*. (2019) Conducted a quasi experimental study to assess the effectiveness of early ambulation in post operative recovery among cesarean section mothers. Total 60 samples were selected for this study. Pain was assessed by numerical pain rating scale and checklist for maternal outcome was used to collect the data. Result revealed that the pretest mean maternal outcome and pain level in experimental group was 2.50 and 8.40 whereas in control group it was 2.47 and 8.53 respectively. On all the 4 days the tabulated t value was more than the calculated t value. There is a significant difference in the maternal outcome and pain level between both the groups. There was no association between post operative recovery and socio demographic variables. Thus, the study concluded that early ambulation has a significant impact on post operative recovery among women with CS delivery (Rana Banita *et al*., 2019). Each day the particular patient is encouraged to increase physical activity and to be as independent as possible. This is personal hygiene, getting in and out of bed without assistance and walking. Early ambulation aids in the restoration of normal bowel functions allows patients to move easily pass flatus and stool and resume normal bowel habits. The investigator through her experience has observed that the time of maternal ambulation after caesarean section differ in every hospital. It has not been practiced in many hospitals in India. No much research is done in this particular area also. Addressing the specific needs of the post caesarean woman, facilitating early ambulation may help her to overcome the challenges and barriers that she has to face post caesarean women. The research studies created an insight in the investigator that there is lack of practice regarding early ambulation among mothers after caesarean section. So, the researcher interested to study the effect of early ambulation among post caesarean mothers.

**Scope of the study**

- It is necessary to encourage early ambulation, which facilitate rapid tissue recovery as well as returning of normal day to day functions.
- This study can have great implications in nursing education which can guide nurses and nursing students in providing teaching to patients which can aid in providing care independently.
- It promotes wound healing process in post operative recovery by early ambulation and its prevent from thromboembolism.
- It helps in better circulation, promoting gastric motility, enhancing respiration, improving physical strength and independence etc.
- If it is practiced regular and effectively then many post-operative complication can be reduced and motherhood can be made more acceptable.
- This will also reduced the cost of hospital stay which is very effective in developing country like India.
- By practicing caesarean mother are encouraged to take care of young one which is good for self care and baby also.
- It reduces overall burden of family.
- This can stimulate further research in the field.

**OBJECTIVES**

- Tocompare the post-operative recovery among caesarean mothers in study group & control group.
- To know the association of post test level of post-operative recovery among caesarean mothers with selecteddemographicvariables& obstetrics characteristics in study group & control group.

**HYPOTHESIS**

**$H_0$-** There is no significant difference between the post test of post-operative recovery among caesarean mothers in study & control group.

**$H_1$-** There is a significant difference between the post test of post-operative recovery among caesarean mothers in study & control group.

**$H_2$-** There is a significant association between post test of post-operative recovery among caesarean mothers with the selected demographic variables & obstetrics characteristics in study & control group.

## MATERIAL AND METHODS

***Research Design:*** Quasi experimental post-test only control group design.

***Research setting:*** Post natal ward at Queen Mary's KGMU Lucknow.

***Population:*** Post caesarean section mothers of Queen Mary's hospital Lucknow.

***Sample size and Sampling technique:*** 80 Post caesarean mothers and Simple Random sampling.

**Sample criteria**
**Inclusion criteria**

- Mothers who are admitted in Queen Mary's K.G.M.U. Lucknow.
- Mothers who have undergone elective caesarean section.
- Mothers who have undergone spinal anaesthesia.
- Mothers who are able & willing to participate in study.
- Mothers who are able to follow instructions.
- Both primi and multi mothers after caesarean section.

**Exclusion criteria**

- Mothers who are having other medical problems like (cardiac problem, respiratory problem, Eclampsia etc) & gynaecological problems (PPH, Pueperial sepsis , Hysterectomy etc)
- Patients who have doctors order for strict bed rest.
- Unconscious & disoriented patient.

**VARIABLES**

***Independent variable:*** Early ambulation
***Dependent variable:*** Post operative recovery

**Tool and method of data collection**

***Section 1.*** Demographic Variables and obstetrics characteristics.
***Section 2.*** Numerical pain rating scale and Observation Schedule for post caesarean section recovery parameter.

***Selection and Development of tool:*** Post-operative recovery tool is a structured tool. The tool was developed after extensive review of literature, internet search, and expert advice helped the investigator to select the suitable scale to assess post-operative recovery among post caesarean mothers. Numerical pain rating scale and Observation Schedule related to post-operative recovery was prepared for collection of data.

***Description of the Tool:*** The tool consists of following parts.

***Section1. Demographic Variables and Obstetrics Characteristics:*** The Demographic Variables and Obstetrics Characteristics was self structured tool. It contains 4 items such as age, education, occupation, types of family in demographic variables and 5 items such as parity, previous delivery of mother, number of prior caesarean section, time period between 2 pregnancy, period of gestation(week) in obstetrics characteristics with their most suitable responses. It is structured tool in which the most appropriate response has to tick and some open ended questions was also has to be completed by investigator.

***Section 2. Numerical pain rating scale and Observation Schedule for post caesarean section recovery parameter:*** It consists of 4 parameter such as pain, wound healing, fundal height and activity of daily living.

***Section 2A: Pain:*** It's a straight line defining 11-point numeric scale ranges from '0' representing no pain to '10' representing extreme pain. This scale is used to assessed the level of pain. The numeric pain rating scale is modified by me. The researcher write appropriate score based on patient's response. This section consists 3 main components such as mild, moderate and severe pain. These 3 components are divided into 11 parts. No pain scores 0. Mild pain includes score between 1-3. Moderate pain includes score 4-6 and severe pain includes score of 7-10. Maximum score was 10 and minimum score was 0.

**Criterion measures to assess pain level**

| S. No | Level of Pain Score | Percentage |
|---|---|---|
| **1.** | No pain 0 | 0 |
| **2.** | Mild pain 1-3 | 10-30% |
| **3.** | Moderate pain 4-6 | 40-60% |
| **4.** | Severe pain 7-10 | 70-100% |

Maximum score: 10; Minimum score: 00

***Section 2B: Wound healing:*** On the 1st removal of dressing, the characteristics of wound healing will be assessed. It include 4 parameter such as redness, swelling, discharge and Separation/dehiscence. The wound scale is modified by me. Researcher write appropriate score based on assessment. The minimum score is '0' and maximum score is '12'.

***Section 2C: Fundal height:*** The fundal height is assessed by noting the height of the fundus of the uterus in relation to the symphysis pubis. Bladder should be emptied and the womens positioned flat on her back (supine). The researcher places one hand on the abdomen and presses to find out the hard mass, after finding out the fundus of uterus researcher use measuring tape and measurement taken from the top of the uterus to above the symphysis pubis and scored. Normal- decreases 1 cm daily & Abnormal- not decreases 1 cm daily

***Section 2D: Activities of daily living:*** Consisted of items on activities of daily living among the post-caesarean mothers such as oral hygiene, bathing, toileting, changing the dress, combing the hair, eating, walking, Getting into/out of bed or a chair, Holding the baby & care of the baby, Breast feeding. By observing the patients undergone caesarean section, every 24 hours after the surgery.

***Pilot study:*** The pilot study was conducted in the month of November for the period of two week (05.11.2018 to 19.11.2018) from 8 am to 1 pm at Queen Mary's hospital (Department of Obstetrics and Gynaecology) KGMU, Lucknow. The sample size was 10 and they were selected by using simple random sampling technique, in that 5 of them were allotted to experimental and 5 of them to control group.

***Reliability of the Tool:*** It is the degree of consistency or dependability with which an instrument measures the attributes. Reliability was established by the Cronbach's Alpha method.

1. **Numeric pain Rating Scale (NRS)** Is standardized tool, the reliability of the scale was based on the assessment of test-retest reliability & it has been 0.95 and 0.96 which show highly significant for measurement of post-operative pain.
2. **Wound healing** is modified tool, the reliability of the wound healing is 0.839
3. **Fundal height** is modified tool, the reliability of the fundal height is 0.804
4. **Activities of daily living** is modified tool, the reliability of the activity of daily living is 0.774.

Acceptable cutt off value of coefficients was between 0.7 and 0.8. This indicate that the tool which was used in the study was reliable.

***Data Collection Procedure:*** First of all ethical permission was obtained from the ethics committee of KGMU, Lucknow & a formal permission was obtained from the departmental head (HOD of Obstetrics and Gynaecology) KGMU, Lucknow for conducting main study. During the data collection procedure the investigator established rapport with post Caesarean section mothers. They were assured that no physical or emotional harm would be done in the course of study. Written consent was taken from all the samples and procedure was explained to them. The study group

were given early ambulation at 6 hours after caesarean section for twice a day for 3 consecutive post-operative day (0 POD, 1POD and 2POD) whereas in control group followed hospital routine care. The Early ambulation procedure had many steps such as mild deep breathing exercise, movement of upper & lower extremity, side turn, propped up position, upright sitting position, dangling of legs, stand /walking. Data pertaining to the demographic variables & obstetrics characteristics were collected by interview method. Post test data were collected from both groups for 4 POD (0 POD, 1POD, 2POD and 3POD). The investigator assessed the post-operative recovery such as pain, wound healing, fundal height, activity of daily living. Data collected was analyzed by using both descriptive and inferential statistics.

**Ethical consideration**

- A formal written permission obtained from the institutional research ethical committee of King George's Medical University.
- Written formal permission was obtained from the departmental HOD's of Obstetrics & Gynaecology to conduct the study.
- Informed consent was taken from all samples to be a part of the study. The subjects were informed that the participation was voluntary. They were also informed that they can withdrawn from the study at any time. Confidentiality and anonymity of information was maintained.

**Plan of Data Analysis**

- Analysis of data were based on the basis of objectives, hypotheses, and by using descriptive and inferential statistics and the following plan for analysis should be worked out.
- Data of the demographic variables & obstetrics characteristics will be analyzed by frequency distribution and percentage distribution to describe sample characteristics.
- Calculation average score of mean, SD, and Mann whitney test, t-test por post-operative recovery parameter.
- Computing the chi-square method to establish the correlation between selected demographic and obstetrics characteristics.

## RESULTS

Table (1) described about the frequency, percentage distribution of demographic variables of caesarean mothers with respect to age, education status, occupation, type of family. Out of the 80 caesarean section mothers the finding suggested of the study with selected demographic variables that the majority of the samples were belong to age group 24-29 years of age with 25(62.5%) and 1(2.5%) were >35years of age , studied in graduate and above education with 21(52.5%) , maximum women were housewives(not working) with 38(95.0%), majority were belong to the Joint family with 30(75.0%) whereas in the control groups, majority of samples were similar in age group 24-29 years of age with 20(50.0%) and none of them in the age group of >35years, studied in graduate and above education with 21(52.5%), maximum women were housewives(not working) with 37(92.5%), majority were belong to the Joint family with 31(77.5%). Table (2) Describes about the frequency, percentage distribution of Obstetric Characteristics of caesarean mothers with respect to parity, previous delivery of mother, number of prior caesarean section , time period between 2 pregnancy and period of gestation. With regards to the parity in the study group 19(47.5%) were primiparous and 21(52.5%) were multiparous while in Control group 22(55.0%) were primiparous and 18(45.0%) were multiparous. With regards to the previous delivery of mother in the study group 6(28.6%) deliveries were normal vaginal while 15(71.4%) were lower segment caesarean section whereas in the Control group 3(17.6%) deliveries were normal vaginal and 14(82.4%) were lower segment caesarean section. Majority of caesarean deliveries had one previous caesarean section in study group 11(73.3%) and in control group 13(92.9%). Majority of the samples time period between 2 pregnancy were 1-3 years in both study group 9(42.9) and control group 8(47.1). Majority 28(70.0%) had period of gestation in study group in >36 weeks, while in the Control group majority 29(72.5%) had period of gestation in >36 weeks.

***Comparison of post-operative recovery among caesarean mothers in study & control groups***

Table (3) revealed that the mean pain scores of study group at POD 0, POD 1, POD 2 and POD 3 were 5.08±0.73, 3.95±0.78, 2.60±0.50 and 1.30±0.46 respectively, while mean pain scores of control group at POD 0, POD 1, POD 2 and POD 3 were 5.63±0.59, 4.55±0.68, 3.20±0.61 and 2.10±0.55 respectively. The result showed that there was a significant changes in the post-test pain level scores between the study and control group in relation to early ambulation were observed at POD 0 ($p=0.001$), POD 1 ($p=0.001$) and highly significant changes were found at POD 2 ($p<0.001$) and POD 3 ($p<0.001$). It was inferred that, the post-test mean score of pain score were least in the study group than control group. Also the early ambulation made significant difference in pain. Table (4) revealed that mean discharge score of the control group was 0.50(1.01) and none in study group. The mean redness score of the study group was 0.13(0.33) and of the control group was 0.38 (0.59). The mean swelling score of the study group was 0.08(0.27) and of the control group was 0.33(0.57). The mean separation score of the study group was none and of the control group was 0.03(0.16).

Significant difference was found between study and control groups in mean Discharge score ($p=0.002$), in mean redness score ($p=0.029$), in mean swelling score ($p=0.017$) and no significant difference in mean swelling score was found between study and control group ($p=0.317$). The result showed that there was a significant difference in the post-test wound healing status between the study and control group in relation to early ambulation were observed for discharge, redness, swelling & over all as well $p<0.05$ except separation. Also the early ambulation made significant difference in wound healing. Table (5) depicted that the mean fundal height scores of study group at POD 0, POD 1, POD 2 and POD 3 were 17.15±1.42, 16.29±1.43, 15.44±1.46 and 14.46±1.47 respectively, while mean fundal height scores of control group at POD 0, POD 1, POD 2 and POD 3 were 17.53±1.01, 17.04±1.07, 16.40±1.10 and 15.48±1.11 respectively. The result showed that the post-test mean scores of fundal height reported in the study group at POD 0 to POD 3 were decrease than control group in aspect of early ambulation and significant difference in the post-test fundal height scores between the study and control group in relation to early ambulation were observed at POD 1 ($p=0.010$), POD 2 ($p=0.001$) and POD 3 ($p=0.001$). Table (6) reveals that the mean activity of daily life scores of study group at POD 0, POD 1, POD 2 and POD 3 were 12.00±1.88, 20.13±3.11, 27.63±2.53.

**Table 1. Distribution of sample based on demographic variables in study and control groups.**

**n=80**

| S.No. | Demographic Variables | Categories | Study Group ($n_1$=40) f (%) | Control Group ($n_2$=40) f(%) |
|---|---|---|---|---|
| 1 | Age | 18-23 | 7(17.5%) | 12(30.0%) |
| | | 24-29 | 25(62.5%) | 20(50.0%) |
| | | 30-35 | 7(17.5%) | 8(20.0%) |
| | | >35 | 1(2.5%) | 0 (0.0%) |
| 2 | Education | Illiterate | 0(0.0%) | 0(0.0%) |
| | | Primary | 7(17.5%) | 6(15.0%) |
| | | Secondary | 5(12.5%) | 6(15.0%) |
| | | Higher -secondary | 7(17.5%) | 7(17.5%) |
| | | Graduation & Above | 21(52.5%) | 21(52.5%) |
| 3 | Occupation | Working | 2(5.0%) | 3(7.5%) |
| | | Not working (Housewife) | 38(95.0%) | 37(92.5%) |
| 4 | Types of –family | Joint | 10(25.0%) | 9(22.5%) |
| | | | 30(75.0%) | 31(77.5%) |

**Table 2. Distribution of the Subject as per Obstetric Characteristics in study and control groups.**

**n=80**

| S. No. | Demographic Variables | Categories | Study Group ($n_1$=40) f (%) | Control Group ($n_2$=40) f (%) |
|---|---|---|---|---|
| 1. | Parity | Primiparous | 19(47.5) | 22(55.0) |
| | | Multiparous (if yes) | 21(52.5) | 18(45.0) |
| 1.1. | Previous delivery of mother | Normal vaginal delivery | 6(28.6) | 3(17.6) |
| | | Lower segment caesarean section(if yes) | 15(71.4) | 14(82.4) |
| 1.2 | Number of prior caesarean section | Previous 1 | 11(73.3) | 13(92.9) |
| | | Previous 2 or more | 4(26.7) | 1(7.1) |
| 1.3 | Time period between 2 pregnancy | 1-3 years | 9(42.9) | 8(47.1) |
| | | 4-6 years | 9(42.9) | 7(41.2) |
| | | >6 years | 3(14.3) | 2(11.8) |
| 2. | Period of gestation (week) | 32-34 | 2(5.0) | 4(10.0) |
| | | 34-36 | 10(25.0) | 7(17.5) |
| | | >36 | 28(70.0) | 29(72.5) |

**Table 3: Comparison of Mean and Standard Deviation of the post-operative pain scores among caesarean mothers in study & control group**

| PAIN SCORES (Numeric pain rating scale) | Study group Mean | SD | Control group Mean | SD | U-value | p-value |
|---|---|---|---|---|---|---|
| POD 0 | 5.08 | 0.73 | 5.63 | 0.59 | 491.50 | 0.001 |
| POD 1 | 3.95 | 0.78 | 4.55 | 0.68 | 481.00 | 0.001 |
| POD 2 | 2.60 | 0.50 | 3.20 | 0.61 | 420.00 | <0.001 |
| POD3 | 1.30 | 0.46 | 2.10 | 0.55 | 272.00 | <0.001 |

Mann Whitney*p<0.05

**Table 4: Comparison of Mean and Standard Deviation of the Post-test level of Wound Healing Status among post-caesarean mothers in study & control group**

| WOUND HEALING | group Mean | SD | Control group Mean | SD | U-value | p-value |
|---|---|---|---|---|---|---|
| DISCHARGE | 0.00 | 0.00 | 0.50 | 1.01 | 620.00 | **0.002** |
| REDNESS | 0.13 | 0.33 | 0.38 | 0.59 | 635.00 | **0.029** |
| SWELLING | 0.08 | 0.27 | 0.33 | 0.57 | 637.00 | **0.017** |
| SEPARATION | 0.00 | 0.00 | 0.03 | 0.16 | 780.00 | 0.317 |
| Overall | 0.20 | 0.56 | 1.23 | 2.04 | 616.00 | **0.015** |

Mann Whitney*p<0.05

**Table 5: Comparison of Mean and Standard Deviation of the Post-test level of Fundal Height among caesarean mothers in Study and Control Groups**

| FUNDAL HEIGHT | Study group Mean | SD | Control group Mean | SD | t-value | p-value |
|---|---|---|---|---|---|---|
| POD 0 | 17.15 | 1.42 | 17.53 | 1.01 | -1.36 | 0.179 |
| POD 1 | 16.29 | 1.43 | 17.04 | 1.07 | -2.66 | **0.010** |
| POD 2 | 15.44 | 1.46 | 16.40 | 1.10 | -3.33 | **0.001** |
| POD 3 | 14.46 | 1.47 | 15.48 | 1.11 | -3.47 | **0.001** |

Unpaired 't' test *p<0.05

**Table 6: Comparison of Mean and Standard Deviation of the Post-test level of Activity of Daily Living among caesarean mothers in Study and Control Groups**

| Activity of daily living | Study group Mean | SD | Control group Mean | SD | U-value | p-value |
|---|---|---|---|---|---|---|
| POD 0 | 12.00 | 1.88 | 10.03 | 0.16 | 248.50 | <0.001 |
| POD 1 | 20.13 | 3.11 | 16.85 | 2.54 | 318.50 | <0.001 |
| POD 2 | 27.63 | 2.53 | 24.25 | 2.82 | 289.00 | <0.001 |
| POD 3 | 29.88 | 0.40 | 28.55 | 1.54 | 369.50 | <0.001 |

Mann Whitney*p<0.05

**Table 7: Comparison of Overall Post-operative recovery based on Final post-operative recovery score in study and control group**

| Group | Above Median(>52.08) No. | % | Below Median (<52.08) No. | % | chi sq | p-value |
|---|---|---|---|---|---|---|
| **Study** | 26 | 65.0% | 14 | 35.0% | 7.20 | **0.007** |
| **Control** | 14 | 35.0% | 26 | 65.0% | | |

Chi square*p<0.05

**Table 8: Association of Post-operative recovery with Demographic Variables in study and control combined groups**

| Variable | Category | Above Median (>52.08) No. | % | Below Median (<52.08) No. | % | chi sq | p-value |
|---|---|---|---|---|---|---|---|
| Age Group | 18-23 years | 7 | 17.5% | 12 | 30.0% | 5.78 | 0.123 |
| | 24-29 years | 21 | 52.5% | 24 | 60.0% | | |
| | 30-35 years | 11 | 27.5% | 4 | 10.0% | | |
| | > 35 years | 1 | 2.5% | 0 | 0.0% | | |
| Education | Primary | 8 | 20.0% | 5 | 12.5% | 1.07 | 0.785 |
| | Secondary | 5 | 12.5% | 6 | 15.0% | | |
| | Higher secondary | 6 | 15.0% | 8 | 20.0% | | |
| | Graduate & above | 21 | 52.5% | 21 | 52.5% | | |
| Occupation | Working | 2 | 5.0% | 3 | 7.5% | | |
| | Not working | 38 | 95.0% | 37 | 92.5% | 0.21 | . 644 |
| Type of Family | Nuclear | 8 | 20.0% | 11 | 27.5% | 0.62 | 0.431 |
| | Joint | 32 | 80.0% | 29 | 72.5% | | |

Chi square*p<0.05

**Table 9: Association of Overall Post-operative recovery with Obstetrics Characteristics in study and control combined groups**

| Variable | Category | Above Median (>52.08) No. | % | Below Median (<52.08) No. | % | chi sq | p-value |
|---|---|---|---|---|---|---|---|
| Parity | Primiparous | 21 | 52.5% | 20 | 50.0% | 0.05 | 0.823 |
| | Multiparous | 19 | 47.5% | 20 | 50.0% | | |
| Previous delivery | Normal vaginal delivery | 3 | 15.8% | 6 | 31.6% | | |
| | Lower segment caesarean section | 16 | 84.2% | 13 | 68.4% | 1.31 | 0.252 |
| Number of prior caesarean section | Previous 1 | 12 | 75.0% | 12 | 92.3% | 1.51 | 0.220 |
| | Previous 2 or more | 4 | 25.0% | 1 | 7.7% | | |
| Time period between 2 pregnancy | 1-3 years | 9 | 47.4% | 8 | 42.1% | 0.26 | 0.879 |
| | 4-6 years | 8 | 42.1% | 8 | 42.1% | | |
| | >6 years | 2 | 10.5% | 3 | 15.8% | | |
| Period of gestation (week) | 32-34 wk | 2 | 5.0% | 4 | 10.0% | 1.64 | 0.442 |
| | 34-36 wk | 7 | 17.5% | 10 | 25.0% | | |
| | >36 | 31 | 77.5% | 26 | 65.0% | | |

Chi square*p<0.05

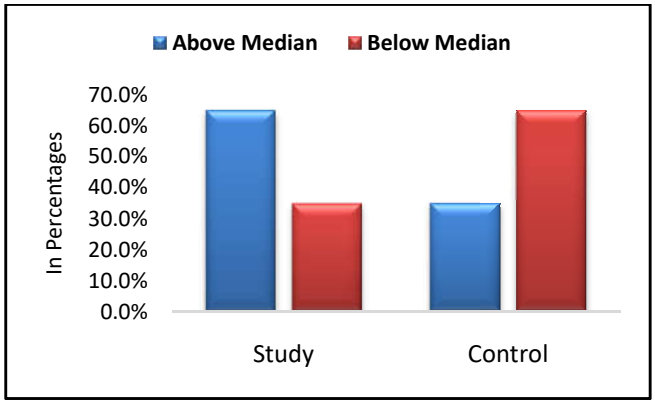


**Fig 1: Comparison of Overall Post-operative recovery based on the Final Post-operative recovery Score in study and control groups.**

and 29.88±0.40 respectively, while mean activity of daily life scores of control group at POD 0, POD 1, POD 2 and POD 3 were 10.03±0.16, 16.85±2.54, 24.25±2.82 and 28.55±1.54 respectively. The result showed that there was a highly significant difference in the post-test activities of daily living scores between the study and control group in relation to early ambulation were observed at POD 0 (p<0.001), POD 1 (p<0.001), POD 2 (p<0.001) and POD 3 (p<0.001) . It was inferred that, the post-test mean score of activities of daily living were higher in the study group than control group. Table (7) depicted that on comparing the overall post-operative recovery based on the final post-operative recovery score it was found that in study groups 65.0% cases got post-operative recovery score above the median score while in the control group only 35.0% cases got post-operative recovery score above the median score. The study group showed significantly more post-operative recovery than the control group in aspect of early ambulation (p=0.007). Therefore the research hypothesis $H_1$ was accepted that there is a significant difference between the post test level of post-operative recovery among caesarean mothers in study and control group.

***Association of post test level of post-operative recovery among caesarean mothers with selected demographic variables and obstetrics characteristics in study & control groups***

Table (8) and (9) depicted that on studying the association of overall post-operative recovery with demographic variables and obstetrics characteristics, none of the demographic variables and

obstetrics characteristics showed significant association with the overall post-operative recovery ($p>0.05$) in relation to early ambulation. Therefore the research hypothesis $H_2$ was rejected. It was inferred that the selected demographic variables and obstetrics characteristics of caesarean mothers undergone LSCS did not influence the post-test of post-operative recovery in study and control group.

## DISCUSSION

The research study had been discussed based on the objectives and the following supported studies

***The first objective was to compare the post-operative recovery among caesarean mothers in study group & control group:*** The obtained p value between experimental and control group posttest Pain scores were POD 0 ($p=0.001$), POD 1 ($p=0.001$), POD 2 ($p<0.001$) and POD 3 ($p<0.001$). Hence the research hypothesis states that there was significant in the post-test of pain score among study and control group was accepted at $p<0.05$ level. The finding of the present study revealed that the mean post-operative pain score after ambulation was reduced significantly in study group as compared to mean pain score in control group. These findings were accordance to the study conducted by Chaudhary (2012) Conducted a quasi experimental study on effectiveness of structured teaching programme about the knowledge of mothers on early ambulation and its impact on the recovery after caesarean section. Total 60 caesarean mothers were selected by purposive sampling technique, which concluded that the mean suture pain score of caesarean section mothers in control group was higher than experimental group which indicated that early ambulation has a positive effect on reduction of post-operative pain (Chaudhary, 2012).

***The second objective was to know the association of post test level of post-operative recovery among caesarean mothers with selected demographic variables & obstetrics characteristics in study & control group:*** Data findings revealed that there was no statistically significant association of post-test level of post-operative recovery among study group and control group of caesarean section mothers with their selected demographic variables & obstetrics characteristics at $p>0.05$ level of significance. Similar study were reported by Andrade Reema J. (2017) Conducted a study on a study to assess the impact of early and late ambulation on maternal outcome of mothers with caesarean birth. An evaluatory approach with a quasi experimental time series design was adopted for the study. Sample consisted of 50 mothers with caesarean birth. Finding revealed that There was no significant association between the maternal outcome of mothers with caesarean birth and selected variables such as parity, education, income, type of operation and time of ambulation after surgery in group I ($p=2.04$, $p=0.21$, $p=2.12$, $p=0.15$, $p=0.65$; $p<0.05$) and group II ($p=0.051$, $p=0.12$, $p=0.08$, $p=8.48$; $p<0.05$) (Andrade *et al.,* 2017).

### Conclusion

The present study assessed the effectiveness of early ambulation on post-operative recovery among caesarean mothers. Based on the present study finding it was concluded that early ambulation was effective in post-operative recovery after caesarean section. Early ambulation at 6 hours can be initiated after caesarean section for speedy post-operative recovery and to prevent post-operative complications. Hence it s recommended that early ambulation can be incorporated into nursing practice in post natal ward as it can enhance the postoperative recovery and reduce the postoperative complications and for the benefit of patient and health care.

### Limitations of the study

- Only limited literatures and studies were obtained from the Indian context.
- Generalization will be better if large sample included.
- The intervention, assessment and implementation of effectiveness of early ambulation was done by the same person.

### Recommendations

- The study can be replicated on a large number of samples for better generalization.
- The study can be done to find the effect of early ambulation on different aspects.
- A similar study can be conducted in other surgical postoperative patients such as abdominal surgery, cardiac, thoracic surgery, orthopedic surgery and gynecological surgeries.
- The study can be done to assess the knowledge and practice of caesarean section mothers and also their attitude towards early ambulation.
- A similar study can be conducted with more variables like preoperative education, psychological preparedness regarding early ambulation.

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