**ORIGINAL RESEARCH ARTICLE**     **OPEN ACCESS**

# A STUDY TO ASSESS THE IMPACT OF EARLY AND LATE AMBULATION ON MATERNAL OUTCOME OF MOTHERS WITH CAESAREAN BIRTH IN A SELECTED HOSPITAL IN MANGALORE

## [1]Reema Jacqueline Andrade and [2]Rev. Sr. Aileen Mathias

[1]Dissertation submitted to Rajiv Gandhi University of Health Sciences, Bangalore, Karnataka
[2]Department of Obstetrics and Gynaecological Nursing Father Muller College of Nursing, Mangalore

## ABSTRACT

Caesarean section is a life-saving procedure and with the advances in anaesthetic services and improved surgical techniques, the morbidity and mortality of this procedure have come down considerably. Caesarean section is associated with risks of post-operative adhesions, wound infections and also poses a barrier to breast-feeding initiation. In a developing country like India, it is important to look at the interventions that will make a difference and facilitation of the early ambulation may help to overcome the challenges and barriers facing post caesarean women.

**Objectives of the study were:**

- To determine the impact of early ambulation on maternal outcome of mothers with caesarean birth (group I).
- To determine the impact of late ambulation on maternal outcome of mothers with caesarean birth (group II).
- To compare the maternal outcome among group I and group II.
- To determine the association between maternal outcome on the second postnatal day and selected variables in group I and group II.

**Methods:** An evaluatory approach with a quasi experimental time series design was used for the study. Sample consisted of 50 mothers with caesarean birth who met the inclusion criteria and they were randomly assigned to group I and group II (n=25 in each group).

Mothers in group I were ambulated 10 hours after caesarean birth and mothers in group II walked after 24 hours of delivery. . The tool used was a practice questionnaire and an observation checklist. Data was analysed using descriptive statistics, unpaired 't' test and Fisher's exact test.

**Results:** The mean breast feeding, rooming in and maternal feelings of wellbeing scores in group I (14) was higher than the mean breast feeding, rooming in and maternal feelings of wellbeing scores in group II (8.44) on the second postnatal day. The mean lochia scores in group I (268) was lower than the mean lochia scores in group II (248) on the second postnatal day. The computed 't' value showed a significant difference in the maternal outcome of mothers with caesarean birth in group I and group II. 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).

**Interpretation:** The result shows that early ambulation is an effective method in improving the maternal outcome of mothers with caesarean birth.

**Conclusion:** Early ambulation is a simple and a cost- free method that can be promoted by nurses' to be used by mothers after the caesarean birth.

## INTRODUCTION

"Do all the good you can, by all the means you can, in all the ways you can, in all the places you can, at all the times you can, to all the people you can, as long as ever you can"

-JOHN WESLEY

The experience of childbirth is beyond the physiological aspects. It has been said that it is more than just a usual day in a woman's life. This experience influences a woman's self-confidence, self-esteem, view of life, view of her relationship and view of her children. It can be one of the most influential experiences for a woman (Arjun, 2008). Breastfeeding is the healthiest, safest, and most nutritious method for feeding infants, with multiple benefits for mothers, including reduced postpartum bleeding and menstrual flow; improved blood sugar levels; faster postpartum weight loss and return of the uterus to its pre-pregnancy size; a facilitation of mother-infant bonding; reduced fertility, which facilitates family planning; and a reduced risk of osteoporosis, breast cancer, and ovarian cancer (Centers for Disease Control and Prevention. Breastfeeding, 2007). Thromboembolism is one of the common and major complications during puerperium. Therefore women should be advised to get out of bed as early as possible in order to prevent thrombosis. However, many patients cannot be fully ambulatory early after surgery (Sharma, 2008). Early ambulation after caesarean birth is considered to be important for mother child interaction. The mother should be encouraged to get up and try to go the bathroom within the first 24 hours after surgery. This will help to start the healing process (Karlstrom, 2007).

### Background of the study

The mortality rate for both caesarean sections and vaginal birth, in the Western world, continues to drop steadily. In 2000, the mortality rate for caesareans in the United States was 20 per 1,000,000. Women with severe medical conditions, or higher-risk pregnancies, often require a caesarean section which can distort the mortality figures (http://en.wikipedia.org/wiki/Caesarean_section). Over the last 20 years there has been a disturbing increase in the rate of Caesarean sections in India. It used to be a matter of pride to have low Caesarean section rates, especially in teaching hospitals. A collaborative study done by the Indian Council of Medical Research (ICMR) in the 1980s showed a Caesarean section rate of 13.8 per cent in teaching hospitals. Since Caesarean sections are one of the most frequently performed operations in women, any attempt to reduce morbidity, even with relatively modest differences for a particular outcome, is likely to have significant benefits in terms of costs and health benefits (Arjun, 2008).

As with all types of abdominal surgery, a Caesarean section is associated with risks of post-operative adhesions, incisional hernias and wound infections. If a Caesarean is performed under emergency situations, the risk of the surgery may be increased due to a number of factors. The patient's stomach may not be empty, increasing the anaesthesia risk. Other risks include severe blood loss (which may require a blood transfusion). Studies have shown that mothers who have their babies by caesarean take longer to first interact with their child when compared with mothers who had their babies' vaginally (http://en.wikipedia.org/wiki/Caesarean_section).

### Need for the study

Caesarean section is a life-saving procedure firmly ensconced in obstetric practice. With the advances in anaesthetic services and improved surgical techniques, the morbidity and mortality of this procedure have come down considerably. This has, albeit wrongly, emboldened obstetricians to perform more and more Caesarean sections, generating a universal upswing that has hit both developing and developed countries. Unfortunately, given our economic constraints, India is hardly equipped to handle the repercussions of such an unprecedented increase in surgical interventions (Arjun, 2008). The number of caesarean sections performed each year is increasing at a dramatic rate all around the world. Postoperative care of these women is an important aspect and demands due attention. Caesarean delivery poses a barrier to breast-feeding initiation related to delay in maternal-infant contact, maternal pain and exhaustion, less satisfaction with the birth experience, and even loss of self-esteem (DiMatteo et al., 1996). Since Caesarean sections are one of the most frequently performed operations in women, any attempt to reduce morbidity, even with relatively modest differences for a particular outcome, is likely to have significant benefits in terms of costs and health benefits. In an under-resourced country like India, it is important to look at interventions that will make a difference. The evidence-based strategies and interventions should be followed to reduce morbidity, the cost of the operation and benefit the patient (http://en.wikipedia.org/wiki/Caesarean_section).

Early ambulation (when the effects of anaesthesia have abated) and oral intake (within four to eight hours of surgery) are encouraged. Randomized trials have shown that these interventions enhance the return of bowel function, presumably by stimulating the gastrocolic reflex. Early initiation of feeding was associated with reduced time to return of bowel sounds, reduced post-operative hospital stay, and with suggestion of reduced abdominal distension (Malhotra, 2005). A review of the published articles on the treatment and postoperative management of obstetric fistulas in Nigeria was done. The world health organization estimated that about 2 million women are currently affected with obstetric fistulas worldwide and between 50,000 to 100,000 new cases occur annually. The objective was to determine the successful postoperative practices and strategies and that could be widely adopted. The article mentioned about the early postoperative care which included catheterization, vaginal pack, pain relief, fluid intake, urine output monitoring, antimicrobial use, vulvo-vaginal toileting and patient ambulation. The authors suggested that the practice of ambulation should be customized to meet the specific needs of the patients (Leonard, 2007). A study assessed if the women were less likely to breast feed after pregnancy complications in California. A retrospective cohort study of 26,781 women was conducted. Potential confounding variables were controlled with maternal, neonatal and obstetric characteristics. The result of the study showed that caesarean or operative vaginal deliveries both predicted a lower rate of breastfeeding (Lamar et al., 2007). A study assessed the breast feeding in Jerusalem district, Israel on 8486 women who delivered in three obstetric wards within a two year period. Women were interviewed on breast feeding of the previous child on the first or second day post partum by a research nurse. Results showed that failure to start breast feeding was best predicted ($p < 0.001$) by caesarean delivery, infant's birth weight, maternal smoking habits, and mother being non-immigrant. Long term breast feeding (three months or more) was strongly

affected (p < 0.001) by maternal education level, with both women with the fewest and the greatest number of years of schooling more likely to breast feed. The researchers concluded that Caesarean delivery and the infant's birth weight were strongly related to the decision to breast feed and efforts to encourage breast feeding ought to be targeted during the hospital stay and post partum period towards women identified as being at increased risk (Browning et al., 2007). A study assessed women's experience of post operative pain and pain relief after caesarean birth and birth experience in central Swedish county 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. 60 participants were included in the study. Results showed that high level of pain was experienced during first 24 hours of delivery and women were pleased with the pain relief. It also showed that post operative pain negatively affected breast feeding and infant care. The researchers recommended that early mobilization after caesarean birth is important for the mother child interaction (Karlstrom et al., 2007).The investigator through her experience has observed that the time of maternal ambulation after caesarean delivery varied in every hospital. Even though the advantages of early ambulation outweigh its limitations, it's not been practiced in many of the hospitals in India. No much research is done in this particular area. Addressing the specific needs of the post caesarean woman, facilitating early ambulation may help to overcome the challenges and barriers facing post caesarean women. This motivated the investigator to compare the impact of different ambulation time on maternal outcome in post caesarean mothers.

**Statement of the problem**

"A study to assess the impact of early and late ambulation on maternal outcome of mothers with caesarean birth in a selected hospital in Mangalore"

**Summary**

This chapter presented the background of the problem, need for the study and statement of the problem.

## 2. OBJECTIVES

"Success consists of going from failure to failure without loss of enthusiasm"

**WINSTON CHURCHILL**

Objectives are the specific achievements that the researcher hopes to accomplish by conducting the study. Specific achievable objectives provide clear criteria against which proposed research methods can be assessed.

**Statement of the problem**

"A study to assess the impact of early and late ambulation on maternal outcome of mothers with caesarean birth in a selected hospital in Mangalore"

**Objectives of the study**

- To determine the impact of early ambulation on maternal outcome of mothers with caesarean birth (group I).
- To determine the impact of late ambulation on maternal outcome of mothers with caesarean birth (group II).
- To compare the maternal outcome among group I and group II.
- To determine the association between maternal outcome on the second postnatal day and selected variables in group I and group II.

**Operational Definitions**

**Impact**

In this study it refers to the extent to which early and late maternal ambulation after caesarean birth helps in improving maternal outcome.

**Maternal outcome**

In this study, it refers to incidence of deep vein thrombosis, volume of lochia, involution of the uterus and infant caring behaviour.

**Deep vein thrombosis**

In this study, it refers to the thrombosis of the leg veins of the mother within 7 days of delivery as assessed by Homan's sign in the observation checklist. (Homan's sign is exhibited by the presence of calf muscle pain during the dorsiflexion of the foot).[1,2]

**Lochia**

It refers to the uterine flow after the delivery, consisting of blood, fragments of decidua, white blood cells and mucus.[1,2]

In this study, it refers to the volume of the uterine flow from the day of delivery to the third day of delivery as measured by weighing of the pads (1mililitre = 1gram)[2].

## Involution of the uterus

It refers to the reduction in size of the uterus after birth as it returns to its pre-pregnancy size and condition.[1]
In this study it refers to the absence of boggy and soft uterus.

## Infant caring behaviour

In this study it refers to frequency and duration of breast feeding, rooming in and maternal feelings of wellbeing as measured by a questionnaire.

## Mothers

In this study it refers to women in the age group of 20-45 years who have undergone caesarean section and has no major illness or complications of pregnancy and childbirth.

## Early ambulation

In this study it refers to giving the mothers upright position and making them walk between 10-24 hours of delivery for mothers who were given general anaesthesia and Spinal anaesthesia. The mothers are made to sit on the bed after 10 hours of delivery for 5 minutes. They are checked for headache, uneasiness and nausea. Those who do not exhibit the above symptoms are made to stand with support for 2-3 minutes and then ambulated in the ward with support for 15 minutes for every two hours. Mothers with headache, nausea and uneasiness will be given complete rest until 24 hours of delivery.

## Late ambulation

In this study it refers to ambulate the mothers after 24 hours of caesarean delivery.

## Assumptions

- Early ambulation may help in minimizing maternal complications after childbirth.
- Early ambulation can have a positive effect on the maternal outcome of mothers with caesarean delivery.
- There will be individual differences in maternal outcome of mothers in both the groups.

## Hypotheses

$H_1$: There will be a significant relationship between early ambulation and maternal outcome in group I.
$H_2$: There will be a significant relationship between late ambulation and maternal outcome in group II
$H_3$: There will be a significant difference between mean scores of maternal outcome of group I and group II.
$H_4$: There will be a significant association between maternal outcome on the second postnatal day and selected variables like in group I and group II.

## Conceptual framework

Concepts are the building blocks of theories, which classify the phenomenon of interest. The development of theoretical concepts permits the description and classification of phenomenon. Theoretical linkages offer an explanation of why the variables in the theory may be connected in some manner. Conceptual framework represents a less formal attempt at organising a phenomenon than theories. Both conceptual framework and theories use concepts as the building blocks. A visual or a symbolic representation of a theory or a conceptual framework often helps to express abstract ideas in a more readily understandable or graphic form than the original conceptualisation. Concepts and the linkages between them are represented diagrammatically through the use of boxes, arrows, or other symbols (Basavanthappa, 2003). Classic nursing process deals with the problems specific to nurses and their clients/patients. The nursing process also can provide a means for evaluating the quality of nursing care given and thus be used in demonstrating nurses' accountability and responsibility towards the client.

## The components/phases can be explained as follows.

- **Assessment:** It is a systematic and orderly collection and analysis of data about the past and the present health status of the client/patient for the purpose of making nursing diagnosis. A holistic view during assessment phase ensures that the total client is considered. In the present study assessment refers to the demographic variables like age, parity, educational qualifications, occupation, income, religion, type of operation, type of anaesthesia and time of initiation of breast feeding. of the mothers with caesarean birth.
- **Planning:** The planning phase of the nursing process which can be described as the determination of what can be done to assist the client and reflects the nursing actions. Planning involves the development of strategies to attain the expected outcome: to reduce the actual and potential problems. In the present study the researcher plans to provide early ambulation to

mothers with caesarean birth in group I that is to ambulate the mothers after 10 hours of surgery for 15 minutes every 2 hours and late ambulation to mothers with caesarean birth in group II that is to ambulate the mothers after 24 hours of caesarean delivery.

- **Implementation:** This is the next phase in the nursing process that occurs when nurse implemented the actions identified in the previous planning phase. In short implementation refers to putting a plan into action. In the present study the implementation phase involves those actions which the researcher selects to administer that is early ambulation to group I and late ambulation to group II. Mothers in both the groups will be checked for headache, uneasiness and nausea. Group I mothers will be allowed to sit in the bed for 5 minutes after 10 hours of surgery and then ambulated for 15 minutes every 2 hours. Mothers in group II will be allowed to get out of the bed after 24 hours. The maternal outcome of both the groups will be checked using a questionnaire and observation checklist at the 24th hour, 48th hour and 72nd hour of surgery.
- **Evaluation:** Evaluation is the final phase in the nursing process in which the client's progress towards attainment of outcomes is evaluated. Evaluation may be defined as the appraisal of the client's behavioural change that are a result of the actions of the nurse.

In the present study the evaluation involves the results of the intervention that is the maternal outcome which includes adequacy of breast feeding, successful rooming in, positive maternal feelings of wellbeing, absence of deep vein thrombosis, normal involution of the uterus and amount of lochia in both the groups.
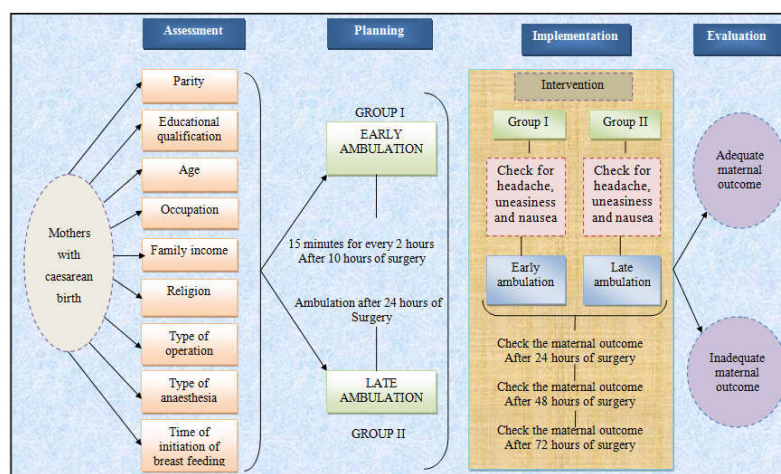


**Conceptual frame work based on classic nursing process model on the impact of early and late ambulation on maternal outcome of mothers with caesarean birth**

**Scope of the study**

- The result of 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 independent of medical practice.
- It can place emphasis on childbirth to a normal holistic experience.
- This can provide significant contribution to lower risk to clients and thus improve the outcome.
- This can stimulate further research in the field.

**Summary**

This chapter dealt with the statement of the problem, objectives, operational definitions, assumptions, hypothesis, conceptual framework, and scope of the study. The following chapter deals with the review of related literature.

# METHODOLOGY

"Imagination is more important than knowledge. For while knowledge defines all we currently know and understand, imagination points to all we might yet discover and create."

Albert Einstein

This chapter deals with the methodology of the present study, which includes research approach, research design, variables under study, setting of the study, population and sample, sampling technique, criteria for sample selection, description of the tool, pilot study, data collection process and plan for data analysis. Research methodology deals with decisions about the methods to be used to address the research questions and careful planning for the actual collection and analysis of data. Thus, research methodology is the systematic way of doing a research to solve a problem.

**Research approach**

Evaluative research is an applied form of research that involves finding out how well a programme, practice, or a policy is working. Its goal is to assess or evaluate the success of a programme (Abdellah, 1986). In order to test the main objective of the present study, i.e., to determine the impact of early and late ambulation on maternal outcome of mothers with caesarean birth, the researcher decided to adopt an evaluative research approach.

**The research approach used for the study is depicted in the figure below:**
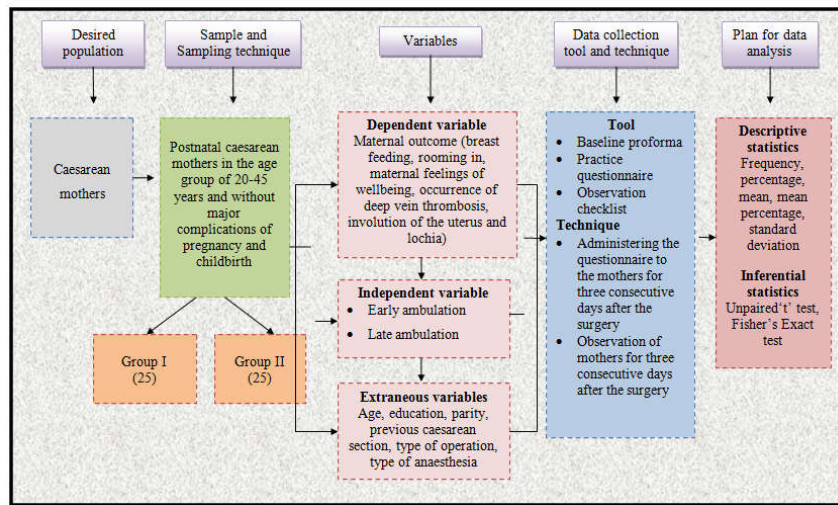


**Schematic representation of the research design**

**Research design**

The research design is the plan, structure and strategy of investigation, of answering the research question, is the overall plan or blueprint the researcher selects to carry out their study (Basavanthappa, 2003).

In this study, a quasi experimental (time series) research design was adopted. A schematic representation of the study design is shown below:

| Group | Treatment | Post test I | Post test II | Post test III |
|---|---|---|---|---|
| Group I | X, I | $O_1$ | $O_2$ | $O_3$ |
| Group II | I | $O_1$ | $O_2$ | $O_3$ |

Key:         X:         Ambulation after 10 hours of caesarean section

I:     Instructions given during the postnatal period to the caesarean mother.
$O_1$: Assessment of maternal outcome after caesarean section on second postnatal day using a practice questionnaire and an observation checklist.
$O_2$:     Assessment of maternal outcome after caesarean section on third postnatal day using a practice questionnaire and an observation checklist.
$O_3$:     Assessment of maternal outcome after caesarean section on fourth postnatal day using a practice questionnaire and an observation checklist.

**Variables under study**

Variable is defined as an attribute of a person or object that varies, that takes on different values.[17]

**Independent variable:** The variable that is believed to cause or influence the dependent variable.[16] The independent variable in this study is ambulation.

**Dependent variable:** The outcome variable that the researcher is interested in understanding, explaining, or predicting.[16] The presumed effect is the dependent variable. In this study, the maternal outcome (breast feeding, rooming in, maternal feelings of wellbeing, occurrence of deep vein thrombosis, involution of the uterus and lochia) is the dependent variable.

**Extraneous variable:** An uncontrolled variable that greatly influences the result of the study.[16] In this study, extraneous variables are the age of the mother, education, parity, previous caesarean section, type of operation and type of anaesthesia

**Setting of the study**

The study was conducted in Father Muller Medical College Hospital, Mangalore. The hospital is a 1050 bedded general hospital. It has a well equipped maternity ward with 70 beds and a well-equipped labour room. On an average 60 caesarean section deliveries take place per month.

**Population**

Population is the total number of people who meet the criteria that the researcher has established for the study from whom subjects will be selected and to whom the findings will be generalised.[17]
 The population in this study included mothers who had undergone caesarean section and who were available at the time of data collection.

**Sample and sampling technique**

Sample is the subset of the units that comprise the population (Polit, 1999). Sampling is a process of selecting a subset of the population to obtain data regarding a problem (Polit, 1999). Purposive sampling technique was used because of the limited availability of time and subjects. It is based on the medical and obstetrical condition of the subjects that the investigator selects or handpicks the elements of the study. The elements chosen are thought to best represent the phenomenon or topic being studied. The sample in the study consisted of fifty mothers who met the inclusion criteria. The selected subjects were randomly assigned to group I and group II (n = 25 in each group).

**Group I**

Twenty five mothers who had undergone caesarean section and who are ambulated after 10 hours of surgery.

**Group II**

Twenty five mothers who had undergone caesarean section and who are ambulated after 24 hours of surgery.
Criteria laid down for the selection of samples were:

**Inclusion criteria**

- Mothers who are willing to participate in the study.
- Mothers in the age group of 20-45 years.
- Mothers who are able to read and write Kannada and English

**Exclusion criteria**

- Mothers who develop headache, uneasiness and nausea within 24 hours of surgery.
- Mothers previously diagnosed to have major illness.
- Mothers with major complications of pregnancy and child birth.

**Data collection instruments**

Tools are the procedures or instruments used by the researcher to collect the data. The tool used to collect the data consisted of:

**Tool I:** Baseline proforma.

**Tool II:** Practice questionnaire to assess the adequacy of breast feeding, rooming in and maternal feelings of wellbeing.

**Tool III:** Observation checklist to assess the occurrence of deep vein thrombosis, involution of the uterus and amount of lochia

**Development of the tool**

**The following steps were adopted in the development of the tool:**

- Review of literature.
- Discussion with experts.
- Development of blueprint.
- Construction of tool.
- Content validity.
- Reliability.

**Preparation of blueprint:** A blueprint was developed prior to the construction of the practice questionnaire which depicted the distribution of items into three main content areas: breast feeding (25) rooming in (43.75) and maternal feelings of wellbeing

(31.25). The observation checklist depicted the distribution of items into three main content areas: deep vein thrombosis (33.33), involution of the uterus (33.33) and lochia (33.34)

**Construction of tool:** The tool was developed based on the review of literature and discussion with experts. It comprised of three parts – baseline proforma with 13 items, practice questionnaire with 16 questions and observation checklist with 3 items.

1.**Content validity:** Content validity refers to the extent to which an instrument measures what it is supposed to measure (Polit, 1999). The tool along with the blueprint and criteria checklists (Annexure 6, 7 and 8) was submitted to 12 experts (Annexure 11) to establish the content validity. The experts were eleven obstetrics and gynaecology nursing experts and one obstetrics and gynaecology specialist. They were requested to verify the items for their relevance, accuracy, and appropriateness. There was 100% agreement on almost all items, but suggestions were given to modify a few items. The modifications were made in the tool. The draft tool consisted of 12 items in the baseline proforma, 19 items in the practice questionnaire and 4 items in the observation checklist. Based on the suggestions given by the validators, necessary modifications were made. The final tool consisted of 13 items in the baseline proforma, 16 items in the practice questionnaire and 3 items in the observation checklist.

**Establishing reliability of the tool:** Reliability is the degree of consistency that the instrument or procedure demonstrates (Polit, 1999). Reliability of the tool was carried out among 10 subjects admitted in Father Muller Medical College hospital. Split half technique was used to estimate the reliability of the practice questionnaire. Spearman brown prophecy formula was used to determine the reliability. The value obtained was 0.9. Hence the tool is considered to be reliable. Inter-rater observation technique was adopted to estimate the reliability of the observation checklist. Maternal outcome was observed and recorded at the same time by the investigator and her colleague. The reliability of the observation checklist was found by Spearman rank correlation and cronbach's coefficient alpha and was found to be 0.9, which indicated that the tool was reliable.

## Description of the final tool

The final tool consisted of the following three parts:

Tool I:   Baseline proforma.

Tool II:  Practice questionnaire to assess the adequacy of breast feeding, rooming in and maternal feelings of wellbeing.

Tool III:  Observation checklist to assess the occurrence of deep vein thrombosis, involution of the uterus and amount of lochia

The items in the practice questionnaire were divided into breast feeding, rooming in and maternal feelings of wellbeing. Breast feeding section included four questions, rooming in section included seven question and maternal feelings of wellbeing included five questions. Scores were assigned as 1 and 0 for positive item and negative item respectively. The maximum possible score was 16 and minimum was 0 in the questionnaire.

The observation checklist was divided into deep vein thrombosis, involution of the uterus and lochia. All the three areas had one question each. Scores were assigned as 1 and 0 for absence of deep vein thrombosis and absence of soft and boggy uterus and presence of deep vein thrombosis and presence of soft and boggy uterus respectively.

## Pilot study

Pilot study is a small preliminary investigation of the same general character as a major study. The main aim was to assess the feasibility, practicability, and assessment of adequacy of measurement (Polit, 1999). The investigator conducted the pilot study in Father Muller Medical College Hospital, Mangalore from 24-09-09 to 5-10-09. The sample size for pilot study was 10 (5 in the group I and 5 in the group II).

The purpose of the study was explained to the subjects prior to the study, to obtain their cooperation, an informed consent was taken. After which the mothers underwent caesarean section and according to their condition they were given early/late ambulation. The first, second, third data was collected when the mothers were in H ward and after 24, 48, 72 hours of caesarean birth respectively using a practice questionnaire and an observation checklist. The study was found to be feasible and practicable. No modification was made in the tool after the pilot study. Data analysis was done using descriptive and inferential statistics (Annexure 12).

## Data collection process

A formal written permission was obtained from the Director of Father Muller Medical College Hospital, Mangalore (Annexure 2). Data was collected from 10-10-09 to 14-11-09. Prior to data collection, the investigator familiarised herself with the subjects and explained to them the purpose of the study. She requested the participant's full cooperation and assured them confidentiality of their response. An informed consent was obtained from the subjects (Annexure 9 and 10).The mothers in group I were made to sit on the bed after 10 hours of delivery for 5 minutes. They were checked for headache, uneasiness and nausea. Those who did not exhibit the above symptoms were made to stand with support for 2-3 minutes and then ambulated in the ward with support for 15 minutes for every two hours. Mothers with headache, nausea and uneasiness were given complete rest until 24 hours of delivery.

The mothers in group II were checked for headache, uneasiness and nausea. Mothers in this group were ambulated only after 24 hours of the surgery. The first, second and third data was collected when the mother was in H ward and after 24, 48, 72 hours of caesarean birth respectively using a practice questionnaire and an observation checklist. The investigator was motivated throughout the study by the cooperation of the subjects and their positive response. The subjects were very cooperative and showed much interest in the study. The investigator was satisfied and happy with the cooperation, interest, and appreciation from others. There was no sample mortality.

The data collected was compiled for data analysis.

**Plan for data analysis**

**Data was planned to be analysed on the basis of objectives and hypothesis.**

- Baseline proforma would be analysed in terms of frequency and percentage and presented in the form of tables, and figures.
- The maternal outcome scores of mothers with caesarean birth will be analysed in terms of mean, mean percentage, and standard deviation and will be presented in the form of tables.
- The significant difference in the maternal outcome scores between group I and group II would be determined by unpaired 't' test and difference between the proportions.
- The association between maternal outcome and selected variables will be analysed by a 2x2 contingency table Fisher's exact test.

**Problems faced during data collection**

- The data collection time varied for each sample.
- The investigator had to spend most of the time in the hospital.

**Summary**

In this chapter the research approach, setting of the study, variables, population, sample and sampling technique, sampling criteria, development and testing of the tool, pilot study, data collection process, and plan for data analysis are discussed. The next chapter deals with the result of the study.

# RESULTS

"Greatness is not in where we stand, but in what direction we are moving. We must sail sometimes with the wind and sometimes against it."

Oliver Wendell Holmes

This chapter deals with the analysis and results of data collected from fifty mothers who underwent caesarean section. The aim of the study was to determine the effectiveness of early and late ambulation on the maternal outcome of mothers who underwent caesarean section. Analysis of the data can be defined as the systematic organization and synthesis of research and testing of the research hypothesis using these data (Polit, 1999). The data obtained were analyzed and interpreted based on the objectives and hypothesis of the study.

**Objectives of the study**

- To determine the impact of early ambulation on maternal outcome of mothers with caesarean birth (group I).
- To determine the impact of late ambulation on maternal outcome of mothers with caesarean birth (group II).
- To compare the maternal outcome among group I and group II.
- To determine the association between maternal outcome on the second postnatal day and selected variables in group I and group II.

**The hypotheses of the study were:**

$H_1$: There will be a significant relationship between early ambulation and  maternal outcome in group I.
$H_2$: There will be a significant relationship between late ambulation and maternal outcome in group II.
$H_3$: There will be a significant difference between mean scores of maternal outcome of group I and group II.
$H_4$: There will be a significant association between maternal outcome on the second postnatal day and selected variables in group I and group II.

**Organization of findings**

The data is analyzed and presented under the following headings

Section 1:-          Description of the baseline proforma.
Section II: -        Maternal outcome of group I (early ambulation)
Section III: -       Maternal outcome of group II (late ambulation)
Section IV: -        Comparison of maternal outcome between group I and group II
Section V: -         Evaluation of the effectiveness of early ambulation in terms of significance in the difference in the maternal outcome of group I and group II on the second postnatal day.

Section VI: -    Evaluation of the effectiveness of early ambulation in terms of significance in the difference in the maternal outcome of group I and group II on the third postnatal day.

Section VII: -    Evaluation of the effectiveness of early ambulation in terms of significance in the difference in the maternal outcome of group I and group II on the fourth postnatal day.

Section VIII: -    Association between maternal outcome on the second postnatal day in group I and group II and selected demographic variables

## Section I: Description of baseline proforma

This section deals with the analysis of data related to the baseline proforma of the caesarean mothers who were in the group I and group II.

**Table 1: Frequency and percentage distribution of sample characteristics in group I and group II**

N=50

| Variable | | Group I (early ambulation) | | Group II (late ambulation) | |
|---|---|---|---|---|---|
| | | f | % | f | % |
| 2. | parity | | | | |
| a. | Primipara | 9 | 36 | 9 | 36 |
| b. | Multipara | 16 | 64 | 16 | 64 |
| 3. | Mode of previous deliveries in multipara mothers | | | | |
| a. | Only Caesarean section | 6 | 37.5 | 4 | 25 |
| b. | Only vaginal deliveries | 8 | 50 | 10 | 62.5 |
| c. | Both caesarean section | | | | |
| and vaginal delivery | | 2 | 12.5 | 2 | 12.5 |
| 4. | Educational status | | | | |
| a. | Illiterate | - | - | - | - |
| b. | Primary education | 10 | 40 | 14 | 56 |
| c. | Secondary education | 7 | 28 | 5 | 20 |
| d. | Higher secondary education | 7 | 28 | 3 | 12 |
| e. | Graduation and above | 1 | 4 | 3 | 12 |
| 5. | Family income/month | | | | |
| a. | Rs 2000 and below | - | - | - | - |
| b. | Rs 2001-4000 | 6 | 24 | - | - |
| c. | Rs 4001-6000 | 10 | 40 | 15 | 60 |
| d. | Rs 6001 and above | 9 | 36 | 10 | 40 |
| 6. | Occupation | | | | |
| a. | Housewife | 22 | 88 | 20 | 80 |
| b. | Labour/coolie | - | - | 1 | 4 |
| c. | Technical | 3 | 12 | 2 | 8 |
| d. | professional | - | - | 2 | 8 |
| 7. | Religion | | | | |
| a. | Hindu | 4 | 16 | 5 | 20 |
| b. | Christian | 4 | 16 | 3 | 12 |
| c. | Islam | 17 | 68 | 17 | 68 |
| d. | Others | - | - | - | - |
| 8. | Type of operation | | | | |
| a. | Emergency caesarean | 17 | 68 | 16 | 64 |
| b. | Elective caesarean | 8 | 32 | 9 | 36 |
| 9. | Type of anaesthesia | | | | |
| a. | General anaesthesia | - | - | - | - |
| b. | Spinal anaesthesia | 25 | 100 | 25 | 100 |
| 10. | Time of ambulation after surgery | | | | |
| a. | Between $10^{th}$-$11^{th}$ hour | | | | |
| b. | Between $12^{th}$-$13^{th}$ hour | - | - | - | - |
| c. | Between $14^{th}$-$15^{th}$ hour | - | - | - | - |
| d. | Between $16^{th}$-$17^{th}$ hour | 2 | 8 | - | - |
| e. | Between $18^{th}$-$19^{th}$ hour | 11 | 44 | - | - |
| f. | Between $20^{th}$-$21^{th}$ hour | 9 | 36 | - | - |
| g. | Between $22^{nd}$-$23^{rd}$ hour | 3 | 12 | - | - |
| h. | In the $24^{th}$ hour | - | - | - | - |
| i. | After 24 hours | - | - | - | - |
| | | - | - | 25 | 100 |
| 11. | Time of first contact with the baby after surgery | | | | |
| a. | Within 4 hours | | | | |
| b. | Between 5-14 hours | 25 | 100 | 25 | 100 |
| c. | Between to 15-24 hours | - | - | - | - |
| | | - | - | - | - |
| 12. | Time of initiation of breast feeding | | | | |
| a. | Within 1 hour | | | | |
| b. | between 2-6 hours | - | - | - | - |
| c. | between 7-12 hours | 18 | 72 | 8 | 32 |
| d. | between 13-18 hours | 7 | 28 | 9 | 36 |
| e. | between 19-24 hours | - | - | 8 | 32 |
| f. | After 24 hours | - | - | - | - |
| | | - | - | - | - |

**Age**
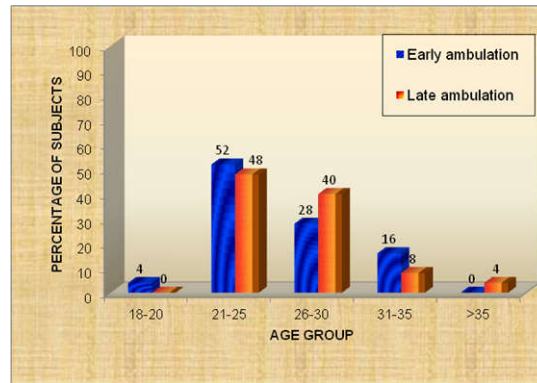


**Figure 1. 3D Bar diagram showing distribution of samples according to age**

From Table 1 and Figure 1 it is evident that 52% and 48% of the sample in group I and group II respectively fell into the age group of 21-25 years; 28% and 40% were aged between 26 and 30 years; 16% and 8% belonged to 31-35 years in the experimental and control groups respectively

**Parity**

36 % of the mothers in group I and group II were primigravida and 64% of the mothers in group I and group II were multipara.

**Mode of previous deliveries in multipara mothers**

50% of the mothers in group I had previous vaginal deliveries and 62.5% of the mothers in group II had previous vaginal deliveries.
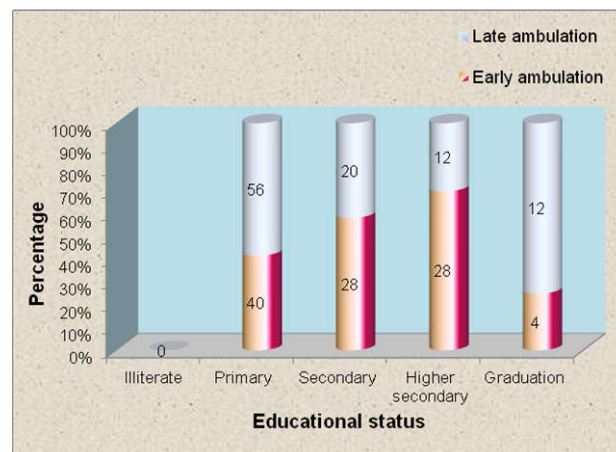


**Figure 2: Cylinder diagram showing distribution of samples according to their educational status**

**Educational status**

Data in the Table 1 and Figure 2 shows that 40% of the samples of group I and 56% of the samples in group II had primary education; 28% of the samples in group I and 20 % of the samples in group II had secondary education. There were few samples that had higher secondary and graduate education. None of the samples were illiterate.

**Family income/month**

40% of the mothers in group I have their monthly income Rs 6000 and more and 60% of the mothers in group II have their income between Rs 4001 and Rs 6000.

**Occupation**

88% of the mothers in group I and  80% of mothers in group II were housewives.

**Religion**

Data in the Table 1 and Figure 3 shows that 16% of the samples of experimental group and 20% of the control group belonged to the Hindu religion; 16% and 12% of the samples in the experimental group and the control groups respectively were Christians and 68% of the samples in both the groups were Muslims.

**Figure 3. Pyramid diagram showing distribution
of samples according to their religion**

**Type of anesthesia**

100% mothers in both group I and group II were given spinal anesthesia.

**Time of ambulation**

44% of the mothers in group I had ambulated in the 16th- 17th hour of the surgery and 100% of the mothers in group II ambulated after 24 hours of the surgery.
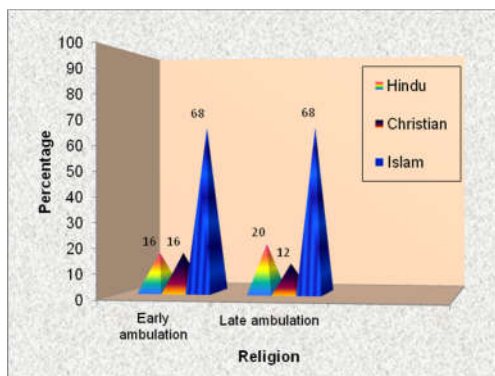
**Type of operation**
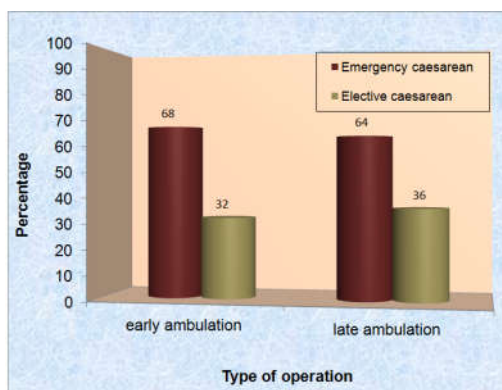


**Figure 4. Cylinder diagram showing distribution of samples
according to the type of operation**

Data in the Table 1 and Figure 4 shows that 68% of the samples of group I and 64% of the group II had undergone emergency caesarean section and 32% of the samples in group I and 36% of the samples in group II had undergone elective caesarean section.

**Time of first contact with the baby after surgery**

100% of the mothers in both the groups had first contact with their baby within 4 hours of the surgery.

**Time of initiation of breast feeding**

72% of the mothers in group I had initiated breast feeding between 2-6 hours of the surgery and 36% of the mothers in group II had initiated breast feeding between 6-12 hours of the surgery.

**Section II**: **Maternal outcome of group I (early ambulation)**

**Table 2: Mean and Standard deviation of Breast feeding, rooming in and maternal
feelings of wellbeing scores in group I (early ambulation)**

N=25

| AREA | Day 2 | | Day 3 | | Day 4 | |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD |
| Breast feeding | 3.64 | 0.57 | 3.96 | 0.2 | 4 | 0 |
| Rooming in | 5.88 | 0.9 | 6.8 | 0.41 | 7 | 0 |
| Maternal feelings of wellbeing | 4.6 | 0.5 | 4.8 | 0.4 | 5 | 0 |
| Total | 14 | 1.38 | 15.6 | 0.5 | 16 | 0 |

Data in table 2 shows that the mean of breast feeding, rooming in and maternal feelings of wellbeing scores on postnatal day 2 is less when compared to the mean of breast feeding, rooming in and maternal feelings of wellbeing scores on postnatal day 3 and postnatal day 4.

**Table 3: Mean and standard deviation of post tests scores of lochia in group I (early ambulation)**

| | | | | | N=25 | |
|---|---|---|---|---|---|---|
| AREA | Day 2 | | Day 3 | | Day 4 | |
| | Mean | SD | Mean | SD | Mean | SD |
| Lochia- weight of the perineal pads in grams | 268 | 8.2 | 165 | 8.4 | 57 | 5.7 |

Data in table 3 shows that the mean weight of perineal pads in early ambulation is high on postnatal day 2 (268 gm) and lowest on postnatal day 4(57 gm).

**Table 4: Occurrence of deep vein thrombosis and involution of the uterus in group I (early ambulation)**

| | | | | N=25 |
|---|---|---|---|---|
| Postnatal day | DVT (Homan's sign) | | Involution of the uterus (boggy and soft uterus) | |
| | Present | Absent | Present | Absent |
| Day 2 | 0 | 25 | 0 | 25 |
| Day 3 | 0 | 25 | 0 | 25 |
| Day 4 | 0 | 25 | 0 | 25 |

Data in table 4 shows that the risk of occurrence of deep vein thrombosis and presence of soft and boggy uterus in group I on all the three days is nil.

**Section III: Maternal outcome of group II (late ambulation)**

**Table 5: Mean and standard deviation of Breast feeding, rooming in and maternal feelings of wellbeing scores in group II (late ambulation)**

| | | | | | N=25 | |
|---|---|---|---|---|---|---|
| AREA | Day 2 | | Day 3 | | Day 4 | |
| | Mean | SD | Mean | SD | Mean | SD |
| Breast feeding | 2.4 | 1 | 3.9 | 0.3 | 4 | 0 |
| Rooming in | 4.4 | 0.91 | 5.96 | 0.98 | 7 | 0 |
| Maternal feelings of wellbeing | 1.76 | 1.39 | 4.44 | 0.71 | 4.84 | 0.37 |
| Total | 8.44 | 2.71 | 14.28 | 1.4 | 15.84 | 0.37 |

Data in table 5 shows that the mean of breast feeding, rooming in and maternal feelings of wellbeing on postnatal day 2 in group II is less when compared to the mean of breast feeding, rooming in and maternal feelings of wellbeing scores on postnatal day 3 and postnatal day 4.

**Table 6: Mean and standard deviation of scores of lochia in group II (late ambulation)**

| | | | | | N=25 | |
|---|---|---|---|---|---|---|
| AREA | Day 2 | | Day 3 | | Day 4 | |
| | Mean | SD | Mean | SD | Mean | SD |
| Lochia- weight of the perineal pads in grams | 248 | 11 | 138 | 6.5 | 70 | 11 |

Data in table 6 shows that the mean weight of perineal pads in early ambulation is high on postnatal day 2 (248 gm) and lowest on postnatal day 4 (70 gm).

**Table 7: Occurrence of deep vein thrombosis and involution of the uterus in group II (late ambulation)**

| | | | | N=25 |
|---|---|---|---|---|
| Postnatal day | DVT (Homan's sign) | | Involution of the uterus (boggy and soft uterus) | |
| | Present | Absent | Present | Absent |
| Day 2 | 0 | 25 | 0 | 25 |
| Day 3 | 0 | 25 | 0 | 25 |
| Day 4 | 0 | 25 | 0 | 25 |

Data in table 7 shows that the risk of occurrence of deep vein thrombosis and presence of soft and boggy uterus in group I is nil on all the three postnatal days.

## Section IV: Comparison of maternal outcome between group I (early ambulation) and group II (late ambulation)

**Table 8: Grading of infant caring behaviour scores in group I
(early ambulation) and group II (late ambulation)**

| Infant caring behaviour | | Group I | | Group II | |
|---|---|---|---|---|---|
| | | Adequate | Inadequate | Adequate | Inadequate |
| Range | | 13-16 | 0-12 | 13-16 | 0-12 |
| Day 2 | f | 22 | 3 | 4 | 21 |
| | % | 88 | 12 | 16 | 84 |
| Day 3 | f | 25 | 0 | 21 | 4 |
| | % | 100 | 0 | 84 | 16 |
| Day 4 | f | 25 | 0 | 25 | 0 |
| | % | 100 | 0 | 100 | 0 |

N=25+25

Maximum score=16

Data in table 8 indicate that 88%, 100% and 100% of the subjects have adequate infant caring behaviour on day 2, day 3 and day 4 respectively in group I. It also shows that 16%, 84%, 100% of the subjects have adequate infant caring behaviour on day 2, day 3 and day respectively in group II.

**Table 9: Range, Mean, Median and Standard Deviation of infant caring
behaviour scores in group I (early ambulation)**

N=25

| Infant caring behaviour | Range | Mean | Median | SD |
|---|---|---|---|---|
| Day 2 | 11-16 | 14 | 14 | 1.38 |
| Day 3 | 15-16 | 15.6 | 16 | 0.5 |
| Day 4 | 16 | 16 | 16 | 0 |

Data in table 9 shows that the mean infant caring behaviour scores on second, third and fourth postnatal day in group I was 14, 15.6 and 16 respectively.

**Table 10: Range, Mean, Median and Standard Deviation of infant caring
behaviour scores in group II (late ambulation)**

N=25

| Infant caring behaviour | Range | Mean | Median | SD |
|---|---|---|---|---|
| Day 2 | 4-13 | 8.44 | 8 | 2.71 |
| Day 3 | 12-16 | 14.28 | 15 | 1.4 |
| Day 4 | 15-16 | 15.84 | 16 | 0.37 |

Data in table 10 shows that the mean infant caring behaviour scores on second, third and fourth postnatal day in group I was 8.44, 14.28 and 16 respectively.

**Table 11: Range, mean, median and standard deviation of scores of
lochia in group I (early ambulation)**

N=25

| AREA | weight of the perineal pads | | |
|---|---|---|---|
| | Range | Mean | SD |
| Day 2 | 256-288 | 268 | 8.2 |
| Day 3 | 152-184 | 165 | 8.4 |
| Day 4 | 48-69 | 57 | 5.7 |

Data in table 11 shows that the mean weight of perineal pads on second, third and fourth postnatal day in group I was 268 grams, 165 grams and 57 grams respectively.

**Table 12: Range, mean and standard deviation of scores of
lochia in group II (late ambulation)**

N=25

| AREA | weight of the perineal pads in grams | | |
|---|---|---|---|
| | Range | Mean | SD |
| Day 2 | 229-272 | 248 | 11 |
| Day 3 | 124-146 | 138 | 6.5 |
| Day 4 | 49-88 | 70 | 11 |

Data in table 12 shows that the mean weight of perineal pads on second, third and fourth postnatal day in group II was 248 grams, 138 grams and 70 grams respectively.

**Table 13: Occurrence of deep vein thrombosis and involution of the uterus in group I (early ambulation) and group II (late ambulation)**

N=25+25

| Postnatal day | DVT (Homan's sign) | | Involution of the uterus (boggy and soft uterus) | |
|---|---|---|---|---|
| | Group I | Group II | Group I | Group II |
| Day 2 | 0 | 0 | 0 | 0 |
| Day 3 | 0 | 0 | 0 | 0 |
| Day 4 | 0 | 0 | 0 | 0 |

Data in table 13 shows that none of the mothers in group I and group II had the risk of occurrence of deep vein thrombosis and had normal involution of the uterus on all the three postnatal days.

**Table 14: Area wise Distribution of Mean, Mean percentage and Standard deviation of infant caring behaviour scores (postnatal day 2) in group I (early ambulation) and group II (late ambulation)**

**N=25+25**

| Area | Group I | | | | | | Group II | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Maximum possible | Mean | SD | Mean % | Maximum | minimum | Maximum possible | Mean | SD | Mean % |
| Breast feeding | 4 | 2 | 4 | 3.64 | 0.57 | 91 | 4 | 1 | 4 | 2.4 | 1 | 60 |
| Rooming in | 7 | 4 | 7 | 5.88 | 0.97 | 84 | 7 | 3 | 7 | 4.4 | 0.9 | 62.9 |
| Maternal feelings of wellbeing | 5 | 4 | 5 | 4.6 | 0.5 | 92 | 5 | 1 | 5 | 1.76 | 1.39 | 35.2 |

Data in table 14 shows that mean percentage of breast feeding score is highest (91%) and rooming in scores is lowest (84%) in group I and mean percentage of breast feeding score is highest (60%)and maternal feelings of wellbeing scores is lowest (35.2%) in group II

**Table 15: Area wise Distribution of Mean, Mean percentage and Standard deviation of infant caring behaviour scores (postnatal day 3) in group I (early ambulation) and group II (late ambulation)**

N=25+25

| Area | Group I | | | | | | Group II | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Maximum possible | Mean | SD | Mean % | Maximum | minimum | Maximum possible | Mean | SD | Mean % |
| Breast feeding | 4 | 3 | 4 | 3.96 | 0.2 | 99 | 4 | 3 | 4 | 3.9 | 0.3 | 98 |
| Rooming in | 7 | 6 | 7 | 6.8 | 0.4 | 97 | 7 | 4 | 7 | 5.96 | 0.98 | 85.1 |
| Maternal feelings of wellbeing | 5 | 4 | 5 | 4.8 | 0.4 | 96 | 5 | 3 | 5 | 4.44 | 0.71 | 88.8 |

Data in table 15 shows that mean percentage of breast feeding and maternal feelings of wellbeing scores are highest (99%) and maternal feelings of wellbeing scores is lowest (96%) in group I and mean percentage of breast feeding score is highest (98%) and rooming in score is lowest (85.1%) in group II.

**Table 16: Area wise Distribution of Mean, Mean percentage and Standard deviation of infant caring behaviour scores (postnatal day 4) in group I (early ambulation) and group II (late ambulation)**

N=25+25

| Area | Group I | | | | | | Group II | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Maximum possible | Mean | SD | Mean % | Maximum | minimum | Maximum possible | Mean | SD | Mean % |
| Breast feeding | 4 | - | 4 | 4 | 0 | 100 | 4 | - | 4 | 4 | 0 | 100 |
| Rooming in | 7 | - | 7 | 7 | 0 | 100 | 7 | - | 7 | 7 | 0 | 100 |
| Maternal feelings of wellbeing | 5 | - | 5 | 5 | 0 | 100 | 5 | 4 | 5 | 4.84 | 0.37 | 99 |

Data in table 16 shows that mean percentage of breast feeding score, rooming in and maternal feelings of wellbeing are all the maximum (100%) in group I and mean percentage of breast feeding and rooming in score are highest (100%) and maternal feelings of wellbeing scores is lowest (99%) in group II.

**Section V: Evaluation of the effectiveness of early ambulation in terms of significance in the difference in the maternal outcome of group I (early ambulation) and group II (late ambulation) on the second postnatal day**

$H_{01:}$      There will be no significant difference in the Maternal outcome scores of mothers with caesarean delivery on the second postnatal day in group I (early ambulation) and group II (late ambulation)

**Table 17: Mean, Mean difference, standard deviation and 't' value (unpaired) of the maternal outcome scores of mothers with caesarean delivery on the second postnatal day in group I (early ambulation) and group II (late ambulation)**

N=25+25

| Area | Mean | | SD | | Mean difference | Unpaired 't' value |
|---|---|---|---|---|---|---|
| | I | II | I | II | | |
| Breast feeding | 3.6 | 2.4 | 0.57 | 1 | 1.2 | 7.75* |
| Rooming in | 5.88 | 4.4 | 0.97 | 0.91 | 1.48 | 5.25* |
| Maternal feelings of wellbeing | 4.6 | 1.76 | 0.5 | 1.39 | 2.84 | 12.91* |
| Weight of the perineal pads in grams | 268 | 248 | 8.2 | 11 | 20 | 10.20* |

t(48)=2.011 * significant

The computed value shows that there is a significant difference in breast feeding, rooming in, maternal feelings of wellbeing and lochia scores of mothers with caesarean delivery on the second postnatal day in group I and group II at 0.05 level of significance and hence the null hypothesis is rejected and research hypothesis is accepted.

$H_{02:}$　　　There is no significant difference in the risk of occurrence of deep vein thrombosis and in the involution of the uterus in mothers with caesarean delivery on the second postnatal day in group I (early ambulation) and group II (late ambulation)

**Table 18: 'Z' value of the risk of deep vein thrombosis and involution of the uterus scores of mothers with caesarean delivery on the second postnatal day in group I (early ambulation) and group II (late ambulation)**

N=25+25

| Area | Group | | Z value |
|---|---|---|---|
| | I | II | |
| DVT (Homan's sign) | 25/25 | 25/25 | 0 |
| Involution of the uterus (soft and boggy uterus) | 25/25 | 25/25 | 0 |

R: |Z| > 1.96

The observed value is 0 which falls under the acceptance region of the normal curve and hence null hypothesis is accepted and thus it can be concluded that there is no difference in the risk of occurrence of deep vein thrombosis and in the involution of the uterus in mothers with caesarean delivery on the second postnatal day in group I and group II.

**Section VI: Evaluation of the effectiveness of early ambulation in terms of significance in the difference in the maternal outcome of group I (early ambulation) and group II (late ambulation) on the third postnatal day.**

$H_{03:}$　　　There will be no significant difference in the maternal outcome scores of mothers with caesarean delivery on the third postnatal day in group I(early ambulation) and group II (late ambulation).

**Table 19: Mean, Mean difference, standard deviation and 't' value of the maternal outcome scores of mothers with caesarean delivery on the third postnatal day in group I (early ambulation) and group II (late ambulation)**

N=25+25

| Area | Mean | | SD | | Mean difference | Unpaired 't' value |
|---|---|---|---|---|---|---|
| | I | II | I | II | | |
| Breast feeding | 3.96 | 3.9 | 0.2 | 0.3 | 0.06 | 3.75* |
| Rooming in | 6.8 | 5.96 | 0.41 | 0.98 | 0.84 | 7.4* |
| Maternal feelings of wellbeing | 4.8 | 4.44 | 0.4 | 0.71 | 0.36 | 3* |
| Weight of the perineal pads in grams | 165 | 138 | 8.2 | 6.5 | 27 | 18.12* |

t(48)=2.011  * significant

The computed value shows that there is a significant difference in breast feeding, rooming in, maternal feelings of wellbeing and lochia scores of mothers with caesarean delivery on the third postnatal day in group I and group II at 0.05 level of significance. The null hypothesis is rejected and research hypothesis is accepted.

$H_{04:}$　　　There is no significant difference in the risk of occurrence of deep vein thrombosis and in the involution of the uterus in mothers with caesarean delivery on the third postnatal day in group I (early ambulation) and group II (late ambulation)

**Table 20: 'Z' value of the risk of deep vein thrombosis and involution of the uterus in mothers with caesarean delivery on the third postnatal day in group I (early ambulation) and group II (late ambulation)**

N=25+25

| Area | Group | | Z value |
|---|---|---|---|
| | I | II | |
| DVT (Homan's sign) | 25/25 | 25/25 | 0 |
| Involution of the uterus (soft and boggy uterus) | 25/25 | 25/25 | 0 |

R: |Z| > 1.96

The observed value is 0 which falls under the acceptance region of the normal curve and hence null hypothesis is accepted and thus it can be concluded that there is no difference in the risk of occurrence of deep vein thrombosis and in the involution of the uterus in mothers in mothers with caesarean delivery on the third postnatal day in group I and group II.

**Section VII: Evaluation of the effectiveness of early ambulation in terms of significance in the difference in the maternal outcome of group I (early ambulation) and group II (late ambulation) on the fourth postnatal day**

$H_{05:}$      There will be no significant difference in the maternal outcome scores of mothers with caesarean delivery on the fourth postnatal day in group I (early ambulation and group II (late ambulation)

**Table 21: Mean, Mean difference, standard deviation and 't' value of the maternal outcome scores of mothers with caesarean delivery on the fourth postnatal day in group I (early ambulation) and group II (late ambulation)**

N=25+25

| Area | Mean | | SD | | Mean difference | Unpaired 't' value |
|---|---|---|---|---|---|---|
| | I | II | I | II | | |
| Breast feeding | 4 | 4 | 0 | 0 | 0 | 0 |
| Rooming in | 7 | 7 | 0 | 0 | 0 | 0 |
| Maternal feelings of wellbeing | 5 | 4.84 | 0 | 0.37 | 0.16 | 3.02* |
| Weight of the perineal pads in grams | 57 | 70 | 5.7 | 3.2 | 11 | 7.35* |

t(48)=2.011   * significant

The computed value shows that there is no significant difference in the breast feeding, rooming in scores of mothers with caesarean delivery on the fourth postnatal day in group I and group II at 0.05 level of significance. The null hypothesis is accepted and research hypothesis is rejected. The computed value for maternal feelings of wellbeing and lochia shows that there is a significant difference in the scores between group I and group II. Hence null hypothesis is rejected and research hypothesis is accepted.

$H_{06:}$      There is no significant difference in the risk of occurrence of deep vein thrombosis and in the involution of the uterus in mothers with caesarean delivery on the fourth postnatal day in group I (early ambulation) and group II

**Table 22: 'Z' value of the risk of deep vein thrombosis and involution of the uterus scores of mothers with caesarean delivery on the fourth postnatal day in group I (early ambulation) and group II (late ambulation)**

N=25+25

| Area | Group | | Z value |
|---|---|---|---|
| | I | II | |
| DVT (Homan's sign) | 25/25 | 25/25 | 0 |
| Involution of the uterus (soft and boggy uterus) | 25/25 | 25/25 | 0 |

R: |Z| > 1.96

The observed value is 0 which falls under the acceptance region of the normal curve and hence null hypothesis is accepted and thus it can be concluded that there is no difference in the risk of occurrence of deep vein thrombosis and in the involution of the uterus in mothers with caesarean delivery on the fourth postnatal day in group I and group II

**Section VIII: Association between maternal outcome on the second postnatal day in group I (early ambulation) and group II (late ambulation) and selected demographic variables**

**Table 23: Fisher's exact test for association between infant caring behavior scores of the second postnatal day and selected variables**

N=25+25

| Variable | Group I (early ambulation) | | | Group II (late ambulation) | | |
|---|---|---|---|---|---|---|
| | ≤ median | > median | p | ≤ median | > median | p |
| 1.Parity | | | | | | |
| a.Primipara | 6 | 3 | 2.04* | 6 | 3 | 0.051* |
| b.Multipara | 11 | 5 | | 10 | 6 | |
| 2.  Education | 14 | 3 | 0.21* | 13 | 6 | 0.12* |
| a.10th and below | 3 | 5 | | 2 | 4 | |
| b.11th and above | | | | | | |
| 3.  Income | | | | | | |
| a.6000 and below | 12 | 4 | 2.12* | 11 | 4 | 0.08* |
| b.Above 6000 | 5 | 4 | | 4 | 6 | |
| 4.  Type of operation | | | | | | |
| a.Emergency caesarean | 13 | 4 | 0.15* | 10 | 6 | |
| b.Elective caesarean | 4 | 4 | | 5 | 4 | 8.48* |
| 5.  Time of ambulation | | | | | | |
| a.Between 16-19 hours | 9 | 4 | 0.65* | - | - | - |
| b.Between 20-24 hours | 8 | 4 | | - | - | |

P < 0.05; * = Not significant

$H_{07}$:     There will be no association between maternal outcome on the second postnatal day of group I (early ambulation) and group II and selected variables at 0.05 level**.**

The findings in Table 23 show that there was no association between the infant caring behaviour on the second postnatal day and the selected variables in both the groups at 0.05 level. Hence, the null hypothesis ($H_0$) is accepted.

**Summary**

This chapter dealt with analysis and interpretation of the data collected from mothers who underwent caesarean section. Descriptive and inferential statistics were used for analysis. It was shown that early ambulation was effective in terms of breast feeding frequency and duration, successful rooming in and positive maternal feelings of wellbeing. There was no difference in breast feeding frequency and duration and 'rooming in' in the mothers of both the group on the fourth postnatal day. The mothers who were ambulated early had more amount of lochia compared to that of mothers who were ambulated after 24 hours. It also showed that mothers in both the groups had no risk of occurrence of deep vein thrombosis and had normal involution of the uterus.

# DISCUSSION

"Life's challenges are not supposed to paralyze you; they're supposed to help you discover who you are."

—Bernice Johnson Reagon

This chapter presents the major findings of this study and discusses them in relation to similar studies conducted by other researchers. The main aim of this study was to determine the impact of early and late ambulation on the maternal outcome of mothers with caesarean birth.

**Objectives of the study**

- To determine the impact of early ambulation on maternal outcome of mothers with caesarean birth (group I).
- To determine the impact of late ambulation on maternal outcome of mothers with caesarean birth (group II).
- To compare the maternal outcome among group I and group II.
- To determine the association between maternal outcome on the second postnatal day and selected variables in group I and group II.

**Hypotheses**

$H_1$: There will be a significant relationship between early ambulation and maternal outcome in group I.
$H_2$: There will be a significant relationship between late ambulation and maternal outcome in group II
$H_3$: There will be a significant difference between mean scores of maternal outcome of group I and group II.
$H_4$: There will be a significant association between maternal outcome on the second postnatal day and selected variables in group I and group II.

**Major findings of the study**

**Sample characteristics**

- Fifty two percent and forty eight percent of the sample in group I and group II respectively fell into the age group of 21-25 years; 28% and 40% of the samples in group I and group II respectively were aged between 26 and 30 years.
- 50% of the mothers in group I had previous vaginal deliveries and 62.5% of the mothers in group II had previous vaginal deliveries.
- Forty percent of the samples of group I and 56% of the samples in group II had primary education; 28% of the samples in group I and 20 % of the samples in group II had secondary education.
- Sixty eight percent of the samples in both the groups were Muslims.
- Forty four percent of the mothers in group I had ambulated in the 16th- 17th hour of the surgery and 100% of the mothers in group II ambulated after 24 hours of the surgery.
- Seventy two percent of the mothers in group I had initiated breast feeding between 2-6 hours of the surgery and 36% of the mothers in group II had initiated breast feeding between 6-12 hours of the surgery.

**Infant caring behaviour of mothers with caesarean birth**

The findings of the study revealed that 88%, 100%, 100% of the samples in group I had adequate infant caring behaviour (breast feeding, rooming in and maternal feelings of wellbeing) on the second, third and fourth postnatal day respectively. whereas 16%, 84%, 100% of the samples in group II had adequate infant caring behaviour (breast feeding, rooming in and maternal feelings of wellbeing) on the second, third and fourth postnatal day respectively. Infant caring behaviour score of respondents of group I ranged from 11-16, 15-16 and 16 (maximum score=16) and that of group II ranged from 4-13, 12-16, 15-16 (maximum score=16) on the second, third and fourth postnatal day respectively.

The mean infant caring behaviour scores of group I was 14, 15.6 and 16 and that of the group II was 8.44, 14.28 and 15.84 on the second, third and fourth postnatal day respectively. The findings of this study are consistent with the findings of the other studies which were conducted to assess the breast feeding, rooming in and maternal feelings of wellbeing in mothers with caesarean birth (Datta, 1990; Flores-Huerta, 1997; Procainoy, 1984; http://tropej.oxfordjournals.org/cgi/pdf_extract/30/1/39).

**Occurrence of deep vein thrombosis, involution of the uterus and lochia of mothers with caesarean birth**

Hundred percent of mothers of both the groups did not have the risk of occurrence of deep vein thrombosis and 100% of the mothers of both the groups had normal involution of the uterus. Lochia scores of respondents of group I ranged from 256-288, 152-184 and 48-69 and that of group II ranged from 229-272, 124-146, 49-88 on the second, third and fourth postnatal day respectively. The mean lochia scores of group I was 268, 165 and 57 and that of the group II was 248, 138 and 70 on the second, third and fourth postnatal day respectively. The findings of this study are consistent with the findings of a literature search performed to understand the tortuous history of the implementation of early ambulation after delivery where no negative effects of implementation of early ambulation were found and the results included prevention of venous thrombosis, rapid involution of the uterus and genitals, fewer uterine prolapses and retroflexions, less fever, less pneumonia, less blood in the lochia and a better state of mind (Stralen, 2007).

**Impact of early ambulation on maternal outcome**
The findings revealed that the Infant caring behaviour score and lochia scores of group I was significantly higher after early ambulation than the mean Infant caring behaviour score and lochia score of group II on the second and third postnatal day. The Infant caring behaviour score of group I on the fourth postnatal day was same as the mean Infant caring behaviour score of group II. The mean lochia scores of group I was significantly lower than the mean lochia scores of group II on the fourth postnatal day whereas there was no difference between the two groups in occurrence of deep vein thrombosis and involution of the uterus. The findings of the study suggest that early ambulation was an effective method to improve the maternal outcome of mothers with caesarean birth. The statistical analysis demonstrated a highly significant improvement in the maternal outcome of mothers with caesarean birth in group I after providing early ambulation (t=49, p<0.05).

The findings of this study are consistent with the findings of the comparative study on mininvasive abdominal aortic surgery which was conducted to assess the effectiveness of the multidisciplinary clinical programme versus a standard group receiving standard anaesthesia care, standard surgical and nursing program where the results showed that the multidisciplinary group had better pain relief, earlier restoration of ambulation, earlier feeding, passage of stools and lower incidences of complications. In another prospective randomized study which assessed early ambulation and delayed ambulation after hip surgery the results showed that at 1 week post-surgery, patients in the Early ambulation group walked further than those in the delayed ambulation group (P = 0.03), were more likely to be discharged directly home from the acute care than those in the delayed ambulation group (26.3 compared with 2.4%) and were less likely to need high-level care (36.8 compared with 56%) (Oldmeadow et al., 2006).

**Association of infant caring behaviour and selected variables**

The Fisher's exact test computed showed that there was no association between the infant caring behaviour 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). The mothers co-operated well with the investigator in conducting the study.

**Summary**

The findings of this study and other studies show that early ambulation is effective in improving the maternal outcome of mothers with caesarean birth. The next chapter deals with suggestions and recommendations for further study based on the findings of the present study.

# REFERENCES

Abdellah FG. 1986. Better patient care through nursing research. New York: The Macmillan Company.

Arjun G. 2008. Caesarean section: Evaluation, guidelines and recommendations. Indian J Med Ethics [serial online] Jul-Sep [cited 2009 Aug 21];5(3). Available from: URL:http://www.ijme.in/cgi-bin/getpdf.cgi

Basavanthappa BT. 2003. Nursing research. 1st ed. New Delhi: Jaypee Brothers Medical Publishers Pvt. Ltd.

Bonnet F, Szymkiewicz O, Marret E, Houry S. 2006. Rehabilitation after abdominal surgery. Presse Med [serial online] Jun [cited 2009 Aug 16]; 35:1016-22. Available from: URL:http://web.ebscohost.com/ehost/detail?vid=22&hid=15&sid=e0e7dfb7-78d040eaacd53053bad80737%40sessionmgr7&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d

Browning L, Denehy L, Scholes RL. 2007. The quantity of early upright mobilization performed following upper abdominal surgery is low: an observational study. *Aust J Physiother*;53(1):47-52.

Brustia P, Renghi L, Gramaglia L, Porta C, Cassatella R, De Angelis R et al. 2003. Mininvasive abdominal aortic surgery early recovery and reduced hospitalization after a multidisciplinary approach. *J Cardiovasc Surg,* 44:629-35

Buranasin B. 1991. The effects of rooming-in on the success of breastfeeding and the decline in abandonment of children. Asia Pac J Public Health [serial online] [cited 2009 Aug 13]; 5(3):217-20. Available from:

URL:http://www.ncbi.nlm.nih.gov/pubmed/1823804?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_Results
Panel.Pubmed_SingleItemSupl.Pubmed_DiscoveryRA&linkpos=2&log$=relatedarticles&logdbfrom=pubmed

Cakmak H, Kuguoglu S. 2007. Comparison of breast feeding patterns of mothers who delivered their babies per vagina and via caesarean section: an observational study using the LATCH breastfeeding charting system. *Int J Nurs Stud.,* 44:1128-37.

Centers for Disease Control and Prevention. Breastfeeding: Data and statistics: Breastfeeding practices. [Online]. [2007?] [cited 2008 Oct 15]; available from: URL:http://www.cdc.gov/breastfeeding/data/NIS_data/data_2004.htm

Chertok LR. 1996. Breast-feeding initiation among postcaesarean women of Negev, Israel. Br J Nurs 2006; 15(4):205-08.

Cockram J, Jenkins S, Clugston R. 1999. Cardiovascular and respiratory responses to early ambulation and stair climbing following coronary artery surgery. Physiother Theory Pract; 15:3–15

Datta T. 1990. Breast feeding in cesarean babies. Indian Pediatr [serial online] Jan [cited 2009 Aug 14]; 27(1):86-7. Available from: URL:http://www.ncbi.nlm.nih.gov/pubmed/2361749

Dharamraj C, Sia CG, Kierney CMP, Parekh A, Harper RG et al. 1981. Observations on Maternal Preference for Rooming-in Facilities. Pediatrics [serial online] May [cited 2009 Aug 13]; 67(5):638-40. Available from: URL:http://pediatrics.aappublications.org/cgi/content/abstract/67/5/638

DiMatteo MR, Morton SC, Lepper HS, Teresa M, Camey MF, Pearson M et al. Caesarean childbirth and psychosocial outcomes: a metaanalysis. *Health Psychol,* Jul; 1(4):303-14.

Dutta DC. 2004. Textbook of obstetrics. 6th ed. New Delhi: new central book agency.

Ever-Hadani P, Seidman DS, Manor O, Harlap S. 2009. Breast feeding in Israel: maternal factors associated with choice and duration. J Epidemiol Community Health [serial online] 1994 [cited Aug 12]; 48:281-285. Available from: URL:http://jech.bmj.com/cgi/content/abstract/48/3/281

Flores-Huerta S, Cisneros-Silva I. 2009. Mother-infant rooming-in and exclusive breast feeding. Salud Publica Mex [serial online] 1997 Mar [cited Aug 13]; 39(2):110-6. Available from: URL:http://www.ncbi.nlm.nih.gov/pubmed/9254434

George JB. Nursing theories: the base of professional nursing practice. 5th ed. New Jersey: Prentice Hall.

Halpern SH, Levine T, Wilson DB, MacDonell J, Katsiris SE, Leighton BL. 1999. Effect of Labor Analgesia on Breastfeeding Success. Birth [serial online] Jun [cited 2009 Aug 14]; 26 (2):83-88. Available from: URL:http://www.ingentaconnect.com/ content/bsc/bir/1999/00000026/00000002/art00083

Hannah ME, Hannah WJ, Hodnett ED, Chalmers B, Kung R, Willan A et al. 2009. Outcomes at 3 Months After Planned Cesarean vs Planned Vaginal Delivery for Breech Presentation at Term. JAMA [serial online] April [cited 2009 Aug 13]; 287(14):1822-31. Available from: URL:http://jama.amaassn.org/cgi/content/abstract/287/14/1822

Ip S, Chung M, Raman R, Chew P, Magula N, DeVine D et al. 2007. Breastfeeding and maternal and infant health outcomes in developed countries. Evid Rep Technol Assess [serial online] April [cited 2009 Aug 14]; 153:1-415. Available from: URL:http://www.ahrq.gov/clinic/tp/ brfouttp.htm.

Kapil U, Kaul S, Vohra G, Chaturvedi S. 1992. Breast feeding practices amongst mothers having undergone caesarean section. Indian Pediatr [serial online] Feb [cited 2009 Aug 14]; 29:222-24. Available from: URL:http://indianpediatrics.net/feb1992/222.pdf

Karlstrom A, Engstrom-Olofsson R, Norbergh K, Sjoling M, Hildingsson I. Postoperative pain after caesarean birth affects breast feeding and infant care. J Obstet Gynaecol Neonatal Nurs 2007 Sep; 36(5):430-40.

Lamar R, Court M, Robertson P, Weiner S, Caughey A. 2007. Are women less likely to breast feed after pregnancy complications. *Am J Obstet Gynaecol* Dec;197(6): S95

Leonard GM, Tremblay LE, Chabot M, Lariviere J, Papadopoulos. 2007. The effects of early continuous passive motion after total knee arthroplasty. *Physiother Can*; 59(2):111-17.

Mackay MR, Ellis E, Johnston C. 2009. Randomised clinical trial of physiotherapy after open abdominal surgery in high risk patients. Aust J Physiother [serial online] 2005 [cited Aug 13]; 51(3):151-59. Available from: URL:www.cinahl.com/cgi-bin/refsvc?jid=654&accno=2009031902

Malhotra N, Khanna S, Pasrija S, Jain M, Agarwala RB. 2005. Early oral hydration and its impact on bowel activity after elective caesarean section—our experience. *Eur J Obstet Gynecol Reprod Biol120*: 53–56

Myles MF. 1982. Textbook for midwives. 9th ed. Edinburgh: Churchill Livingstone.

Oldmeadow LB, Edwards ER, Kimmel LA, Kipen E, Robertson VJ, Bailey MJ. 2006. No rest for the wounded: early ambulation after hip surgery accelerates recovery. ANZ J Surg [serial online] [cited 2009 Aug 13]; 76:607–11. Available from: URL:http://web.ebscohost.com/ehost/detail?vid=6&hid=2&sid=a032666e-b48c4fd083b96faa8b8f0e75%40sessionmgr3&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%d%3d#db=mnh&AN=16813627

Orfanos P, Ellis E, Johnston C. 1999. Effects of deep breathing exercises and ambulation on pattern of ventilation in post-operative patients. Aust J Physiother [serial online] [cited 2009 Aug 14]; 45(3):173-82. Available from: URL:www.cinahl.com/cgi-bin/refsvc?jid=654&accno=1999071726

Pérez-Escamilla R, Maulén-Radovan I, Dewey K G. 1996. The association between cesarean delivery and breast-feeding outcomes among Mexican women. Am J Public Health Jun; 86(6): 832-36.

Pillitteri A. 1995.Maternal and child health nursing. 2nd ed. Philadelphia: J B Lippincott company.

Polit DF, Hungler BP. 1999. Nursing research: Principles and methods. 6th ed. Philadelphia: J. B. Lippincott Company.

Procainoy RS, Fernanades-Filho PH, Lazaro L, Sartori NC. Factors affecting breast feeding: the influence of caesarean section. J Trop Pediatr [serial online] 1984 [cited 2009 Aug 16]; 30(1):39-42. Available from: URL:http://tropej.oxfordjournals.org/cgi/pdf_extract/30/1/39

Qiu L, Binns C, Zhao Y, Lee A, Xie X. 2008. Breastfeeding following caesarean section in Zhejiang Province: public health implications. Asia Pac J Public Health [serial online] Oct [cited 2009 Aug 14]; 20:S220-7. Available from: URL:http://www.ncbi.nlm.nih.gov/pubmed/19533885

Risks for the mother Caesarean section [Online]. 2009 Mar 17 [cited 2009 Aug 21]; Available from: URL:http://en.wikipedia.org/wiki/Caesarean_section

Sharma S, Monga D. 2008.Venous thromboembolism during pregnancy and the post-partum period: Incidence and risk factors in a large Victorian health service. *Aust N Z J Obstet Gynaecol,* 48(1): 44-49.

Shittu OS, Ojengbede OA, Wara LHI. 2007. A review of postoperative care for obstetric fistulas in Nigeria. *Int J Gynaecol Obstet,* 99:S79-S84.

Siu AL, Penrod JD, Boockvar KS, Koval K, Strauss E, Morrison RS. 2006. Early ambulation after hip fracture: effects on function and mortality. Arch Intern Med [serial online] 2006 Apr 10 [cited 2009 Aug 14]; 166(7):766-71. Available from: URL:http://web.ebscohost.com/ehost/detail?vid=6&hid=2&sid=a032666e-b48c4fd083b96faa8b8f0e75%40sessionmgr3&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d

Steadman's Medical Dictionary. Philadelphia: Lippincott Williams and Wilkins; 2006. Impact

Stralen KJ , Terveer EM, Doggen CJM, Helmerhorst FM, Vandenbroucke JP. 2007. Tortuous history of the implementation of early ambulation. *J R Soc Med.*, Feb; 100(2):90-96.

Tiran D. Bailliere's midwives' dictionary. 9th ed. Toronto: Bailliere Tindall. Labour.

Yamauchi Y, 2008. Yamanouchi I. The Relationship between Rooming-in/not Rooming-in and Breast-Feeding Variables. Acta Paediatr Jan 21; 1990; 79(11):1017-22.

*******