

**EFFECTIVENESS OF COCONUT OIL MASSAGE ON
WEIGHT GAIN AMONG LOW BIRTH WEIGHT
NEWBORNS IN JAMES MULTISPECIALITY
HOSPITAL AT KANYAKUMARI DISTRICT.**



DISSERTATION SUBMITTED TO
THE TAMILNADU DR.M.G.R.MEDICAL UNIVERSITY
CHENNAI
IN PARTIAL FULFILLMENT FOR THE DEGREE OF
MASTER OF SCIENCE IN NURSING
APRIL 2012

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BY

Mrs. S.EVANGELIN SALLY



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SRI. K. RAMACHANDRAN NAIDU COLLEGE OF NURSING

Affiliated to The Tamil Nadu Dr. M.G.R. Medical University,

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OIL MASSAGE ON WEIGHT GAIN AMONG LOW BIRTH
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- Psalms

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TABLE OF CONTENTS

CHAPTERS	TITLE	PAGE NO
I	INTRODUCTION	1- 13
	Background of the study	1
	Need for the study	4
	Statement of the problem	7
	Objectives	7
	Hypotheses	8
	Operational definition	8
	Assumption	9
	Delimitation	9
	Projected outcome	10
	Conceptual framework	11
	II	REVIEW OF LITERATURE
Literature review		14
III	RESEARCH METHODOLOGY	28 - 36
	Research approach	28
	Research design	28
	Variables	29
	Setting of the study	29
	Population	29
	Sample	30
	Sample size	30
	Sampling technique	30
	Criteria for sample selection	30
	Development and description of the tool	31
	Intervention	32
	Content validity	32
	Reliability of the tool	32
	Pilot study	33

CHAPTERS	TITLE	PAGE NO
	Data collection procedure	34
	Plan for data analysis	34
	Protection of human rights	35
IV	ANALYSIS AND INTERPRETATION OF DATA	37 - 66
	Organization of data	37
	Presentation of data	39
V	DISCUSSION	67- 73
VI	SUMMARY , CONCLUSION, IMPLICATIONS, LIMITATIONS AND RECOMMENDATIONS	74 - 80
	BIBLIOGRAPHY	
	APPENDICES	

LIST OF TABLES

TABLE NO	TITLE	PAGE NO
1.	Frequency and percentage distribution of demographic variables of the mother	39
2.	Frequency and percentage distribution of demographic variables of the newborn.	44
3.	Frequency and percentage distribution of pretest level of baby weight among experimental and control group.	49
4.	Frequency and percentage distribution of post test level of weight gain after coconut oil massage in both experimental and control group.	51
5.	Comparison of posttest level of weight gain among experimental and control group.	53
6.	Comparison of pre and posttest level of baby weight among experimental group.	55
7.	Comparison of pre and posttest level of baby weight among control group.	56
8(a).	Association of weight gain of the experimental group with demographic variables of the mother.	59
8(b).	Association of weight gain of the experimental group with demographic variables of the newborns.	61
8(c).	Association of weight gain of the control group with demographic variables of the mother.	63
8(d).	Association of weight gain of the control group with demographic variables of the newborns.	65

LIST OF FIGURES

FIGURE NO	TITLE	PAGE NO
1.	Conceptual framework based on modified Ludwig von Bertalanffy's general system theory	13
2.	Schematic representation of research design	28
3.	Schematic representation of research methodology	36
4.	Percentage distribution of demographic variables of age of the mother in experimental and control group.	41
5.	Percentage distribution of demographic variables of type of family in experimental and control group.	41
6.	Percentage distribution of demographic variables of family income in experimental and control group.	42
7.	Percentage distribution of demographic variables of mode of delivery in experimental and control group.	42
8.	Percentage distribution of demographic variables of weight gain during pregnancy in experimental and control group.	43
9.	Percentage distribution of demographic variables of age of the newborns in experimental and control group.	46
10.	Percentage distribution of demographic variables of sex of the newborns in experimental and control group.	46
11.	Percentage distribution of demographic variables of birth weight of the newborns in experimental and control group.	47
12.	Percentage distribution of demographic variables of gestational age of the newborns in experimental and control group.	47

13.	Percentage distribution of demographic variables of newborns type of feeding in experimental and control group.	48
14.	Percentage distribution of pre test level of baby weight among experimental group.	50
15.	Percentage distribution of pre test level of baby weight among control group.	50
16.	Percentage distribution of post test level of weight gain in both experimental and control group.	52
17.	Comparison of posttest level of weight gain among experimental and control group.	54
18.	Comparison of pre and posttest level of baby weight gain among experimental group.	56
19.	Comparison of pre and posttest level of baby weight gain among control group.	58

LIST OF APPENDICES

APPENDIX	TITLE
A	Letter seeking permission for conducting the study
B	Letter seeking opinion for content validity of the tool
C	List of experts for content validity
D	Certificate of English editing
E	Informed consent
F	Copy of the tool for data collection
G	Scoring key
H	Intervention

ABSTRACT

"A study to assess the effectiveness of coconut oil massage on weight gain among low birth weight newborns in James Multispeciality Hospital at Kanyakumari district" was conducted by Mrs.S.Evangelin Sally in partial fulfillment of the requirement for the Degree of Master of Science in nursing at Sri. K.Ramachandran Naidu College of nursing, under the Tamil Nadu Dr.M.G.R.Medical University.

The objectives of the study were:

1. To assess the pretest level of weight among low birth weight newborns in experimental and control group.
2. To find out the effectiveness of coconut oil massage on weight gain among low birth weight newborns in experimental and control group.
3. To compare the pretest and posttest level of weight gain among experimental group.
4. To compare the pretest and posttest level of weight gain among control group.
5. To associate the posttest level of weight gain among experimental and control group of low birth weight newborns with their selected demographic variables

The following hypotheses were set for the study:

- H₁ The mean post test level of weight gain among low birth weight newborns in experimental group was significantly higher than the mean post test level of weight gain in control group.
- H₂ There was a significant difference between mean pre test and mean post test level of weight gain among experimental group.

H₃ There was a significant difference between mean pre test and mean post test level of weight among control group.

H₄ There was a significant association between post test level of weight gain among low birth weight newborns in experimental and control group with their selected demographic variables.

The experimental quantitative approach was used. The study was conducted in James Multispeciality Hospital, Colachel, at Kanyakumari District. The design adopted for the study was quasi experimental pre test and post test control group design to evaluate the effectiveness of coconut oil massage on weight gain among low birth weight newborns. Convenient sampling technique was used to select 60 low birth weight newborns in James Multispeciality Hospital among those 30 samples for experimental group and 30 samples for control group.

The data collection tool was used for this study is Electronic Infant Weighing Scale. The content validity of the tool was established by one medical expert and five nursing experts in the field of pediatrics. Pilot study was conducted to find out the feasibility of the study and plan for analysis.

Data collection was done and the data obtained were analyzed in terms of both descriptive and inferential statistics.

The major findings of the study were:

1. There was a significant difference in post test level of weight gain among experimental and control group ($t = 10.25$) at $p < 0.05$ level.
2. There was a significant difference between pre and post test level of weight gain among experimental group ($t = 27.09$) at $p < 0.05$ level.

3. There was a significant difference between pre and post test level of weight gain among control group ($t = 16.05$) at $p < 0.05$ level.
4. There was no statistically significant association of post test level of weight gain among experimental and control group with selected demographic variables except sex of the newborn in experimental group.

Based on the findings of the study it is recommended that,

1. Similar study can be replicated on a large sample.
2. Study can be conducted to assess the effectiveness of coconut oil massage on less stress behavior, neuro motor development, infant parent bonding and improved sleep.
3. Study can be conducted in pre – term newborns.
4. A comparative study can be conducted by using coconut oil versus other different oils to weight gain.
5. Study could be replicated in different setting with large sample to validate the findings.

Recommendations based on the suggestion of the study subjects:

1. Nurses and health care providers play a vital role in motivating the mothers to practice coconut oil massage.
2. Pediatric nurses need to take up the responsibility to create awareness among the mothers of low birth weight newborns regarding weight gain.
3. Nursing practice in the community should focus on practice of coconut oil massage and promotion of weight gain.

CONCLUSION

This study assessed the effectiveness of coconut oil massage on weight gain among low birth weight newborns. The mean difference between pre test and post test level of weight gain in experimental group was 0.27 at $p < 0.05$ level. The low birth weight newborns who were received coconut oil massage had a significant weight gain compared to the low birth weight newborns that who were not received coconut oil massage.

CHAPTER I

INTRODUCTION

"Touch your baby, shape their tomorrow"

- *Unknown*

BACKGROUND OF THE STUDY

The miracle of human life begins at conception and continues throughout the life. The birth of an infant is one of the most awe inspiring and emotional events that can occur in one's life time.

Normal birth weight for a healthy neonate born at term between 38 to 42 weeks on an average is 2.7 to 3.1kg. Infants born at term or post term may weigh less than 2500grams is considered to be low birth weight babies.

According to **WHO**"Low birth weight is defined as one that birth weight is 2500 grams or less irrespective of the gestational age".

In India about 30 to 40 percent neonates are born with low birth weight. Approximately 80 percent of neonatal deaths and 50 percent of infant deaths are related to low birth weight. High incidence of low birth weight in our country is due to higher number of babies with growth retardation (small for dates) rather than preterm babies. The baby with less weight is more vulnerable and need special care. About 10 percent of all low birth weight babies require admission to the special care nursery (**ParulDatta, 2007**).

The causes of babies born with low birth weight are premature birth, fetal growth restriction, babies born with birth defects, chronic health problems of the mother, pregnant women who smoke cigarettes, alcohol and drug intake, maternal infections, fetal infections,

placental problems, inadequate maternal weight gain, low socio economic status and lack of education.

Low birth weight babies are more prone to develop the complications like malnutrition, infections, neuro developmental handicapped conditions, impaired immune function and increased risk of diseases. They are more vulnerable to get hypertension, diabetes mellitus, and coronary artery diseases in adult life. They also tend to have reduced muscle strength, cognitive disabilities, lower intelligent level in school and their job opportunities as adult(**Susan & James, 2010**).

Prevention and reduction in incidence of low birth weight babies is the most important strategy to reduce perinatal, natal and infant mortality rates and improve the quality of life among those who survive. Breast feeding, expressed breast feeding, spoon or paladai feeding and intravenous dextrose solution can be given to low birth weight babies for gaining their weight. But these interventions take longer time to gain weight.

Neonatal and infant massage was first introduced in China in 2ndCentury BC. Massaging the newborn has been a tradition in India and other Asian countries since time immemorial. Massage therapy is the manipulation of soft tissues. The word "massage" derived from the latin word 'massa' or 'green massein' or ' masso'. Massage therapy is a natural and almost instructive way of care. By lightly touching and rubbing the entire body causes comfort both physically and mentally. The practice of neonatal massage helps to improve the growth and development of low birth weight neonates. Various oil based preparations have been used depending on the regional availability. (**Dr.AnjaliKulkarini, 2010**).

Typically oil application is routinely practiced in many countries. For hundreds of years, populations especially in Indian subcontinent have routinely applied natural oil to the skin of newborn. The practice of oil massage is practiced now a day in the developed countries as well.

As evidenced in recent years coconut oil massage to low birth weight babies' skin can be absorbed systematically and serve nutritional purposes. Serum triglycerides level were significantly raised in the blood, thus improves weight gain among low birth weight babies who received coconut oil application (**Field et al., 2003**).

Coconut oil is light, non - greasy liquid oil. It consists of more than 90% of saturated fats. But it will not harmful as it happens in case of other vegetable oils. It does not increase the low density lipoprotein level. Most of them are medium chain triglycerides. These triglycerides provide better weight gain. Coconut oil is less pricey and easily available.

The other benefits of the coconut oil massage includes stimulation of circulatory system, less stress behavior, neurological and neuromotor development, improved sleep, thermoregulation, improved skin condition and barrier function, resulting in reduced loss of transepidermal water and transcutaneous absorption of fatty acids contributing to improved nutrition and better somatic growth.

A study on compare the effect of massage with coconut oil versus mineral oil and placebo on growth velocity. The open randomized controlled trial was conducted in neonatal care unit and the post natal ward of a major tertiary care centre in a metropolitan city. A total of 224 babies (112 preterm and 112 term babies) were enrolled. In each gestation strata, there were 38 babies in coconut oil, 37 babies in mineral oil and 37 in

placebo group. Oil massage was given from second day of life till discharge. The total duration of each session was five minutes and was done four times a day. The researchers observed that weight in the coconut oil group was significantly higher as compared to the mineral oil and placebo group. The weight gain was 9.19 ± 1.55 gms/kg/day in term neonate group who applied coconut oil. They concluded that the weight gain velocity was significantly higher in the coconut oil group as compared to the other subgroups and the difference was statistically significant (**Sankaranarayanan et al., 2003**).

A conducive environment needs to be established before initiation of coconut oil massage. A room with soft light, warm temperature, and low noise level is ideal. Coconut oil massage should be given between feeds and ideally 45 minutes to 1 hour after feed to avoid regurgitation or vomiting of a feed. Twenty milliliters of Coconut oil applied the entire body starting from the head, neck, chest, abdomen, back and extremities. It is given for 15 minutes (**Field et al., 2003**).

Coconut oil massage is considered as a safe practice and there are no significant harmful effects, if performed appropriately. And this is cost effective, traditionally practiced and culturally acceptable.

NEED FOR THE STUDY

Low birth weight is a public health problem in most developing countries, in which an estimated 15 percent of births result in low birth weight. Babies who are undernourished in the womb face a greatly increased risk of dying during their early months and years.

Low birth weight stems primarily from poor maternal health and nutrition and short stature. Insufficient antenatal weight gain is a principal cause of fetal growth retardation. Teenagers who give birth, when their own bodies not yet to finish growing also have a greater risk of bearing under weight babies.

Moreover maternal diseases that are common in developing countries, such as hypertension, diabetes mellitus, thyroidism, malaria etc can significantly impair fetal growth. In addition, a heavy physical workload during pregnancy may also negatively affect birth weight of the baby.

Globally, it is estimated that 25 million low birth weight neonates were born. In south Asia which has the highest incidence of low birth weight babies, that figure is over 70 percent. The 90 percent of low birth weight newborns were born belonged to the developing countries only (**UNICEF & WHO, 2010**).

In India, 30 percent to 35 percent babies are having low birth weight. The lowest incidence of low birth weight was approximately 30percent of babies were reported in New Delhi(**AnjuAgarwal, 2009**).

In India,prevalence of low birth weight babies are more among rural mothers when compared to urban mothers with low birth weight rate of 24 percent and 14.7 percent respectively(**Kathy Jones, 2011**).

In TamilNadu, 26 percent of the newborns are born with low birth weight in rural area, 17 percent of the population had low birth weight and out of them 60 percent due to poor socio economic status(**Thomas, 2010**).

In many Western cultures health staff and independent practitioners are undertaking training to teach infant massage techniques to parents of healthy babies in the community with the aim of promoting mother-infant interaction, optimal infant anthropometric development and preventing infection(**Angela Underdown, et al., 2009**).

Massaging neonates and infants has been an important component of infant rearing in many traditions, especially in India. Massage of newborn may be done using a lubricant or oil to avoid friction between the surfaces. Body oils can be classified as essential fatty acid rich oil (e.g) safflower oil and saturated fatty acid rich oil (e.g) coconut oil. Coconut oil is especially rich in medium chain triglycerides, which are known to have different absorptive mechanisms from the gut and are easily metabolized in the body (**KirthiSolonki, 2005**).

Physical properties of coconut oil contain predominantly medium chain triglycerides with roughly 92 percent saturated fatty acids, 6 percent of monounsaturated fatty acids and 2 percent of polyunsaturated fatty acids. Coconut oil is primarily 44.6 percent lauric acid, 16.8 percent of myristic acid, 8.2 percent palmitic acid and 8 percent of caprylic acid (**Stance Equine, 2011**).

Coconut oil massage might promote growth of the newborn. The mechanism by which coconut oil massage increased vagal activity and secretion of insulin and gastrin for improving the absorption of food (**Uvnas-Moberg, 1987**).

Massage with coconut oil showed a better weight gain velocity as compared to massage without oil. Thus the researchers reported coconut oil massage increases the fatty acid level and improves the growth in neonates (**Field et al., 2005**).

The effect of coconut oil massage on low birth weight neonates was evaluated. Twenty six matched neonates served as controls. Fifteen minutes of oil massage was carried out two times a day for five days, starting from eighth day to twelfth day after birth. The results shown that weight gain was there when compared with control group. And the researchers concluded coconut oil massage stimulates growth velocity (**Dr.D.R.Dabi&Usha Kothari, 2009**).

It was also seen that there was a significant increase in gastric motility in post massage period. The study shown that significant increase in vagal activity was noticed during the period of 15 minutes of coconut oil massage therapy for 5 days. It was postulated that massage causes increase in vagal activity, hence improved gastric motility; this leads to better absorption of nutrients resulting in better weight gain(Diego et al., 2005).

During the clinical experience the researcher observed that the low birth weight babies getting admission in NICU took long time to gain weight inspite of proving interventions like expressed breast feeding or breast feeding, putting the baby under warmer and giving kangaroo care. This lead to a lengthier hospital stay, high expenses and the chance of getting nasocomial infection.

Thus the researcher interested in doing a study regarding coconut oil massage on weight gain which is cheaper, non invasive, has no side effects and traditionally acceptable.

STATEMENT OF THE PROBLEM

A study to assess the effectiveness of coconut oil massage on weight gain among low birth weight newborns in James Multispeciality Hospital at Kanyakumari District.

OBJECTIVES

1. To assess the pre test level of weight among low birth weight newborns in experimental and control group.
2. To find out the effectiveness of coconut oil massage on weight gain among low birth weight newborns in experimental and control group.

3. To compare the pre test and post test level of weight gain among experimental group.
4. To compare the pre test and post test level of weight gain among control group.
5. To associate the post test level of weight gain among experimental and control group of low birth weight newborns with their selected demographic variables.

HYPOTHESES

Hypotheses will be tested at $p < 0.05$ level

- H₁ The mean post test level of weight gain among low birth weight newborns in experimental group will be significantly higher than the mean post test level of weight gain in control group.
- H₂ There will be a significant difference between mean pre test and mean post test level of weight gain among experimental group.
- H₃ There will be a significant difference between mean pre test and mean post test level of weight gain among control group.
- H₄ There will be a significant association between the post test level of weight gain among low birth weight newborns in experimental and control group with their selected demographic variables.

OPERATIONAL DEFINITIONS

Assess

It is the process of systematically collecting, validating and analyzing the weight gain in low birth weight newborns by electronic infant weighing scale.

Effectiveness

It refers to the extent to which an oil massage improves the weight of low birth weight newborns.

Coconut Oil Massage

It refers to the application of 20ml of coconut oil to the entire body of low birth weight newborns for two times a day with the duration of 15 minutes.

Weight Gain

It refers to an increase in body weight. This can be either an increase in muscle mass and fat deposits.

Low Birth Weight Newborns

An infant born weighing less than 2500 grams regardless of gestational age.

ASSUMPTIONS

1. Low birth weight newborns may have the greatest health risk.
2. Low birth weight newborns may be preterm or full term newborns.
3. Oil massage may improve weight gain.

DELIMITATIONS

1. The study was delimited to sample of 60 low birth weight newborns.
2. The study was delimited to low birth weight newborns who were admitted in James Multispeciality Hospital at Kanyakumari district.
3. The study was delimited to newborns with moderate low birth weight of 2000grams to 2500grams.
4. The study was delimited to the period of four weeks.

PROJECTED OUTCOME

- Application of coconut oil massage will improve weight gain among low birth weight newborns.
- The findings of the study will help the nurses to apply coconut oil massage among low birth weight newborns for improving the weight gain.

CONCEPTUAL FRAMEWORK

The conceptual framework for research study presents the measure on which the purpose of the proposed study is based. The framework provides the perspective from which the investigator views the problem.

The study is based on the concept that the effectiveness of coconut oil massage on weight gain among low birth weight newborns. The investigator adopted the modified Ludwig Von Bertalanffy's general system theory.

Living system is open because there is an ongoing exchange of matter, energy and information. In general system theory, the system is composed of both structural and components that interact with in boundary, which filter the type and rate of exchange with the environment.

The newborn is capable of taking energy and information from the environment and revealing them to the environment. Because of this exchange, newborn is an open system.

According to general system theory for survival, newborn must achieve a balance internally and externally. Equilibrium depends on the newborn's ability to regulate input and output to achieve a balanced relation of the interactive part and the process applied for proper balance.

Ludwig Von Bertalanffy's general system theory focuses on three areas:

- Input
- Throughput
- Output

1. Input

According to general system theory input refers to the matter, energy or information from the environment into the system. Here the input includes mother's age, type of family, family income, mode of delivery, weight gain during pregnancy, newborn's age, sex, birth weight, gestational age and type of feeding. The main aspect of input is the assessment of weight and all are open systems which are interacting with each other.

2. Throughput

In this model throughput refers to the procedure by which matter, energy and information that is modified or transformed within the system. In the present study it includes application of coconut oil massage to low birth weight newborns in experimental group which is followed by post assessment level of weight gain by using Electronic infant weighing scale.

3. Output

Output refers to matter, energy and information that are released from the interaction of the system into the environment. In the present study it refers to the outcome of the system interaction that is effectiveness of coconut oil massage on weight gain among low birth weight newborns.

CHAPTER - II

REVIEW OF LITERATURE

Review of literature is defined as a critical summary of review on a topic of interest, often prepared to put a research problem in contest (**Polit& Beck, 2006**).

The review of literature in the research report is a summary of current knowledge about a particular practice problem and includes what is known and not known about the problem. The literature is reviewed to summarize knowledge for use in practices or to provide a basis for conducting a study (**Burns, 1997**).

This study examined the effects of coconut oil massage on weight gain among low birth weight newborns. From the collected review of various associated literature and research studies, topics can be divided as follow;

Section A – Studies related to prevalence of low birth weight babies.

Section B – Studies related to using massage therapy on weight gain.

Section C – Studies related to coconut oil massage on weight gain.

SECTION - A

STUDIES RELATED TO PREVALENCE OF LOW BIRTH WEIGHT BABIES

Bakker R et al., (2011) conducted a study to investigate the association between maternal age and birth outcomes. The design of the study is population-based prospective cohort study from early pregnancy onwards. The population of the study is 8568 mothers and their children. Maternal age was assessed at enrolment. Birthoutcomes were obtained from questionnaires and hospital records. Multivariate

linear and logistic regression analyses were used. The results shown that as compared with mothers aged 30 to 34.9 years, no differences in risk of preterm delivery were found. Mothers younger than 20 years had the highest risk of delivering small-for-gestational-age babies and low birth weight babies (OR 1.6, 95% CI: 1.1-2.5. Mothers older than 40 years had the highest risk of delivering large-for-gestational-age babies (OR 1.3, 95% CI: 0.8-2.4). They concluded that mothers aged 30 to 34.9 years; younger mothers have an increased risk of small-for-gestational-age babies, whereas older mothers have an increased risk of large-for-gestational-age babies

Tamaru S et al., (2010) in their extensive study, they clarify the relationship between prenatal risk factors and neuro developmental outcomes of very low birth weight and premature infants. The study design is a retrospective review. One hundred seventy Japanese women with a singleton pregnancy and their infants whose birth weight is less than 1500 grams were included. They classified the infants into 118 appropriate for gestational age and 52 small for gestational age. Infant's neuro developmental outcomes were evaluated by the Kyoto scale of psychological development 2001. They analyzed and compared the infant's outcomes and prenatal risk factors between two groups. The results shown that the developmental score of the cognitive adoptive area in Small for Gestational Age (SGA) infants was significantly lower than that in Appropriate for Gestational Age (AGA) infants.

Korvenranta E, et al., (2008) they assessed the effects of very low birth weight and prematurity related morbidities on health care costs during the fifth year of life. The study population consists of 588 very preterm children and 176 term control subjects born in 2001 to 2002. The effects of six prematurity related morbidities on the costs of health care were studied. The results shown that the health

care costs during the fifth year of life in very low birth weight infant with morbidities 1.4 fold and in those without morbidities 1.4 fold compared with those of term control subjects. This emphasizes the importance of prevention of morbidities to reduce the long term effects.

Tobon–CastarioA,et al.,(2008) the study investigated the relationship between gestational malaria and low birth weight in neonates of a malarial endemic region in Colombia between 1993 and 2007. The pattern of development in 1,716 neonates of women with and without malaria infection during pregnancy was evaluated in a cohort study. A total of 394 infected and 1,322 non infected pregnant women were selected as a sample. The results shown that exposure to gestational malaria was associated with increased risk of low birth weight (RR- 1.37; 1.03- 1.83). Low birth weight was 77% higher in infants of mothers with gestational malaria. The researcher concluded that low birth weight in neonates was associated with malaria during pregnancy.

Tierney – Gumaer R andReifsnider E (2008) conducted a study to compare the risk factors in women of Hispanic, African America and Anglo who delivered an infant of low birth weight in a large metropolitan country in south texas. A exploratory case comparison design was used to identify factors related to low birth weight outcomes in women receiving prenatal care. The cases were selected by stratified random sampling method. The sample size was 321. Dependent variable of maternal age, maternal race, education, smoking, prior pregnancy history, weight gain during pregnancy, past medical history and medical problems during pregnancy. This study confirmed that African American women are at higher risk of low birth weight deliveries and demonstrated that Anglo and Hispanic women have similar rates of low birth weight deliveries.

EmelAltuncu et al., (2008) conducted the study to identify the Low Birth

Weight (LBW) incidence in 5000 live born babies in the Bakirkoy maternity and children teaching hospital. Babies with Normal Birth Weight (NBW) chosen randomly in equal numbers from 5000 liveborn babies formed the control group. Presentation, route of delivery, congenital anomaly, multiple births and the sex of the infants were also recorded. The results shown that in the 5000 live born babies, incidence of LBW was 9.14 percent. The incidence of preterm and full term was 5.7 percent and 3.4 percent, respectively. Of the LBW infants, 62.8 percent were preterm, 37.2 percent were full term. The rate of multiple gestations was found to be 13.9 percent in LBW infants and 0.8 percent in NBW infants. Excluding multiple gestations, 46.4 percent of the babies in the LBW group were female, and 53.6 percent were male. In the NBW group, the rates were 46.3 percent and 53.7 percent respectively. Abdominal delivery was seen in 32.3 percent of the LBW infants and 21.6 percent in the NBW infants. The rate of breech presentation was higher in the LBW (5.1%) than in the NBW infants (1.3%). The incidence of congenital anomaly was 6.2 percent in the LBW group and 3.3 percent in the NBW group. The researchers concluded that the sex of the infant did not have any influence on the birth weight; however, multiple gestation and congenital anomaly were important factors. Additionally, abdominal delivery and non-vertex presentations were observed more frequently in the LBW infants.

Adamson & Harold (2007) conducted the study to determine the relationship between Low Birth Weight (LBW) maternal age and multiple pregnancies. A retrospective cross-sectional study was done where by data were obtained from labor ward register books and computer database of the MNH labor ward and analyzed by using EPI INFO version six computer program. A total of 6931 infants were studied. The results shown that the prevalence of LBW and multiple births were 26.4 percent

and 2.9 percent respectively. And there was no significant association between age of mother with LBW although a significant association between multiple pregnancy and LBW was noted.

Ianni A, et al., (2006) stated that to determine the relationship between preterm risk factors and neonatal death, cerebral hemorrhage and psychomotor development in Very Low BirthWeight (VLBW) infants. A retrospective analysis based on a multivariate logistic regression model was conducted on 253 VLBW infants. Cerebral hemorrhage was assessed by cerebral ultrasound screening within 24 hours of life, psychomotor development by Bailey Psychomotor and Development Index test. Pre-eclampsia and elective cesarean sections are statistically protective factors in the prevention of cerebral hemorrhage. Gestational age is a protective factor for neonatal death whereas, multiple pregnancy, symmetrically small for gestational-age infants, asphyxia at birth, altered cardio tomography, and cerebral hemorrhage are risk factors for neonatal death. The great number of obstetrical variables related to neonatal outcome makes it difficult to identify the really important steps, in obstetric management, to prevent long term sequel.

Chien LY et al.,(2003) stated in a study which was conducted in Taipei, Taiwan to examine biological, environmental, and demographic and health factors associated with very low birth weight. The study sample included 118 children born with very low birth weight and 170 non very low birth weight controls in Taiwan. Health related quality of life was measured using the Mandarin version of the TZOAZL preschool children quality of life instrument. This tool has four dimensions: physical, emotional, cognitive and social function. The study findings shown that children born with very low birth weight had significantly lower mean quality of life

score in all the four dimensions compared with control and primary care givers with higher educational levels and increased ages of the children were associated with improved scores in the emotional and social function. The researchers concluded that, regular monitoring of the quality of life among very low birth weight children is needed.

NaharN, et al., (1995) theprospective study was conducted in urban affluent, slum and rural communities of Bangladesh. From each community, 250 pregnant mothers were recruited in the study and at the end total 660 live births were studied to determine the incidence and risk factors of low birth weight. Incidence of low birth weight was highest in urban slum (36.8%) followed by rural area (20.9%) and lowest in urban affluent community (18.3%). The area of residence had a significant influence on birth weight suggesting that environmental stress had detrimental effect on birth weight. Age, weight and height of mothers were also risk factor for low birth weight of their babies. Mothers of less than 20 years and more than 35 years, weighing less than 40kg and having height less than 140cm had the higher risk of giving birth to low birth weight babies. Incidence of low birth weight was highest (73.2%) among the primigravidae mothers and 36.8 percent among the mothers who had no antenatal check-up, but it was 15.9 percent among those who had check-up more than seven times. The distribution of low birth weight babies was higher (48.2%) among the mothers who had never gone to school. To reduce the incidence of low birth weight, upliftment of socio-economic condition has got no alternative which is very much related to education level of the people. Emphasis should be given on mothers' education which is one of the influencing factors of birth weight of babies.

SECTION - B

STUDIES RELATED TO USING MASSAGE THERAPY ON WEIGHT GAIN

Gonzalaz AP, et al.,(2009) conducted a study on weight gain in preterm infants following massage therapy: A randomized controlled trial. Sixty clinically stable preterm newborns with a corrected gestational age of 30 to 35 weeks receiving enteral nutrition in the hospital. Half of were assigned at random to receive massage twice daily for ten days plus usual nursery care. The result showed that infants receiving massage had a better weight gain than the control group since third day. The researcher concluded that the preterm infants who receive massage therapy had good weight gain when compared to control group.

Ho YB, et al., (2009)stated a study to determine the effects of massage therapy on weight gain, and hospital discharge in preterm VLBW newborns. Twenty-four preterm VLBW newborns (<34weeks and <1500g) participated in this randomized controlled study. The intervention group (n=12) received massage therapy starting at 34 weeks post-conceptual age (15 minutes daily, five days a week for four weeks). The infants in the sham treatment group (n=12) received similar duration of light still touch. The results shown that in sub-group analysis, among those with below average pre-treatment TIMP score (<35), the intervention group (n=6) achieved significantly higher TIMP score gain (p=0.043) and earlier hospital discharge (p=0.045). They concluded that massage therapy might be a viable intervention to promote weight gain and reduce hospital stay.

Massaro AN,et al.,(2009) a prospective randomized clinical trial was conducted to evaluating the effects of massage with or without kinesthetic stimulation on weight gain among preterm infants. Infants were randomized to receive no

intervention, massage therapy alone or massage with kinesthetic stimulation. A total of 60 premature infants were recruited for this study. Twenty infants in each group. Weight was increased in the intervention group compared to control group. Thus the researcher concluded that massage with kinesthetic stimulation was relatively simple and inexpensive intervention that can improve weight gain in selected premature infants.

Chen LL, et al.,(2008) a double blind clinical trial was conducted in a medical centre in central Taiwan. The experimental group consists of 20 subjects were given a standard procedure of massage. Massage was given for 15 minutes per session, one hour per meals, and three times daily over ten days. The control group also consists of 20 subjects, underwent routine care and was observed. The infant's body weight and the volume of milk ingested were measured and recorded daily. The average weight gain of the infants in the experimental group was 32.7gram compared with 27.3gram in the control group. It was concluded that massage have a significant effect on weight gain in preterm infants.

Diego MA,et al.,(2007) performed a study to determine whether preterm infant massage leads to consistent increase in vagal activity and gastric motility that greater weight gain. Eighty preterm infants randomly assigned to a massage therapy group and a control group. The results were massaged infants exhibited consistent short term increases in vagal activity and the gastric motility and that were associated with weight gain during the five days treatment period.

Lee HK (2006) the study was conducted to test the effect of infant massage on weight with normal infants over a period of four weeks. This study was designed as a nonequivalent control group pre test–post test design. After four weeks of

massage there was significant difference in weight between the two groups. Overall, the results of this study assure that facilitates weight gain to the infants.

Field T, et al.,(2006) in this study 68 infants were randomly assigned to a moderate or to a light massage therapy group to receive 15 massages three times a day for five days. Weight gain was recorded over the five days massage therapy. The moderate pressure massage group gained significantly more weight than the light pressure massage group. Thus the researchers founded that moderate pressure massage therapy provides more weight than the light pressure massage therapy.

Lee HK (2005) conducted a study to evaluate the low birth weight infant's responses to infant massage. These response measured by checking weight. This study was conducted using an equivalent control pre test – post test design. The sample was divided into two groups of 13 infants with weight less than 2500 grams and no congenital anomalies. The experimental group received massage intervention twice daily for ten days. The results shown that the vagal tone was significantly higher after massage than before massage in the experimental group while no changes in the control group. They concluded that massage therapy enhances weight gain among low birth weight infants.

Dieter JN,et al.,(2003) investigated the effectiveness of massage therapy on weight gain among stable preterm infants. The massage was given for five days. Massage therapy was provided to 16 preterm neonates and 16 were in control group. Weight gain was assessed after five days of intervention. The massaged group averaged 53 percent greater daily weight gain than the control group. Results supported that massaged preterm infants gained more weight with just five days of massage therapy.

Feber SG, et al., (2002) stated the study of increased weight gain in the

massage therapy in low birth weight infants. The study was conducted in Wolfsan medical center, Israel and they adopted random cluster design. The study comprised 57 healthy low birth weight infants assigned to three groups. One in which the mothers performed the massage and the other in which a professional female. Both these groups were compared to a control group. Over the ten days study period, the two treatment groups gained significantly more weight compared to control group (291.3 and 311.3 Vs 225.5 respectively). The researchers concluded that mothers are able to achieve the same effect size as that of trained professionals.

Agarwal KN, et al.,(2000) the study was undertaken to investigate the effects of massage and use of oil on growth in infants. Full term born healthy infants (n = 125), birth weight <3000 grams were randomly divided into 5 groups. Infants received herbal oil, sesame oil, mustard oil, mineral oil and no massage group served as a control. The result shows that massage improved the weight as compared to infants without oil massage. Massage in infancy improves the growth, sesame oil showed significant benefit than the other type of oil groups.

Vickers A, et al.,(2000) a randomized trial to determine the effects of preterm / low birth weight infants exposed to massage experience improved weight gain. Randomized trials in which infants with birth weight of < 2500 grams received systematic tactile stimulation by human hands. Massage intervention improved daily weight gain by five grams (95% CI 3.5g, 6.5 g). Evidence that infant massage has improved weight gain in preterm/ low birth weight infants.

SECTION - C

STUDIES RELATED TO COCONUT OIL MASSAGE ON WEIGHT GAIN

Saeedi R, et al., (2011) conducted a study to evaluate the effect of massage with coconut oil on weight gain in pre term newborn. Quasi experimental design was adopted for this study. Seventy five newborns were randomly assigned to three groups. A (massage with coconut oil), B (massage only) and C (control group). The weight of the newborns in all three groups were measured daily by a nurse who was blinded to the study. The result shown that there was a significant difference between the weight gain in the three groups after the intervention. The mean values of the three groups were 240.2, 224.4 and 212.4 grams. The researcher concluded that massage with coconut oil has a positive effect on weight gain in pre term newborns.

Sushma Nangia, et al., (2010) conducted a study to determine the efficacy of topical coconut oil application in reducing transepidermal water loss in pre term very low birth weight newborns. Seventy four pre term VLBW infants were randomly assigned at 12 hrs of age to either 4ml of topical coconut oil application every 12 hrs for seven days (n=37) or no oil application (n=37). The results shown the TEWL was significantly lower in the infants in the coconut oil group at each point of measurement. An advanced form of mean difference is 6.8 per hour during first week of life $p=.000$. The researcher concluded that coconut oil application in pre term VLBW newborns reduced TEWL by as much as 46% and it reduces initial weight loss and promote better growth.

Javadifar N, et al.,(2008) stated in a study that the effectiveness of massage with coconut oil on weight gain of low birth weight newborns. The study is a clinical trial which was carried out on 72 healthy low birth weight neonates. The sampling

was done randomly based on the purpose of the study. Neonates were divided in to three equal groups (24 in each): control, massage and massage with coconut oil. In massage group massaging was done three times a day and each session lasted for five minutes based on the techniques started from the day 3 to 17 after birth. In oil massage group the same technique was done with 10ml per kg coconut oil for the same period. In control group there was no interventions. There was a significant difference in average weight gain seven days after intervention in massage with oil (2525.42 grams) to control group (2267.29 grams). This study showed that massage with coconut oil is an effective and valuable method in weight gain in low birth weight neonates.

Solanki K, et al., (2005) a short term randomized controlled study conducted in tertiary care Neonatal Intensive Care Unit (NICU) of a large teaching hospital and a research laboratory of a university to assess the transcutaneous absorption of traditionally massaged oil in newborns and to specifically compare the effects of essential fatty acid rich safflower oil, saturated fat rich coconut oil. One hundred and twenty study subjects were randomly assigned in to three groups like safflower oil (n= 40), coconut oil (n=40) and no oil controls (n=40). Five ml of the designated oil was massaged four times a day for five days under controlled conditions of temperature and feeding. Pre and post oil massage samples of blood were analyzed for triglycerides and fatty acid profiles using gas chromatography. Post oil triglycerides values were significantly raised in both the oil groups than the no oil control group. This study shows that topically applied oil can be absorbed in neonates and is probably available for nutritional purposes.

Arora J, et al.,(2005) stated the study about the effect of coconut oil massage

on growth in low birth weight infants. The study was conducted in tertiary level neonatal unit of a teaching hospital. The subjects were infants with birth weight of less than 2500 grams. The design adopted for this study was randomized controlled trial. Eligible neonates were randomized to one of the three groups such as massage with coconut oil, massage without oil and no massage. Weight, length, head circumference and triceps skin fold thickness were measured in three groups at regular intervals. Serum triglycerides levels were measured at enrolment and at completion. The results shown that weight gain in the coconut oil massage group (365.8 +/- 165.2 gram) was higher compared to the only massage group (290.0 +/- 150.2 gram) and no massage group (285.0 +/- 170.4 gram). The researcher concluded that coconut oil massage has a potential to improve weight gain among low birth weight infants.

SankaranarayananK, et al.,(2005) conducted a study that he has to compare the effect of massage with coconut oil versus mineral oil and placebo on growth velocity in well term and pre term babies. This study was conducted in premature unit and post natal ward of a teaching hospital in a metropolitan city. Babies in each group were randomized to receive massage with either coconut oil mineral oil or placebo. Oil massage was given by a trained person from the day two of life to 31 days of life. Babies were followed up daily. The result shown that coconut oil massage resulted insignificantly greater weight gain velocity as compared to mineral oil and placebo.

Ferber (2002) in his extensive study, he has to the effectiveness of coconut oil massage on weight gain in preterm newborns. The study was conducted from the Touch Research Institute. The researcher found that over a ten days study period, the pre-term infants who received coconut oil massage (gained 311.3 g) gained

significantly more weight when compared to the control group (gained 225.5 g). The researcher concluded that coconut oil massage has a potential to improve weight gain in preterm neonates.

Darmstadt GL&Saha SK (2002) this study was undertaken to gain weight in to the practice and perception regarding traditional oil massage of Bangladeshi neonates. A questionnaire was administered verbally to the primary care taker of 352 outpatients at the DhakaShishuHospital. More than 96 percent (340/352) of the caregivers practiced coconut oil massage irrespective of socio economic status and place of residence. They applied coconut oil massage over the entire body one to three times daily in both term and preterm low birth weight neonates. The researcher concluded that the coconut oil massage improves weight gain (96%) among the Bangladeshi neonates.

CHAPTER – III

RESEARCH METHODOLOGY

Research methodology refers to the techniques used to structure a study and to gather and analyze information in a systematic fashion (**Polit&Hungler, 2008**).

Methodology includes the steps, procedures and strategies for gathering and analyzing the data in the research investigation.

This chapter consists of research design, variables in the study, setting of the study, population, sample size, sampling technique, criteria for selection of sample, development and description of tool, scoring key, intervention, content validity, reliability, pilot study, data collection procedure and plan for data analysis.

RESEARCH APPROACH

Quantitative research approach was adopted for this study.

RESEARCH DESIGN

Research design adopted for this study was quasi experimental pre test and post test control group design. It can be diagrammatically represented as

Group	Pre test	Intervention	Post test
Experimental	O ₁	X	O ₂
Control	O ₁	-	O ₂

Fig: 2 Schematic Representation of Research Design

Key:

O₁ .pre test of experimental group.

O₂.Post test of experimental group.

X - Intervention (coconut oil massage).

- - No intervention.

O₁.Pre test of control group.

O₂.Post test of control group.

VARIABLES

Independent Variable

Oil massage

Dependent Variable

Weight gain

SETTING OF THE STUDY

The study was conducted in the Neonatal Intensive Care Unit(NICU) and post natal ward of James Multispeciality Hospital at Kanyakumari District, which is certified for ISO-9002. This hospital is located at 1km far from Colachel. It is a 150 bedded Multispeciality hospital with 24 hours emergency care, in that the NICU has fifteen beds and the post natal ward has twenty beds. The census of the NICU is around ten to twelve per week and the census of the post natal ward is around eight to ten per week. The setting was chosen on the basis of feasibility, availability of adequate sample and the familiarity of the investigator with the setting.

POPULATION

Newborns with the birth weight between 2000 to 2500gms who were admitted in the NICU and post natal ward.

SAMPLE

Newborns with the Birth weight between 2000 to 2500grams who were

admitted in James Multispeciality Hospital at Kanyakumari District, those who fulfilled the inclusive criteria of the study.

SAMPLE SIZE

Total sample size was sixty newborns. Among thirty newborns in experimental group and remaining thirty newborns in control group.

SAMPLING TECHNIQUE

The samples were selected by using of convenient sampling technique. Based on the researcher convenience and considering the inclusive criteria, approximately eighteen low birth weight newborns per week were selected by the researcher. As per the researcher convenience, among eighteen low birth weight newborns, nine were selected for experimental group and the other nine were kept as control group.

CRITERIA FOR SAMPLE SELECTION

Inclusive Criteria

1. Newborns of age group between 8 to 15days.
2. Mothers who is willing to participate in this study.
3. Newborns with moderate low birth weight of 2000 to 2500grams.
4. Both males and females.

Exclusive Criteria

1. Newborn who has skin infection.
2. Newborn who are under ventilator support.
3. Newborns with medical and surgical condition.

DEVELOPMENT AND DESCRIPTION OF TOOL

Section-A

Background Data of Mother

Questionnaire to collect demographic data of the samples which consists of five items. They were age of the mother, type of family, income of the family, mode of delivery and weight gain by the mother during pregnancy.

Section-B

Background Data of Newborn

Questionnaire to collect demographic data of the samples which consists of five items. They were age of the newborn, sex of the newborn, birth weight of the newborn, gestational age and type of feeding.

Section-C

The weight gain is assessed by Electronic infant weighing scale. Electronic infant weighing scale especially adapted for use as a pediatric or infant scale having a mechanical leverage weighing structure with a high degree of sensitivity and low friction and hysteresis coupled with a compatible electronic measuring system and a digital read-out system is provided. This electronic weighing scale is invented by **Tushmut** and **WalterP**. The weighing scale used by the investigator was calibrated on 15-01-2011.

SCORING KEY

The average weight gain for the term baby is 20 to 30gms/day.

By giving coconut oil massage there is an additional weight gain of nine to eleven gms/day.

Very poor	-	<145gms/5 days
Poor	-	146-165gms/5 days
Average	-	166-185gms/5 days

Good	-	186-205gms/5 days
Very good	-	>206gms/5 days

INTERVENTION

The procedure was, on the first day the investigator checked the weight of the newborns in both experimental and control group. A conducive environment was established before initiation of coconut oil massage. Massage was given ideally 45 minutes to one hour after a feed to avoid regurgitation or vomiting. Twenty milliliter of coconut oil was applied and massaged the entire body of the newborns starting from head, neck, chest, abdomen, back and extremities with the finger pad twice daily for 15 minutes to the experimental group for five days. The control group was not received the coconut oil massage. On the sixth day the weight was assessed by electronic infant weighing scale for both experimental and control group.

CONTENT VALIDITY

Validity refers to the degree to which an instrument measures what it is supposed to measure. The content of the tool was established on the basis of opinion of one medical expert and five nursing experts in the field of pediatrics.

RELIABILITY OF THE TOOL

Hence the tool was standardized electronic infant weighing scale and universally acceptable one. The weighing scale used by the investigator was calibrated on 15-01-2011. Thus the researcher did not check the reliability.

PILOT STUDY

It is the rehearsal for the main study. The researcher got permission from principal and research ethical committee of Sri. K .Ramachandran Naidu College of

Nursing and HOD of pediatric nursing. A formal permission was obtained from the director of the C.S.I. Medical Mission Hospital, Neyyoor. The pilot study was conducted in NICU for the period of one week (28/03/2011 to 03/04/2011) from 9 am to 6 pm. The concerned wards in charge and duty doctors were also informed and their co-operation was also obtained. The sample size was six newborns and they were selected by using convenient sampling technique, in that three of them allotted for experimental group and three of them to control group.

Rapport was established with the mothers and a brief introduction about the study was given. Consent was obtained from each mother and reassurance was provided that the collected data would be kept confidential. The data related to demographic variables were collected from the mothers by interview method and also from the medical records. The procedure was, on the first day the investigator checked the weight of the newborns in both experimental and control group. Twenty milliliter of coconut oil was applied and massaged the entire body of the newborns starting from head, neck, chest, abdomen, back and extremities with the finger pad twice daily for 15 minutes to the experimental group for five days. The control group was not received the coconut oil massage. On the sixth day the weight was assessed by electronic infant weighing scale for both experimental and control group. The results of the pilot study showed that the experimental group had a good weight gain as compared to the control group. The study was found to be feasible and hence the same procedure was decided to be followed in the main study. There was no modification made in the tool after pilot study.

PROCEDURE FOR DATA COLLECTION

The researcher got permission from principal and research ethical committee of Sri. K .Ramachandran Naidu College of Nursing and HOD of pediatric nursing. A

formal permission was obtained from the director of the James Multispeciality Hospital, Colachel at Kanyakumari District for conducting main study.

The data were collected from 04/04/2011 to 30/04/2011, between 8 am to 4 pm, six days in a week. Newborns with low birth weight were selected by using convenient sampling method according to the inclusive criteria after obtaining the consent from the mother of the newborns. The procedure was, on the first day the investigator checked the weight of the newborns in both experimental and control group. A conducive environment was established. Twenty milliliter of coconut oil was applied and massaged the entire body of the newborns starting from head, neck, chest, abdomen, back and extremities with the finger pads twice daily for 15 minutes to the experimental group for five days. The control group was not received the coconut oil massage. On the sixth day the weight was assessed by electronic infant weighing scale for both experimental and control group. The data were collected approximately two to three study subjects per day.

PLAN FOR DATA ANALYSIS

The data were analyzed by using descriptive and inferential statistics.

Descriptive Statistics

1. Frequency and percentage distribution were used to analyze the demographic data.
2. Mean and standard deviation were used to assess the effectiveness of coconut oil massage on weight gain among low birth weight newborns.

Inferential Statistics

1. Unpaired and paired 't' test was used to compare the pre test and post test level of effectiveness of coconut oil massage on weight gain among experimental

and control group.

2. Chi- square test was used to find out the association of the effectiveness of coconut oil massage on weight gain among low birth weight newborns with their selected demographic variables of experimental and control group.

PROTECTION OF HUMAN RIGHTS

The researcher got permission from principal and research ethical committee of Sri. K .Ramachandran Naidu College of Nursing and HOD of pediatric nursing. A formal permission was obtained from the director of the James Multispeciality Hospital, Colachel at Kanyakumari District for conducting main study. Rapport was established with the mothers and a brief introduction about the study was given. Consent was obtained from each mother and reassurance was provided that the collected data would be kept confidential. Throughout the data collection period the study subjects had no adverse effects because of the intervention done by the researcher.

CHAPTER- IV

DATA ANALYSIS AND INTERPRETATION

Data analysis is the systematic organization and synthesis of research data, and the testing of research hypothesis using those data (**Polit&Hungler, 2003**).

This chapter deals with the analysis and interpretation of collected data from 60 newborns to assess the effectiveness of coconut oil massage on weight gain among low birth weight newborns in James MultispecialityHospital, Colachel.

ORGANIZATION OF DATA

The data has been tabulated and organized as follows:

Section – A : Analysis of demographic data of mothers in experimental and control group.

- Frequency and percentage distribution of demographic variables of mothers.

Section – B : Analysis of demographic data of newborns in experimental and control group.

- Frequency and percentage distribution of demographic variables of newborns

Section – C : Frequency and percentage distribution of pre test and post test level of baby weight and weight gain after coconut oil massage among experimental and control group.

- Frequency and percentage distribution of pre test level of baby weight among experimental and control group
- Frequency and percentage distribution of post test level of weight gain after coconut oil massage in both

experimental and control group.

Section – D : Comparison of pre and post test level of weight among experimental and control group.

- Comparison of post test level of weight gain among experimental and control group.
- Comparison of pre test and post test level of baby weight among experimental group.
- Comparison of pre test and post test level of baby weight among control group.

Section – E : Association of post test level of weight gain among newborns in experimental and control group with their selected demographic variables.

- Association of weight gain of the experimental group with demographic variables of the mother.
- Association between demographic variables of newborn and weight gain in experimental group.
- Association between demographic variables of mother and weight gain in control group.
- Association between demographic variables of newborn and weight gain in control group.

SECTION - A

**ANALYSIS OF DEMOGRAPHIC DATA OF MOTHERS IN
EXPERIMENTAL AND CONTROL GROUP**

Table-1: Frequency and Percentage Distribution of Demographic Variables of Mothers (N=60)

S. No.	Demographic Variables	Experimental Group		Control Group	
		f	%	f	%
1.	Age				
	15 – 25 years	14	46.6	19	63.3
	26 – 35 years	16	53.3	11	36.6
2.	Type of Family				
	Nuclear	13	56.6	18	40
	Joint	17	23.3	9	60
3.	Family Income				
	< Rs.6,000	7	23.3	9	60
	> Rs.6,000	23	76.6	21	30
4.	Mode of Delivery				
	Vaginal	9	30	10	33.3
	LSCS	21	70	20	66.6
5.	Weight Gain During Pregnancy				
	1 – 6kg	0	0	1	3.3
	7 – 12kg	30	100	29	96.6

Table 1 depicts the frequency and percentage distribution of demographic variables of mothers.

With regard to maternal age, the mothers 14 (746.6%) were between the age group of fifteen to twenty five years and 16 (53.3%) were between the age group of twenty six to thirty five years in the experimental group, whereas 19 (63.3%) were between the age group of fifteen to twenty five years and 11 (36.6%) were between the age group of twenty six to thirty five years in the control group.

With regard to type of family, 13 (43.3%) mothers were nuclear family and 17 (56.6%) mothers were joint family in the experimental group where as 12 (40%) mothers were nuclear family and 18 (60%) mothers were joint family in the control group.

With respect to family income, the majority of the mothers 23 (76.6%) has more than six thousand rupees per month and 7 (23.3%) had less than six thousand rupees per month in the experimental group, where as 21 (70%) mothers got more than six thousand rupees per month, and 9 (30%) got less than six thousand rupees per month.

With regard to mode of delivery, 9 (30%) mothers undergone vaginal delivery and majority of mothers 21 (70%) had LSCS in the experimental group, where as 10 (33.3%) mothers had vaginal delivery and 20 (66.6%) mothers had LSCS in the control group.

With respect to weight gain of mothers during pregnancy, no one had less than six kilogram weight gain during pregnancy and 30 (100%) had seven to twelve kilogram weight gain during pregnancy in experimental group, where as 1 (3.3%) had less than six kilograms weight gain during pregnancy and 29 (96.6%) had seven to twelve kilogram weight gain during pregnancy in control group.

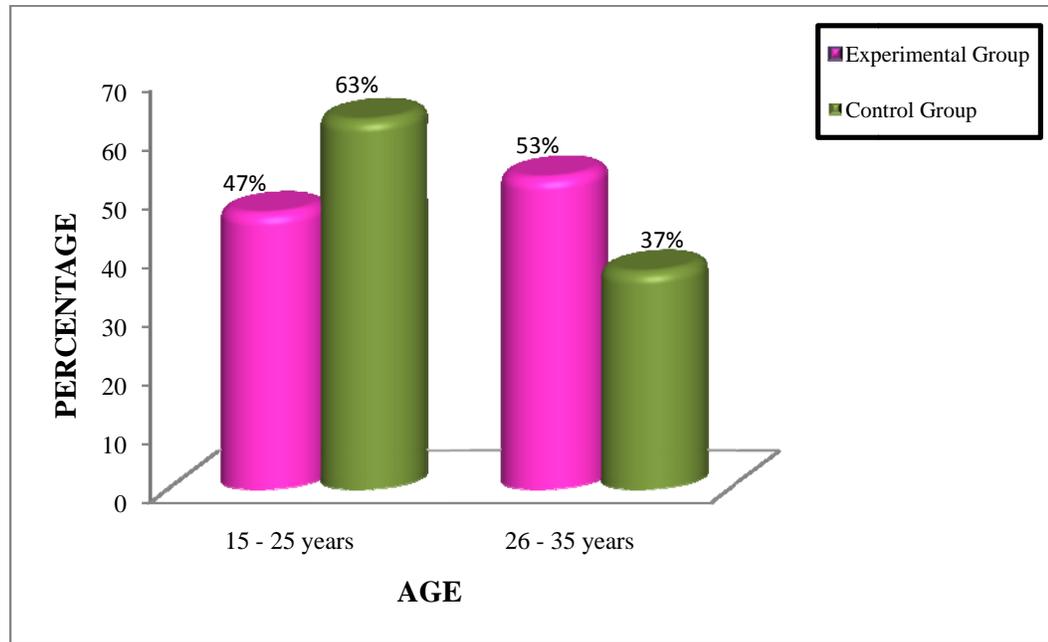


Figure 4: Percentage distribution of demographic variable of age of the mother in experimental and control group.

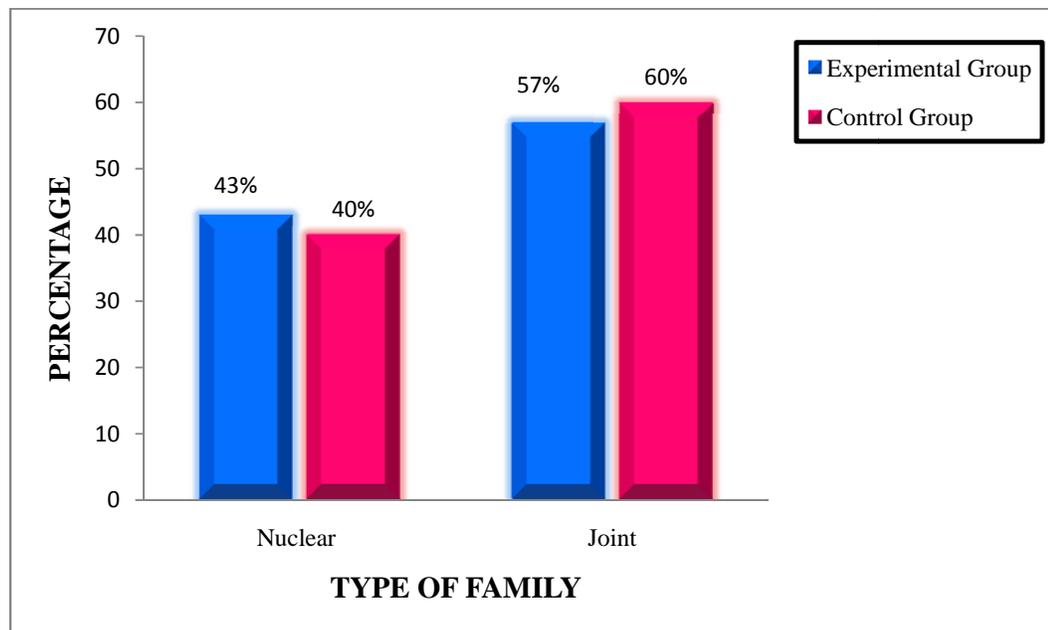


Figure 5: Percentage distribution of demographic variable of type of family in experimental and control group.

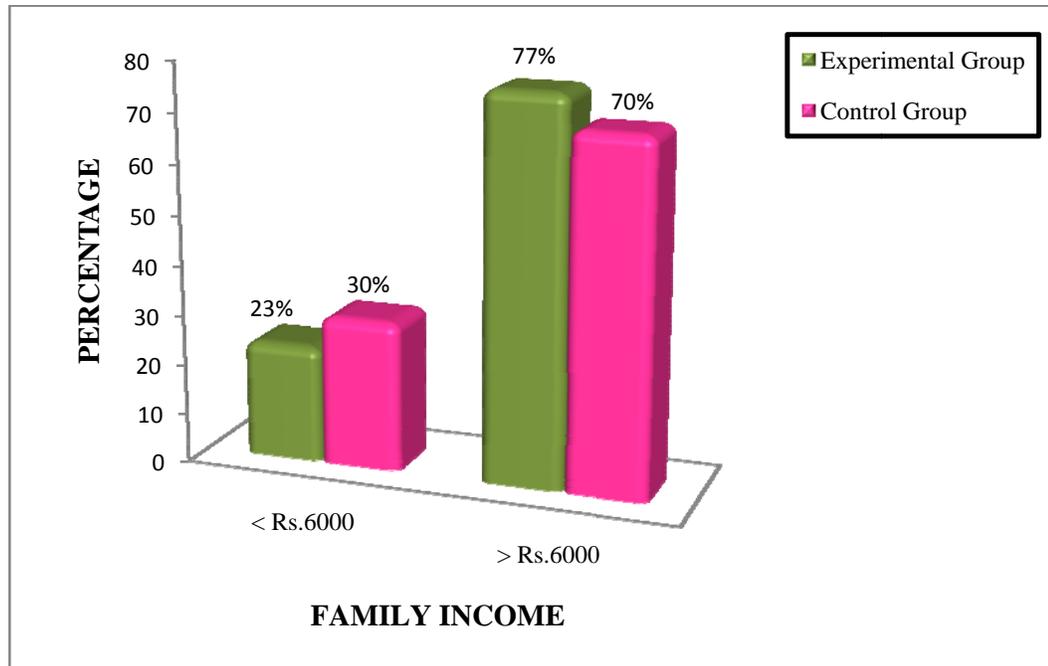


Figure 6: Percentage distribution of demographic variable of family income in experimental and control group.

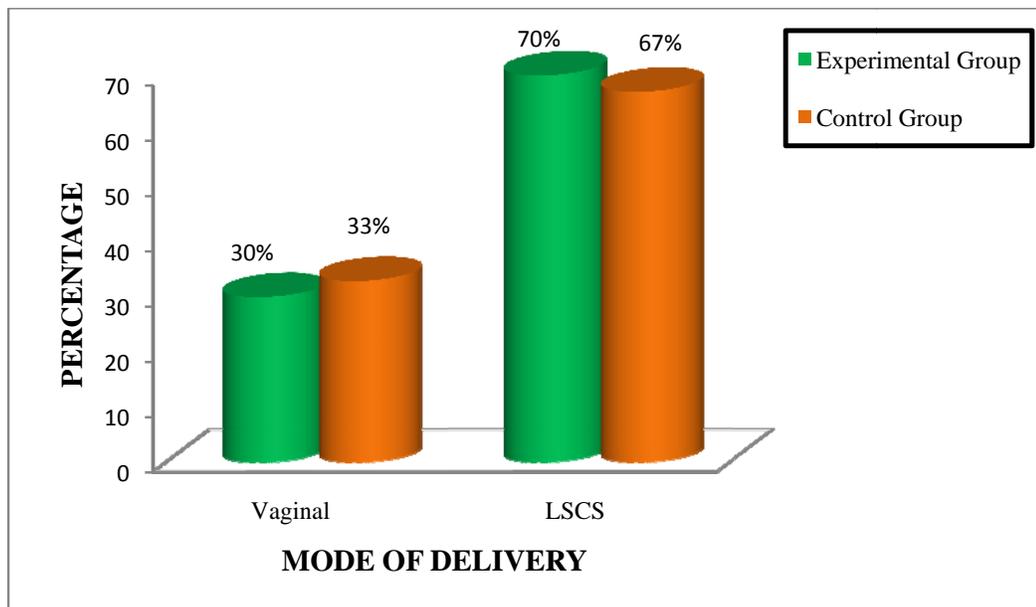


Figure 7: Percentage distribution of demographic variable of mode of delivery in experimental and control group.

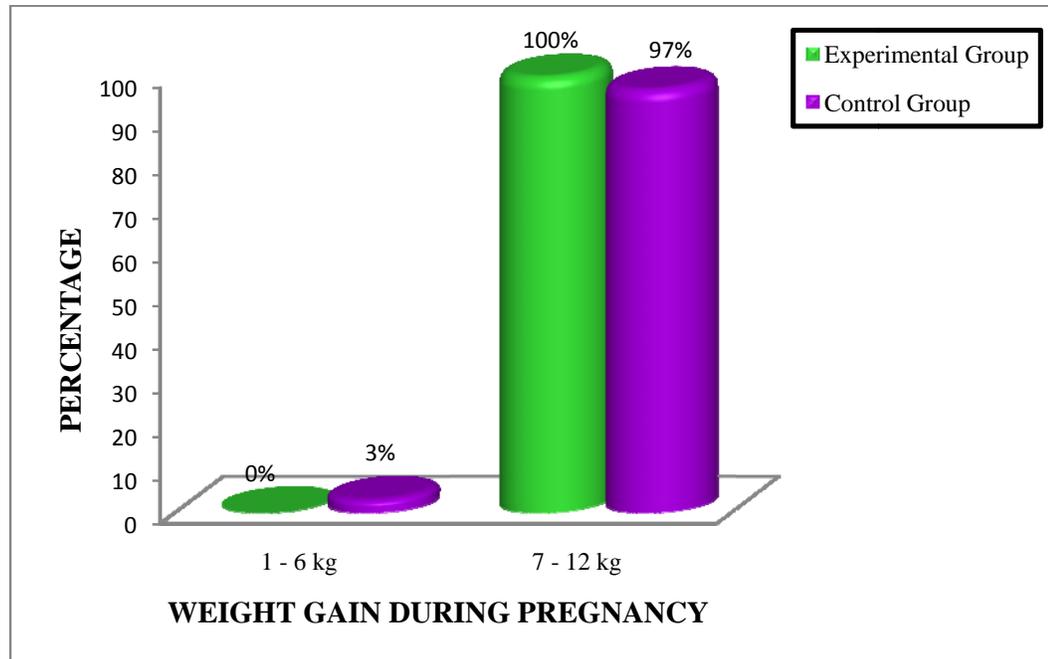


Figure 8: Percentage distribution of demographic variable of weight gain during pregnancy in experimental and control group.

SECTION - B

ANALYSIS OF DEMOGRAPHIC DATA OF NEWBORNS IN EXPERIMENTAL AND CONTROL GROUP

**Table-2: Frequency and Percentage Distribution of Demographic Variables of
Newborns (N=60)**

S. No.	Demographic Variables	Experimental Group		Control Group	
		f	%	f	%
1.	Age				
	8 – 11 days	27	90	26	86.6
	12 – 15days	3	10	4	13.3
2.	Sex				
	Male	12	40	12	40
	Female	18	60	18	60
3.	Birth Weight				
	2000 – 2250 gms	16	53.3	19	63.3
	2251 – 2500 gms	14	46.6	11	36.6
4.	Gestational Age				
	37 – 38 weeks	17	56.6	22	73.3
	39 – 40 weeks	13	43.3	8	26.6
5.	Type of Feeding				
	Breast feeding	26	86.6	26	86.6
	Expressed breast feeding	4	13.3	4	13.3

Table 2 depicts that the frequency and percentage distribution of demographic variables of newborns.

With regard to neonatal age, majority of newborns 27(90%) were between the age group of eight to eleven days and 3 (10%) were between the age group of twelve to fifteen days in experimental group, whereas 26 (86.6%) were between the

age group of eight to eleven days and 4 (13.3%) was between the age group of twelve to fifteen days in control group.

With respect to sex classification, 12 (40%) newborns were males and 18 (60%) newborns were females in experimental group, whereas 12 (40%) newborns were males and 18 (60%) newborns were females in control group.

With regard to birth weight, 16 (53.3%) newborns had birth weight of two thousand to two thousand and two hundred fifty grams and 14 (46.6%) had two thousand and two hundred fifty one grams to two thousand five hundred grams of birth weight in experimental group, whereas most of the newborns 19 (63.3%) had birth weight of two thousand to two thousand and two hundred fifty grams and 11 (36.6%) had two thousand and two hundred fifty one grams to two thousand five hundred grams of birth weight in control group.

With respect to gestational age, 17 (56.6%) newborns were born on thirty seven to thirty eight weeks and 13 (43.3%) newborns were born on thirty nine to forty weeks in experimental group, whereas majority of newborns 22 (73.3%) were born on thirty seven to thirty eight weeks and 8 (26.6%) newborns were born on thirty nine to forty weeks in control group.

With regard to type of feeding, most of the newborns 26 (86.6%) had breast feeding and 4 (13.3%) had expressed breast feeding in experimental group, whereas 26 (86.6%) had breast feeding and 4 (13.3%) had expressed breast feeding in control group.

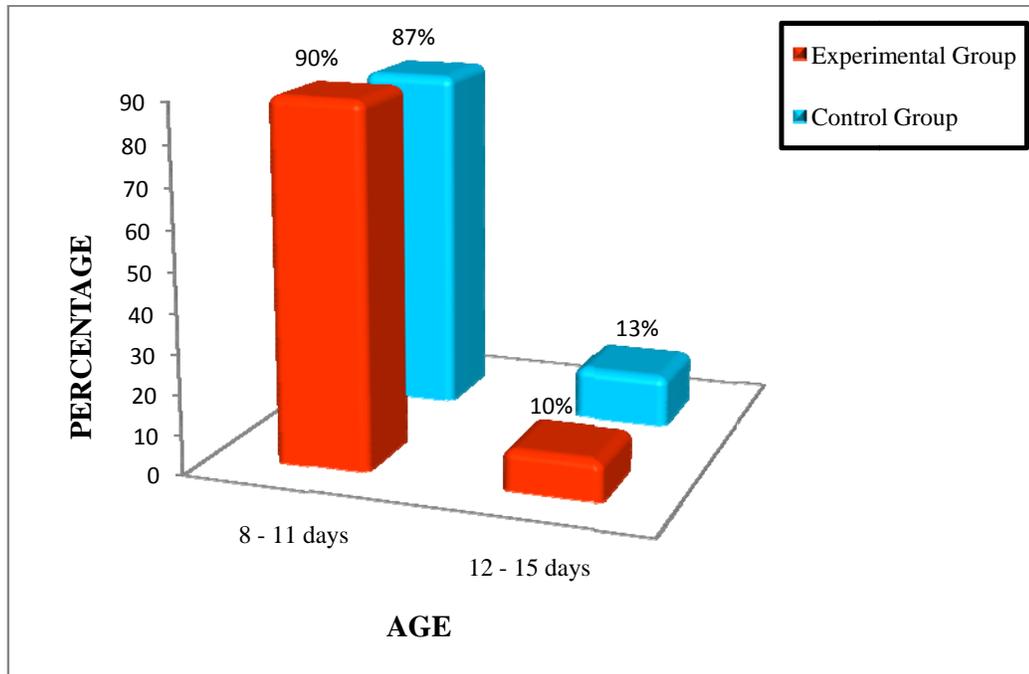


Figure 9: Percentage distribution of demographic variable of age of the newborns in experimental and control group.

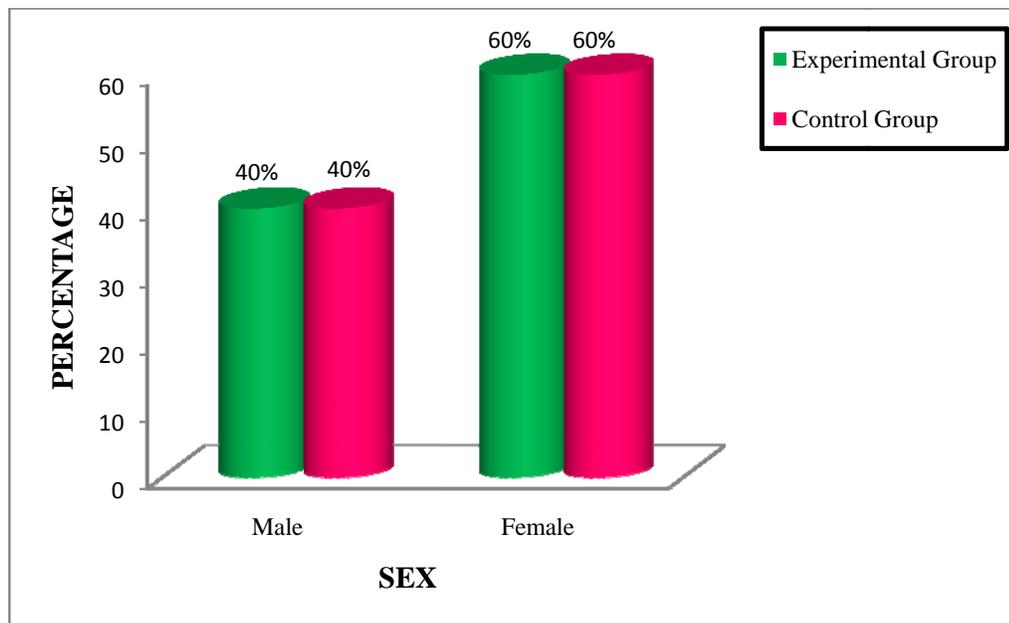


Figure 10: Percentage distribution of demographic variable of sex of the newborns in experimental and control group.

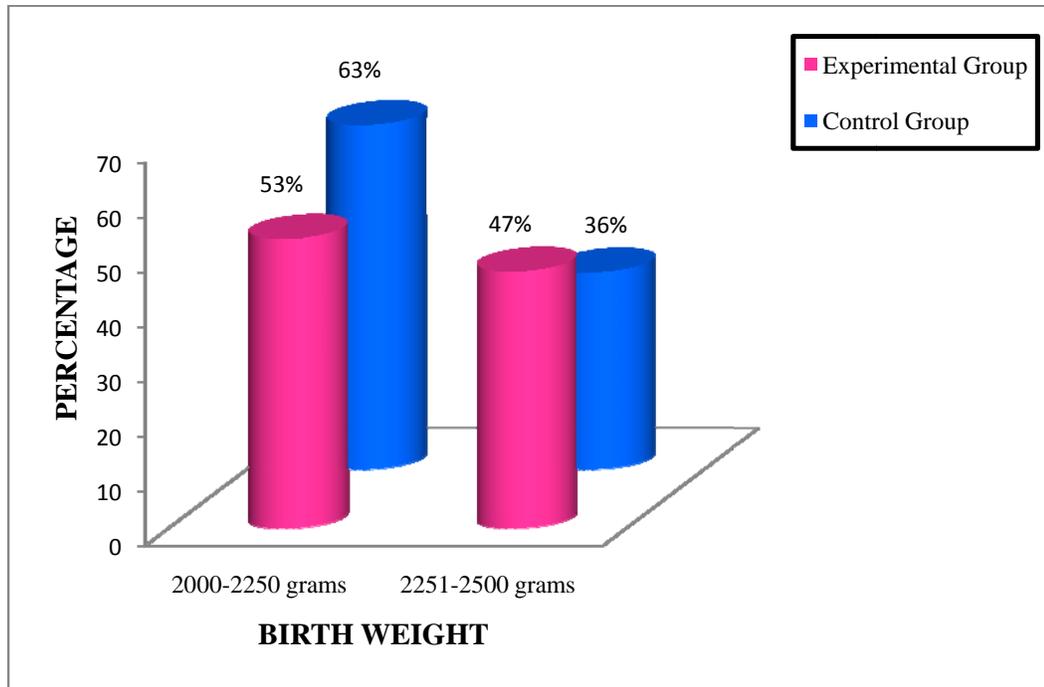


Figure 11: Percentage distribution of demographic variable of birth weight of the newborns in experimental and control group.

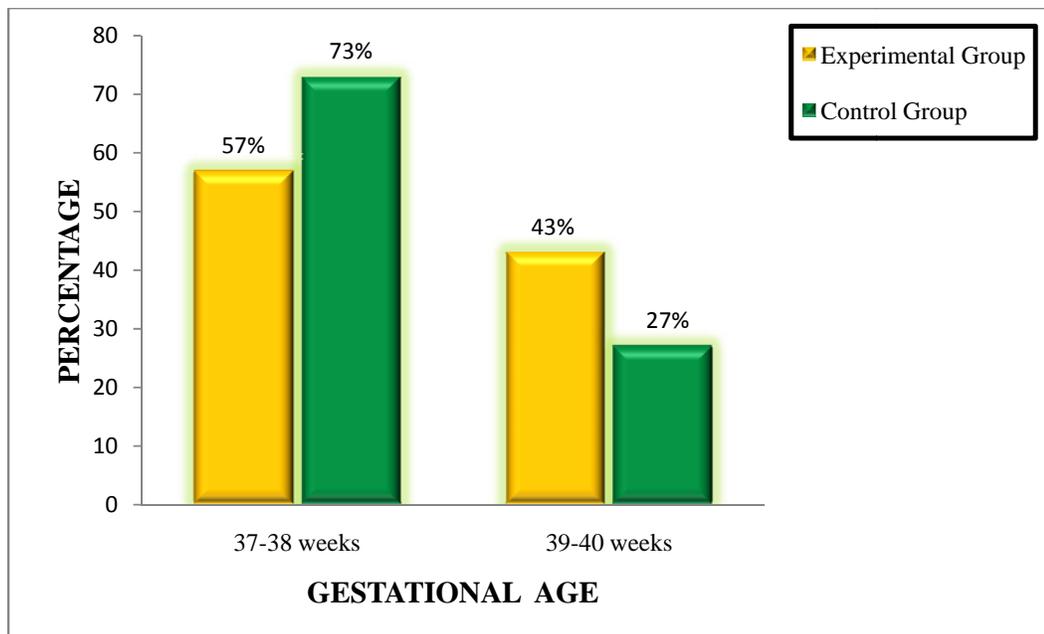


Figure 12: Percentage distribution of demographic variable of gestational age of the newborns in experimental and control group.

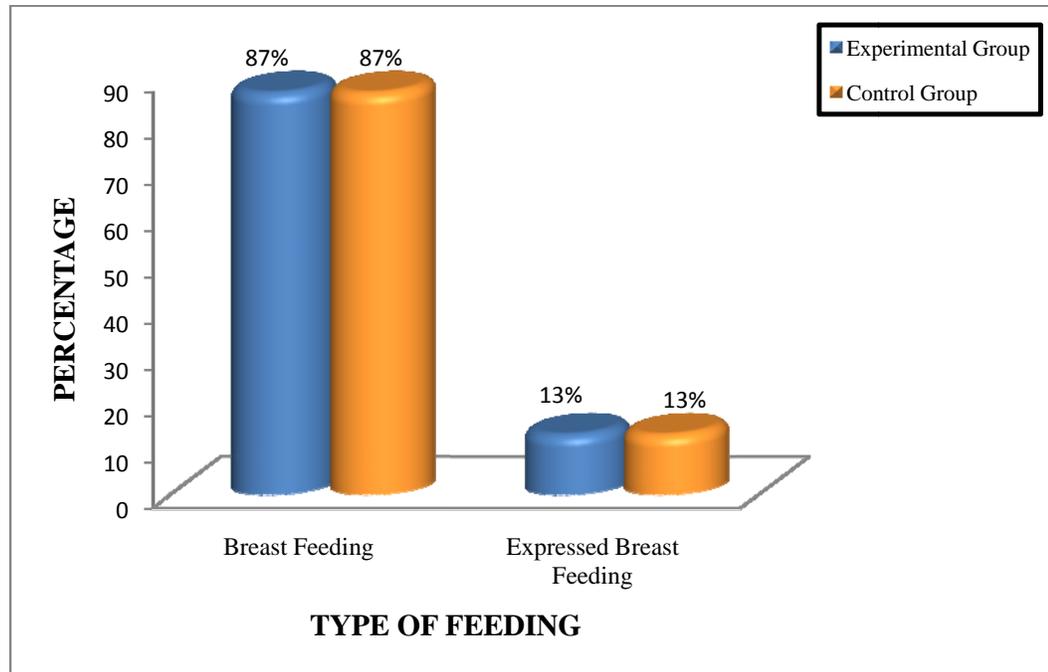


Figure 13: Percentage distribution of demographic variable of newborns type of feeding in experimental and control group.

SECTION - C

FREQUENCY AND PERCENTAGE DISTRIBUTION OF PRE TEST AND POST TEST LEVEL OF BABY WEIGHT AMONG EXPERIMENTAL AND CONTROL GROUP

Table-3: Frequency and Percentage Distribution of Pre test Level of Baby Weight among Experimental and Control Group

(N=60)

Category	Experimental Group		Control Group	
	Pre test		Pre test	
	f	%	f	%
2000 – 2250 grams	16	53.33	19	63.33
2251 – 2500 grams	14	46.66	11	36.66

With regard to pre test level of baby weight among experimental group, 16 (53.33%) of newborns were under the weight of 2000 – 2250 grams and 14 (46.66%) of newborns were under the weight of 2251 – 2500 grams.

With regard to pre test level of baby weight in the control group, 19 (63.33%) of newborns were under the weight of 2000 – 2250 grams and 11 (36.66%) of newborns were under the weight of 2251 – 2500 grams.

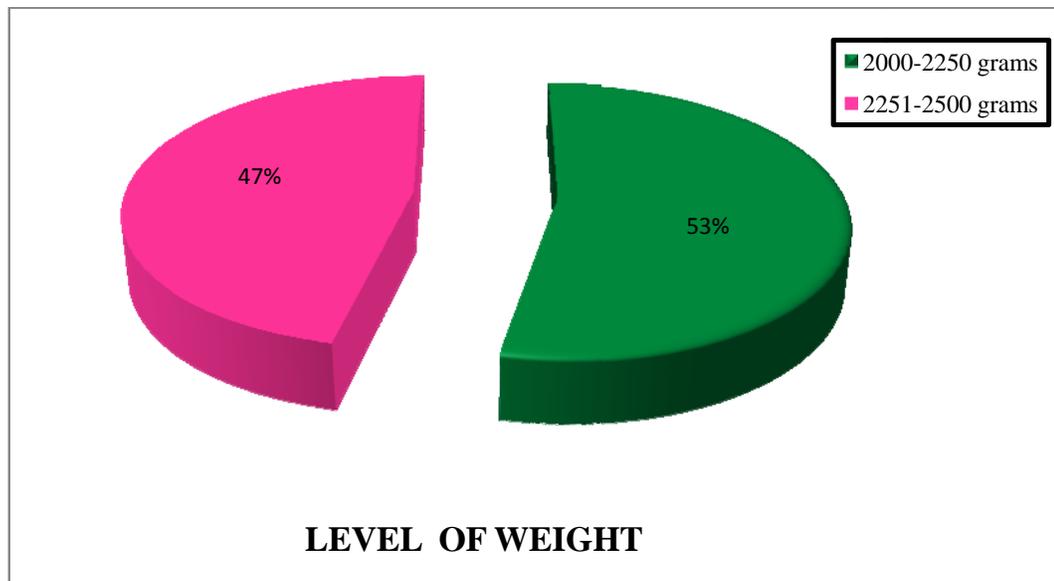


Figure 14: Frequency and percentage distribution of pre test level of baby weight among experimental group.

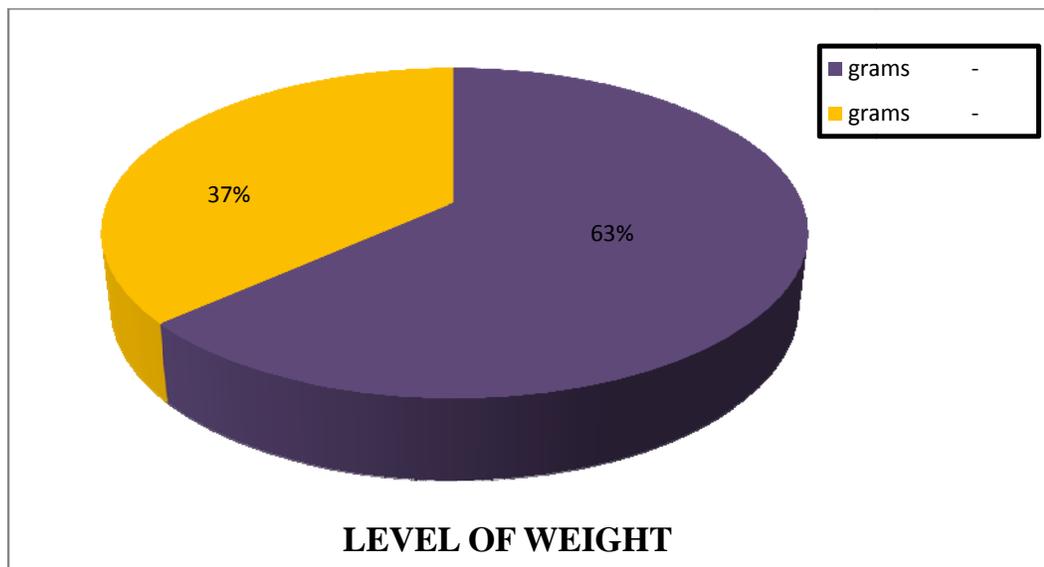


Figure 15: Frequency and percentage distribution of pre test level of baby weight among control group.

Table – 4 Frequency and Percentage Distribution of Post test Level of Weight Gain after Coconut Oil Massage in Both Experimental and Control Group.

(N=60)

S. No	Weight gain	Experimental Group		Control Group	
		f	%	f	%
1.	Very poor	-	-	3	10
2.	Poor	-	-	23	76.6
3.	Average	-	-	4	13.3
4.	Good	15	50	-	-
5.	Very good	15	50	-	-

Table 4 depicts that the post test level of weight gain in both experimental and control group. Fifteen (5%) newborns were had good weight gain, and also 15 (50%) newborns had very good weight gain and no one was comes under the category of very poor, poor and average in experimental group, whereas newborns 3(10%) were falls on very poor weight gain, 23(76.6%) had poor weight gain, 4(13.3%) newborns had average weight gain and no one had good and very good weight gain.

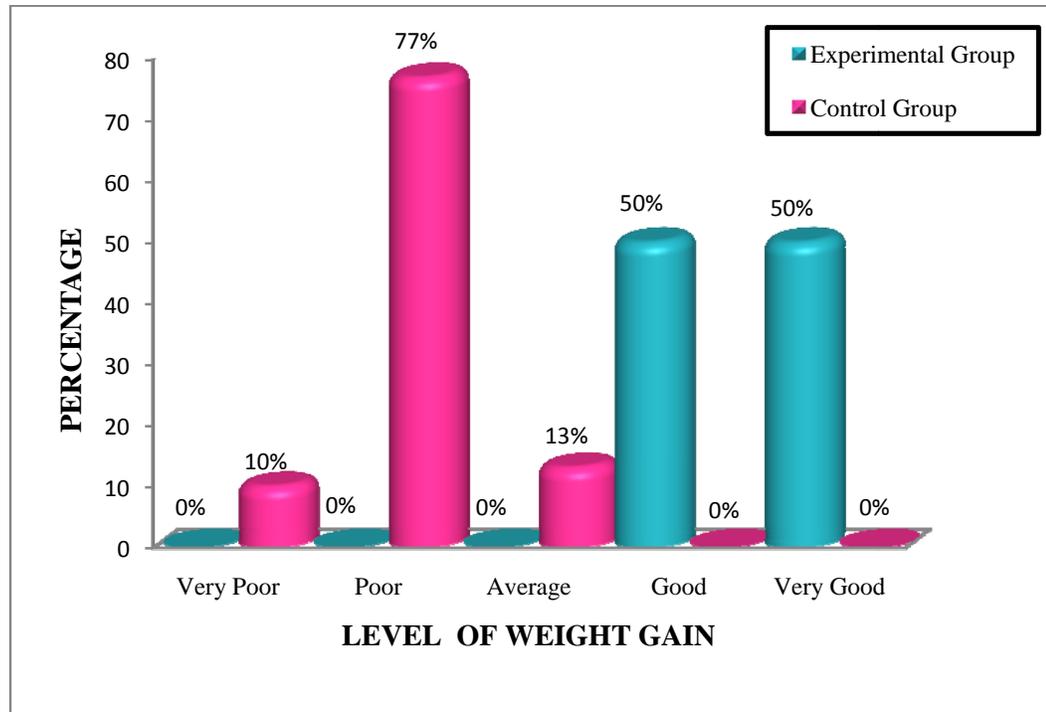


Figure 16: Percentage distribution of post test level of weight gain in both experimental and control group.

SECTION - D

COMPARISON OF PRE TEST AND POST TEST LEVEL OF WEIGHT AMONG EXPERIMENTAL AND CONTROL GROUP

Table – 5 Comparison of post test level of weight gain among experimental and control group (N =60)

Groups	Mean	SD	't' value
Experimental group	2.51	0.17	10.25 S
Control group	2.34	0.22	

S:Significant

Table 5 reveals the comparison of the post test level of weight gain among experimental and control group.

With regard to the experimental group the post test mean value was 2.51 with standard deviation of 0.17. In control group the mean value was 2.34 with standard deviation of 0.22. The calculated 't' value was 10.25 indicating that there was significant difference in post test level of weight gain among experimental and control group at $p < 0.05$ level.

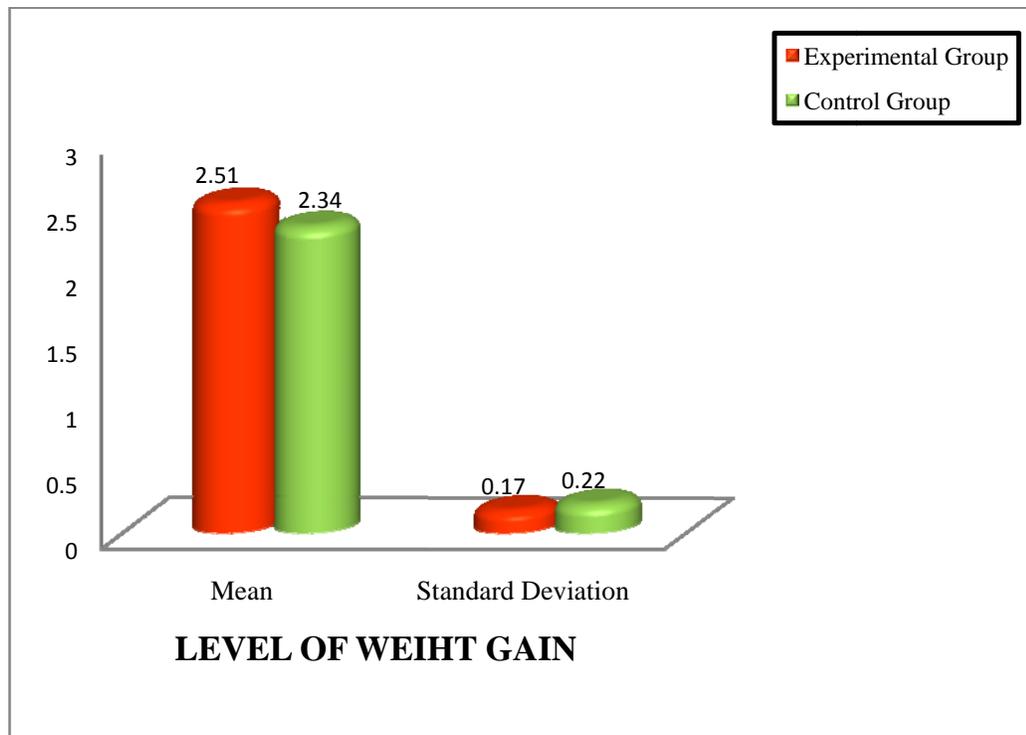


Figure 17: Comparison of post test level of weight gain among experimental and control group.

Table - 6 Comparison of Pre test and Post test Level of Baby Weight among Experimental Group

(N=30)

Experimental group	Mean	S.D	M.D	't' value
Pre test	2.24	0.14	0.27	27.09 S
Post test	2.51	0.17		

S: Significant

Table - 6 reveals the comparison of pre and post test level of baby weight among experimental group.

The pre test mean value was 2.24 with standard deviation of 0.14. The post test mean value was 2.51 with standard deviation of 0.17. The mean difference is 0.27. The calculated 't' value was 27.09 indicating that there was significant difference in pre and posttest level of baby weight among experimental group at $p < 0.05$ level.

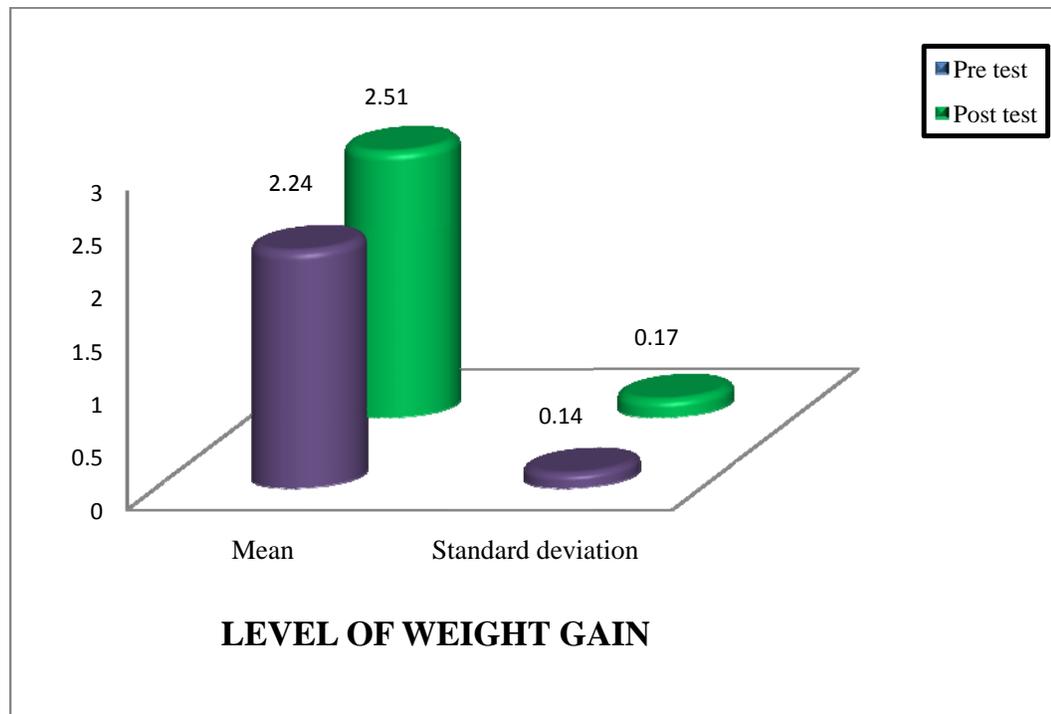


Figure 18: Comparison of pre test and post test level of baby weight gain among experimental group.

Table-7 Comparison of Pre test and Post test Level of Baby Weight among Control Group

(N=30)

Control group	Mean	S.D	M.D	't' value
Pre test	2.19	0.17	0.15	16.05 S
Post test	2.34	0.22		

S: Significant

Table 7 shows the comparison of pre and post test level of baby weight among control group.

The pre test mean value was 2.19 with standard deviation of 0.17. The post test mean value was 2.34 with standard deviation of 0.22. The mean difference is 0.15. The calculated 't' value was 16.05 indicating that there was significant difference in pre and post test level of baby weight among control group at $p < 0.05$ level.

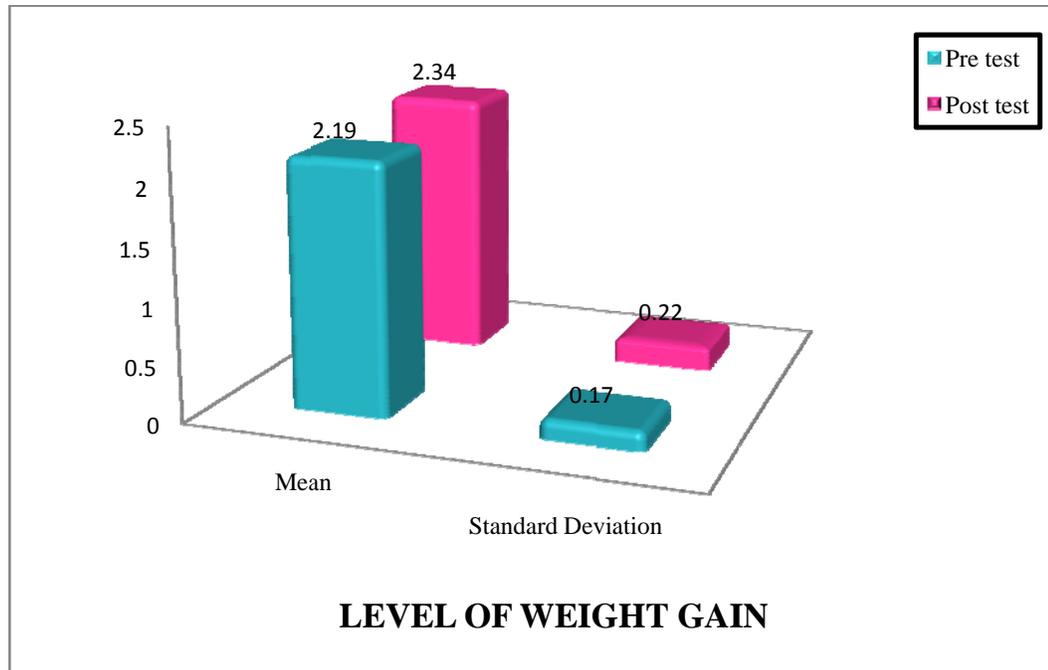


Figure 19: Comparison of pre test and post test level of baby weight gain among control group.

SECTION-E

ASSOCIATION OF POST TEST LEVEL OF WEIGHT GAIN AMONG NEWBORNS IN EXPERIMENTAL AND CONTROL GROUP WITH THEIR SELECTED DEMOGRAPHIC VARIABLES.

Table-8(a): Association of Weight Gain of the Experimental Group with Demographic Variables of the Mother (N=30)

S. No.	Demographic Variables	No.	Very Poor		Poor		Average		Good		Very Good		χ^2 value
			f	%	f	%	f	%	f	%	f	%	
1.	Age												
	15 – 25 years	14	--	--	--	--	--	--	7	23.33	7	23.33	0.587
	26 – 35 years	16	--	--	--	--	--	--	7	23.33	9	30	df=4 NS
2.	Type of Family												
	Nuclear	13	--	--	--	--	--	--	6	20	7	23.33	0.134
	Joint	17	--	--	--	--	--	--	9	30	8	26.66	df=4 NS
3.	Family Income												
	< Rs.6,000	7	--	--	--	--	--	--	3	10	4	13.33	0.184
	> Rs.6,000	23	--	--	--	--	--	--	12	40	11	36.66	df=4 NS
4.	Mode of Delivery												
	Vaginal	9	--	--	--	--	--	--	4	13.33	5	16.66	0.156
	LSCS	21	--	--	--	--	--	--	11	36.66	10	33.33	df=4 NS
5.	Weight Gain During Pregnancy												
	1 – 6kg	0	--	--	--	--	--	--	0	0	0	0	0
	7 – 12kg	30	--	--	--	--	--	--	15	50	15	50	

NS: Non Significant

Chi Square test was carried out to find out association between age of the mother, type of family, family income, mode of delivery, weight gain during pregnancy, and weight gain of experimental group.

In experimental group, the calculated chi –square value was 0.587, 0.134, 0.184, 0.156 respectively which showed that there was no association between demographic variables of the mother and weight gain at $p < 0.05$ level.

Table-8(b): Association between Demographic Variables of Newborn and Weight Gain in Experimental Group

(N =30)

S. No.	Demographic Variables	No.	Very Poor		Poor		Average		Good		Very Good		χ^2 value
			f	%	f	%	f	%	f	%	f	%	
1.	Age												
	8 – 11 days	27	--	--	--	--	--	--	13	43.33	14	46.66	0
	12 – 15 days	3	--	--	--	--	--	--	2	6.66	1	3.33	df=4 NS
2.	Sex												
	Male	12	--	--	--	--	--	--	10	33.33	2	6.66	8.886
	Female	18	--	--	--	--	--	--	5	16.66	13	43.33	df=4 S
3.	Birth Weight												
	2000 – 2250 gms	16	--	--	--	--	--	--	6	20	10	33.33	2.142
	2251 – 2500 gms	14	--	--	--	--	--	--	9	30	5	16.66	df=4 NS
4.	Gestational Age												
	37 – 38 weeks	17	--	--	--	--	--	--	8	26.66	9	30	0.134
	39 – 40 weeks	13	--	--	--	--	--	--	7	23.33	6	20	df=4 NS
5.	Type of Feeding												
	Breast feeding	26	--	--	--	--	--	--	13	43.33	13	43.33	0
	Expressed breast feeding	4	--	--	--	--	--	--	2	6.66	2	6.66	

NS: Non Significant, S: Significant

Chi Square test was carried out to find out association between age of newborn, sex, birth weight, gestational age, type of feeding, and weight gain in experimental group.

In experimental group, the calculated chi –square value was 0, 8.886, 2.142, 0.134, respectively which showed that there was no association between demographic variables of the newborn except sex of the newborn and weight gain at $p < 0.05$ level.

Table-8 (c): Association between demographic variables of mother and weight gain in control group

(N=30)

S. No.	Demographic Variables	No.	Very Poor		Poor		Average		Good		Very Good		χ^2 value
			f	%	f	%	f	%	f	%	f	%	
1.	Age												
	15 – 25 years	19	2	6.66	14	46.66	3	10	--	--	--	--	0.271
	26 – 35 years	11	1	3.33	9	30	1	3.33	--	--	--	--	df=4 NS
2.	Type of Family												
	Nuclear	12	1	3.33	9	30	2	6.66	--	--	--	--	0.191
	Joint	18	2	6.66	14	46.66	2	6.66	--	--	--	--	df=4 NS
3.	Family Income												
	< Rs.6,000	9	0	--	7	23.33	2	6.66	--	--	--	--	0.878
	> Rs.6,000	21	3	10	16	53.33	2	6.66	--	--	--	--	df=4 NS
4.	Mode of Delivery												
	Vaginal	10	1	3.33	8	26.66	1	3.33	--	--	--	--	0.136
	LSCS	20	2	6.66	15	50	3	10	--	--	--	--	df=4 NS
5.	Weight Gain During Pregnancy												
	1 – 6kg	1	0	--	1	3.33	0	--	--	--	--	--	0.087
	7 – 12kg	29	3	10	22	73.33	4	13.33	--	--	--	--	df=4 NS

NS: Non Significant

Chi Square test was carried out to find out association between age of the mother, type of family, family income, mode of delivery, weight gain during pregnancy and weight gain in control group.

In control group, the calculated chi –square value was 0.271, 0.191, 0.878, 0.136, 0.087 respectively which showed that there was no association between demographic variable of mother and weight gain at $p < 0.05$ level.

Table-8 (d): Association between demographic variables of newborn and weight gain in control group.

(N=30)

S. No.	Demographic Variables	No.	Very Poor		Poor		Average		Good		Very Good		χ^2 value
			f	%	f	%	f	%	f	%	f	%	
1.	Age												
	8 – 11 days	26	2	6.66	21	70	3	10	--	--	--	--	2.019
	12 – 15 days	4	1	3.33	2	6.66	1	3.33	--	--	--	--	df=4 NS
2.	Sex												
	Male	12	0	--	11	36.66	1	3.33	--	--	--	--	0.432
	Female	18	3	10	12	40	3	10	--	--	--	--	df=4 NS
3.	Birth Weight												
	2000 – 2250 gms	19	3	10	14	46.66	2	6.66	--	--	--	--	0.348
	2251 – 2500 gms	11	0	--	9	30	2	6.66	--	--	--	--	df=4 NS
4.	Gestational Age												
	37 – 38 weeks	22	3	10	17	56.66	2	6.66	--	--	--	--	1.273
	39 – 40 weeks	8	0	--	6	20	2	6.66	--	--	--	--	df=4 NS
5.	Type of Feeding												
	Breast feeding	26	2	6.66	21	70	3	10	--	--	--	--	0.577
	Expressed breast feeding	4	1	3.33	2	6.66	1	3.33	--	--	--	--	df=4 NS

NS: Non Significant

Chi Square test was carried out to find out association between age of newborn, sex, birth weight, gestational age, type of feeding, and weight gain in control group.

In control group, the calculated chi - square value was 2.019, 0.432, 0.348, 1.273, 0.577 respectively which showed that there was no association between demographic variables of the newborns and weight gain at $p < 0.05$ level.

CHAPTER – V

DISCUSSION

This chapter deals with the discussion of the result of the data analysis to evaluate the effectiveness of coconut oil massage on weight gain among low birth weight newborns.

MAJOR FINDINGS OF THE STUDY

The major findings of the study were:

1. With regards to demographic data of mother all the mothers 100% had weight gain of 7 – 12 kg during pregnancy and no one 0% had the weight gain of 1 – 6 kg during pregnancy in experimental group.
2. In control group 96.6% had the weight gain of 7 – 12 kg during pregnancy and 3.3% had the weight gain of 1 – 6 kg during pregnancy.
3. With respect to demographic data of newborn majority of the newborns 90% were comes under the age of eight to eleven days and 10% of newborns were comes under the age of twelve to fifteen days in experimental group.
4. In control group 86.6% newborns were comes under the age of eight to eleven days and had breast feeding and 13.3% of newborns were comes under the age of twelve to fifteen days and had expressed breast feeding.
5. In Post test the mean score of experimental group was 2.51 and the control group mean score was 2.34. And the calculated't' value was 10.25.
6. In experimental group the mean pre test score was 2.24 and mean post test score was 2.51. The mean difference between pre test and post test was 0.27. and the calculated 't' value was 27.09.

7. In control group the mean pre test score was 2.19 and mean post test score was 2.34. The mean difference between pre test and post test was 0.15. And the calculated 't' value was 16.05.
8. There was a significant association in the sex of the newborn in experimental group. The calculated chi – square value was 8.886.

The discussion is based on the objectives of the study and the hypothesis specified in the study.

The first objective was to assess the pre test level of weight among low birth weight newborns in experimental and control group.

The study results shows that the pre test level of weight among low birth weight newborns in experimental and control group.

With regard to pre test level of baby weight among experimental group, 16 (53.33%) of newborns were under the weight of 2000 – 2250 grams and 14 (46.66%) of newborns were under the weight of 2251 – 2500 grams.

With regard to pre test level of baby weight in the control group, 19 (63.33%) of newborns were under the weight of 2000 – 2250 grams and 11 (36.66%) of newborns were under the weight of 2251 – 2500 grams.

The second objective was to find out the effectiveness of coconut oil massage on weight gain among low birth weight newborns in experimental and control group.

The study results show that there was a significant weight gain after coconut oil massage for low birth weight newborns in experimental group.

Majority of the newborns 15 (50%) had good weight gain, and also 15 (50%) newborns had very good weight gain and no one comes under the category of very poor, poor and average. This shows that experimental group newborn had very good and good weight gain after coconut oil massage.

With regard to the experimental group the post test mean value was 2.51 with standard deviation of 0.17. In control group the mean value was 2.34 with standard deviation of 0.22. The calculated 't' value was 10.25 indicating that there was significant difference in post test level of weight gain among experimental and control group at $p < 0.05$ level.

The hypothesis (H_1) stated that "The mean post test level of weight gain among low birth weight newborns in experimental group will be significantly higher than the mean post test level of weight gain in control group at $p < 0.05$ level. In this study the mean post test level was significantly higher in experimental group than the control group. Thus the hypothesis was accepted.

The above result was supported by **Javadifar N (2008)** conducted a study that the effectiveness of massage with coconut oil on weight gain of low birth weight newborns. The study is a clinical trial which was carried out on 72 healthy low birth weight neonates. The sampling was done randomly based on the purpose of the study. Neonates were divided in to three equal groups (24 in each): control, massage and massage with coconut oil. In massage group massaging was done three times a day and each session lasted for five minutes based on the techniques started from the day 3 to 17 after birth. In oil massage group the same technique was done with 10ml per kg coconut oil for the same period. In control group there was no intervention. There was a significant difference in average weight gain seven days after intervention in

massage with oil (2525.42 grams) to control group (2267.29 grams). This study shows that massage with coconut oil is an effective and valuable method in weight gain in low birth weight neonate.

The third objective was to compare the pre and post test level of weight among experimental group.

The pre test mean value was 2.24 with standard deviation of 0.14. The post test mean value was 2.51 with standard deviation of 0.17. The mean difference is 0.27. The calculated 't' value was 27.09 indicating that there was significant difference in pre and post test level of baby weight among experimental group.

The hypothesis (H₂) "There is a significant difference between meanpre test and mean post test level of weight among experimental group at p<0.05 level". In this study there was a significantdifference between pre and post test level of weight among experimental group. Thus the hypothesis was accepted.

The above findings were supported by **Arora J (2005)** stated the study about the effect of coconut oil massage on growth in low birth weight infants. The study was conducted in tertiary level neonatal unit of a teaching hospital. The subjects were infants with birth weight of less than 2500 grams. The design adopted for this study was randomized controlled trial. Eligible neonates were randomized to one of the three groups such as massage with coconut oil, massage without oil and no massage. Weight, length, head circumference and triceps skin fold thickness were measured in three groups at regular intervals. Serum triglycerides levels were measured at enrolment and at completion. The results show that weight gain in the coconut oil massage group (365.8 +/- 165.2 gram) was higher compared to the only massage

group (290.0 +/- 150.2 gram) and no massage group (285.0 +/- 170.4 gram). The researcher concluded that coconut oil massage has a potential to improve weight gain among low birth weight infants.

The fourth objective was to compare the pre and post test level of weight among control group.

The pre test mean value was 2.19 with standard deviation of 0.17. The post test mean value was 2.34 with standard deviation of 0.22. The mean difference is 0.15. The calculated 't' value was 16.05 indicating that there was significant difference in pre and post test level of baby weight among control group.

The hypothesis (H₃) "There is a significant difference between mean pre test and mean post test level of weight among control group at $p < 0.05$ level". In this study there was a significant difference between pre test and post test level of weight among control group. Thus the hypothesis was accepted.

The fifth objective was to associate the post test level of weight gain among experimental and control group of low birth weight newborns with their selected demographic variables.

The calculated chi-square value was 0.587, 0.134, 0.184, 0.156 respectively which shows that there was no association between experimental group with their demographic variables include age of the mother, type of family, family income, mode of delivery and weight gain during pregnancy at $p < 0.05$ level.

The calculated chi-square value was 0, 8.886, 2.142, 0.134, 0, 0.368 respectively which shows that there was no association between experimental group

with their demographic variables include age of the newborn, birth weight, gestational age and type of feeding except sex of newborn at $p < 0.05$ level.

The calculated chi –square value was 0.271, 0.191, 0.878, 0.136, 0.087 respectively which shows that there was no association between demographic variable of mother and weight gain in control group at $p < 0.05$ level.

The calculated chi –square value was 2.019, 0.432, 0.348, 1.273, 0.577, 0.047 respectively which shows that there was no association between demographic variables of the newborns and weight gain in control group at $p < 0.05$ level.

Hence the research hypothesis (H₄) stated that " There is a significant association between the post test level of weight gain among experimental group and control group with selected demographic variables".

In this study there was no significant association among the post test level of weight gain of experimental group and control group except the sex of the newborns in experimental group.

From the above analysis and interpretation, the hypothesis (H₁) "The mean post test level of weight gain among low birth weight newborns in experimental group will be significantly higher than the post test level of weight gain in control group", (H₂) "There will be a significant difference in mean pre test and mean post test level of weight among experimental group" and (H₃) "There will be a significant difference in mean pre test and mean post test level of weight among control group" was accepted and the hypothesis (H₄) "There will be a significant association between the post test level of weight gain among experimental and control group with selected

demographic variables" was rejected except sex of the newborn in experimental group.

The above acceptance of (H_1) , (H_2) and (H_3) was attributed to effectiveness of coconut oil massage on weight gain among low birth weight newborns.

CHAPTER – VI

SUMMARY, CONCLUSION, IMPLICATIONS, LIMITATIONS ANDRECOMMENDATIONS

This chapter deals with summary, conclusion, implication, recommendations and limitations, which creates a base for evidence based practice.

SUMMARY

Birth weight is the single most important criterion for determining the neonatal and infant survival. In India 30 to 35 percent babies are born with low birth weight. WHO estimates that 30 million low-birth-weight babies born annually (23.8% of all births) often face severe short- and long-term health consequences. Low birth weight is a major determinant of mortality, morbidity and disability in infancy and childhood and also has a long-term impact on health outcomes in adult life.

Low birth weight infants run the risk of developing many complications like respiratory distress, sleep apnea, heart problems, jaundice, anemia, chronic lung disorders, and infections.

Coconut oil is light, non – greasy liquid oil. It consists of more than 90% of saturated fats. The benefits of the coconut oil massage includes stimulation of circulatory system, less stress behavior, neurological and neuromotor development, improved sleep, thermoregulation, improved skin condition and barrier function, resulting in reduced loss of transepidermal water and transcutaneous absorption of fatty acids contributing to improved nutrition and better somatic growth.

The aim of the study was to assess the effectiveness of coconut oil massage on weight gain among low birth weight newborns between experimental and control group.

The Objectives of the Study were,

1. To assess the pre test level of weight among low birth weight newborns in experimental and control group.
2. To find out the effectiveness of coconut oil massage on weight gain among low birth weight newborns in experimental and control group.
3. To compare the pre test and post test level of weight gain among experimental group.
4. To compare the pre test and post test level of weight gain among control group.
5. To associate the post test level of weight gain among experimental and control group of low birth weight newborns with their selected demographic variables.

The Hypotheses Formulated were,

Hypotheses was tested at $p < 0.05$ level

- H₁ The mean post test level of weight gain among low birth weight newborns in experimental group was significantly higher than the mean post test level of weight gain in control group.
- H₂ There was a significant difference between mean pre test and mean posttest level of weight gain among experimental group.
- H₃ There was a significant difference between mean pre test and mean posttest level of weight gain among low birth weight newborns among control group.
- H₄ There was a significant association between posttest level of weight gain among low birth weight newborns in experimental and control group with their selected demographic variables.

The Assumptions of the Study were,

1. Low birth weight newborns may have the greatest health risk.

2. Low birth weight newborns may be pre term or full term newborns.
3. Oil massage may improve weight gain.

The review of literature related studies which provided a strong foundation for the study. It includes,

Section A – Studies related to prevalence of low birth weight babies.

Section B – Studies related to using massage therapy on weight gain.

Section C – Studies related to coconut oil massage on weight gain.

The conceptual framework of this study was based on Modified Ludwig Von Bertalanffy's general system theory and it provided a complete framework for achieving the central purpose of the study.

The research design adopted for this study was quasi experimental pre test and post test control group design.

Researcher selected the low birth weight term newborns, by using convenient sampling technique.

The content validity of the tool was established on the basis of opinion of one medical expert and five nursing experts in the field of pediatrics.

The pilot study was conducted in NICU for the period of one week in C.S.I Medical Mission Hospital, Neyyoor and the findings revealed that the tool was feasible, reliable and practicable to proceed with the main study.

The main study was conducted in NICU and post natal ward of James Multispecialty Hospital, Colachel at Kanyakumari District.

Samples of 60 newborns with low birth weight were selected by using convenient sampling method. The collected data was analyzed and interpreted based on objective using descriptive and inferential statistics.

The findings of the study revealed that there was a significant difference on pre test and post test level of weight gain among experimental and control group. There was no significant association coconut oil massage on weight gain between experimental and control group with their selected demographic variables (age of mother, type of family, family income, mode of delivery, weight gain during pregnancy, age of newborn, birth weight, gestational age and type of feeding) except sex of newborn in the experimental group.

CONCLUSION

This study assessed the effectiveness of coconut oil massage on weight gain among low birth weight newborns. The mean difference between pre test and post test level of weight gain in experimental group was 0.27 at $p < 0.05$ level. The low birth weight newborns who were received coconut oil massage had a significant weight gain compared to the low birth weight newborns that who were not received coconut oil massage.

IMPLICATIONS

Investigator has derived from the study that the following implications are of vital concern in the field of nursing practice, nursing education and nursing administration and nursing research.

Implications for Nursing Practice

1. Nurses should be equipped with updated knowledge about weight gain of low birth weight newborns.
2. Pediatric nurses need to take up the responsibility of create awareness among the mothers of low birth weight newborns regarding weight gain.
3. Nurse should use wide variety of intervention to gaining weight for low birth weight newborns.
4. Nurses and health care providers play a vital role in motivating the mothers to practice coconut oil massage.
5. Nursing practice in the community should focus on practice of coconut oil massage and promotion of weight gain.
6. Nurses should organize health education campaign in community about practice of coconut oil massage and importance of weight gain among low birth weight newborns.
7. Develop skills in planning nursing care for effective management and reduce the incidence of low birth weight babies.

Implications for Nursing Education

1. The nurse educator should emphasize health education on prevention of low birth weight babies.
2. Students should be encouraged to identify the complications and to teach the mothers of low birth weight babies.
3. The nurse educators should arrange the in-service education programme (seminars, workshops) for student nurses regarding coconut oil massage and improve the weight gain.
4. The nurse educator can provide an opportunity for students to actively participate in implementing coconut oil massage.

Implications for Nursing Administration

1. The nurse administrator should formulate policies regarding the planning of coconut oil massage on weight gain among low birth weight newborns and emphasis on implementation of that intervention by the pediatric nurse for hospitalized newborns and by the community nurse in community.
2. Nursing administrator should plan and implement collaborative training program on use of coconut oil massage to improve weight gain among low birth weight newborns.

Implications for Nursing Research

1. Nurse researcher should disseminate the findings of the studies through conference, seminar and publishing in professional journals to the pediatric staff.
2. As there is a limited study on this area, nursing researcher should encourage and conduct further researches related to coconut oil massage for weight gain.
3. The findings of the research study will help in building and strengthening the body of knowledge.
4. Evidence based nursing practice must take in order to increase the knowledge about using various oils to improve weight gain among low birth weight newborns.

LIMITATIONS

During the period of study the limitations faced by the investigator were as follows,

1. The study was limited to the small sample.
2. The investigator had difficulty in collecting study material for review from the

Indian context.

3. Generalization could be better if large samples are included.
4. The sample size was too small. Hence the generalization must be done with caution.

RECOMMENDATIONS

Based on the findings of the present study the following recommendations are made:

1. Similar study can be replicated on a large sample.
2. Study can be conducted to assess the effectiveness of coconut oil massage on less stress behavior, neuro motor development, infant parent bonding and improved sleep.
3. Study can be conducted in pre – term newborns.
4. A comparative study can be conducted by using coconut oil versus other different oils to weight gain.
5. Study could be replicated in different setting with large sample to validate the findings.

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APPENDIX-A

LETTER SEEKING PERMISSION FOR CONDUCTING THE STUDY



SRI K. RAMACHANDRAN NAIDU COLLEGE OF NURSING

Approved by Govt. of Tamilnadu and Indian Nursing Council / T.N.C
Affiliated to the Tamilnadu Dr. M.G.R. Medical University

K.R. Naidu Nagar - 627 753, Paruvakudi Village, Post Bag No.1, Karivalam (via)
Sankarankovil (Tk), Tirunelveli (Dt), Ph. : 04636 - 260950, Fax : 04636 - 260377. E - Mail : srikncon@yahoo.com

31.03.2011

To

Dr.Prem Kumar, B.Sc., M.B.B.S.,
Director,
James Multispeciality Hospital,
Colachel,
Kanyakumari District.

Mrs. S. Evangelin Sally is a bonafide student of our college studying in M.Sc (N) programme. As a partial fulfillment of the university requirement for the award of M.Sc (N) degree, She needs to conduct research project.

Her chosen research project is as follows **“A study to assess the effectiveness of Coconut Oil Massage on weight gain among low birth weight newborns In James Multispeciality Hospital, Colachel at Kanyakumari District, April 2011.”**

She will abide by the rules and regulations of the hospital and adhere to hospital policies during her period of data collection. Permission may kindly be granted to her for conduction of the study at your hospital.

Further details of the proposal project will be furnished by the student personally, Confidentiality will be ensured in the research project.

Thanking you

Permitted

S. Prem Kumar
Dr. J. PREMKUMAR, B.Sc;M.B.B.S;M.Phil)
Reg. No. 56420
MANAGING DIRECTOR,
JAMES HOSPITAL,
COLACHEL - 629251, K. K. DIST,

Yours faithfully

S. Ramachandran Naidu
Principal 31/3/11
Sri K. Ramachandran Naidu
College of Nursing
K.R. Naidu Nagar - 627 753, Karivalam (Via)
Sankarankovil (T.K.) Tirunelveli Dt.,

APPENDIX – B

LETTER SEEKING EXPERT OPINION TO VALIDATE

RESEARCH TOOL

From

Mrs.S.Evangelin sally,
M.sc (N) I year
Sri. K. Ramachandran Naidu College of Nursing
Sankarankovil.

To

Subject: Seeking validation of tool and content validity.

Respected Madam,

I am 1st year of M.sc Nursing student studying at Sri. K. Ramachandran Naidu College of Nursing, Sankarankovil, working on dissertation titled, "**A study to assess the effectiveness of coconut oil massage on weight gain among low birth weight newborns in James Multispeciality hospital at Kanyakumari district**".

The dissertation is to be submitted to the Tamil Nadu Dr. M. G. R Medical University, as a partial fulfillment for the requirement of M.sc (Nursing) degree.

Hence I request you to kindly evaluate the tool items and give your valuable opinion and suggestions for improvement of this tool.

I would be highly obliged and thankful to hear from you.

Thanking you in anticipation.

Yours sincerely,
S. Evangelin Sally

Enclosures

1. Statement of the problem
2. Research tool
3. Scoring key
4. Self addressed envelop

APPENDIX – C

LIST OF EXPERTS FOR CONTENT VALIDITY

1. **Dr.(Mrs).Reena Evency, M.Sc (N), PhD,**
Principal,
St.Xavier Catholic College of Nursing,
Chungankadai,
Kanyakumari District.

2. **Mr. Nandeesh J.Geruda, M.Sc (N),**
Principal,
Gangothri College of Nursing,
Rajiv Gandhi Nagar,
Viswaneedam (p.o),
Bangalore.

3. **Dr.(Mrs).Judi, M.sc (N), PhD,**
Principal,
Vel R.S College of nursing,
Vellanoor, Avadi,
Chennai.

4. **Mrs.F.Malchijah, M.Sc (N),**
HOD of Pediatric Nursing,
Christian College of Nursing,
Neyoor (P.o),
Kanyakumari District.

5. **Mrs.Kalai Kuru Selvi, M.Sc (N),**
HOD of Pediatric Nursing,
Matha College of Nursing,
Mana Madurai,
Sivagangai District.

6. **Dr. Laxmanan, M.B.B.S., M.D (Pead),, D.CH.,**
Pediatric Consultant,
James Multispeciality Hospital,
Colachel.

APPENDIX – D

CERTIFICATE OF ENGLISH EDITING

To whom so ever it may concern

This is to certify that **Mrs. S. Evangelin sally**, II year, M.Sc nursing, student of Sri. K. Ramachandran Naidu College of nursing, Sankarankovil (TK), Tirunelveli, has done a dissertation study on "**To assess the effectiveness of coconut oil massage on weight gain among low birth weight newborns in James Multispeciality Hospital at Kanyakumari district**". This study was edited for English language appropriateness.

Name: Mr.L.Christu Dhas, M.A., M.Ed., M.Phil.

Signature

APPENDIX – E
INFORMED CONSENT

Good Morning,

I, Mrs. S. Evangelin Sally, M.Sc. Nursing., II year student of Sri. K. Ramachandran Naidu College of nursing, conducting a study "**To assess the effectiveness of coconut oil massage on weight gain among low birth weight newborns in James Multispeciality Hospital at Kanyakumari District**", as a partial fulfillment of the requirement for the degree of M.Sc nursing under The TamilNadu Dr. M. G. R Medical University. Apply 20 ml of coconut oil and give massage to the entire body of the low birth weight newborns for 2 times a day with the duration of 15 minutes for five days. Weight gain was assessed by Electronic infant weighing scale.

I assure you that information obtained will be kept confidential. So, I request you to kindly co – operate with me and participate in this study by giving your frank and voluntary consent.

Thanking you

Signature of newborn's mother,

(Name of the mother)

APPENDIX – F

COPY OF THE TOOL FOR DATA COLLECTION

SECTION-A

BACKGROUND DATA OF MOTHER

1. Age of the mother
 - a) 15-25yrs b) 26-35yrs
2. Type of family
 - a) Nuclear family b) Joint family
3. Income of the family
 - a) <Rs 6000 per month b) >Rs 6000 per month
4. Mode of delivery
 - a) Vaginal delivery b) LSCS
5. Weight gain by the mother during pregnancy
 - a) 1-6 kg b) 7-12 kg

SECTION-B

BACKGROUND DATA OF NEWBORN

1. Age of the newborn
 - a) 8-11days b) 12-15days
2. Sex of the newborn
 - a) Male b) Female
3. Birth weight of the newborn
 - a) 2000-2250gms b) 2251-2500gms

4. Gestational age

a)37-38 weeks b)39-40 weeks

5. Type of feeding

a) Breast feeding b) Expressed breast feeding

SECTION-C

The weight gain is assessed by Electronic infant weighing scale. Electronic infant weighing scale especially adapted for use as a pediatric or infant scale having a mechanical leverage weighing structure with a high degree of sensitivity and low friction and hysteresis coupled with a compatible electronic measuring system and a digital read-out system is provided. This electronic weighing scale is invented by **Tushmut** and **Walter P.** The weighing scale used by the investigator was calibrated on 15-01-2011.

APPENDIX – G

The average weight gain for the term baby is 20 to 30gms/day.

By giving coconut oil massage there is an additional weight gain of nine to eleven gms/day.

SCORING KEY

Very poor - <145gms/5 days

Poor - 146-165gms/5 days

Average - 166-185gms/5 days

Good - 186-205gms/5 days

Very good - >206gms/5 days

APPENDIX – H

INTERVENTION

PROCEDURE

1. Rapport was established with the mothers and a brief introduction about the study was given. Consent was obtained from each mother and reassurance was provided.



2. Undress the newborn.



3. On the first day the investigator checked the weight of the newborns in both experimental and control group.



4. A conducive environment was established before initiation of coconut oil massage. Massage was given ideally 45 minutes to one hour after a feed to avoid regurgitation or vomiting. Twenty milliliter of coconut oil was applied to the entire body with the duration of 15 minutes to the experimental group for five days.



5. Massage given to the entire body of the newborns starting from head, neck, chest, abdomen, back and extremities with finger pads for two times a day with the duration of 15 minutes to the experimental group for five days.



Massaging the head and neck



Massaging the chest



Massaging the back



Massaging the hands



Massaging the foot

6. The control group was not received the coconut oil massage. On the sixth day the weight was assessed by electronic infant weighing scale for both experimental and control group.

