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# EFFECTIVENESS OF OLIVE OIL MASSAGE ON WEIGHT GAIN AMONG LOW BIRTH WEIGHT NEONATES: A QUASI-EXPERIMENTAL STUDY

**Author's Name**: Arpita[1], Richie John[2]

**Affiliation**:

1. Nursing Tutor, College of Nursing, Government Medical College, Ambedkar Nagar, Uttar Pradesh, India.

2. Associate Professor, Yashraj Institute of Professional Studies, Kanpur, Uttar Pradesh, India.

**Corresponding Author Name & E-Mail:** Arpita, arpita19683@gmail.com

## ABSTRACT

*Low birth weight (LBW) remains a major public health concern and is one of the leading causes of neonatal morbidity and mortality worldwide. Neonates weighing less than 2500 grams at birth are at increased risk of hypothermia, infections, feeding difficulties, delayed growth, and developmental complications. Various non-pharmacological interventions have been explored to improve growth outcomes among these vulnerable infants. Olive oil massage is a simple, low-cost, and culturally acceptable intervention that may enhance weight gain through tactile stimulation, improved circulation, enhanced digestion, and reduced energy expenditure. The present study aimed to assess the effectiveness of olive oil massage on weight gain among low birth weight neonates admitted to a neonatal intensive care unit. A quasi-experimental pre-test and post-test control group design was adopted. Forty low birth weight neonates were selected using purposive sampling, with 20 neonates assigned to the experimental group and 20 to the control group. The experimental group received olive oil massage at a dose of 5 ml/kg body weight for 15 minutes twice daily for ten consecutive days, while the control group received routine care. Weight measurements were recorded daily. Findings revealed a statistically significant increase in weight among neonates who received olive oil massage compared with those who received routine care. The study concludes that olive oil massage is an effective intervention for promoting weight gain among low birth weight neonates and should be considered as a supportive nursing practice in neonatal care settings*

**Keywords: Low birth weight neonates, olive oil massage, neonatal growth, weight gain, neonatal nursing, infant massage, neonatal intensive care.**



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## INTRODUCTION

The neonatal period represents one of the most critical phases of life and significantly influences long-term health outcomes. During the first twenty-eight days after birth, newborns undergo rapid physiological adaptation to extrauterine life. Adequate nutrition and growth during this period are essential for survival and healthy development. However, low birth weight neonates face considerable challenges that may compromise growth and increase susceptibility to illness.Low birth weight is defined by the World Health Organization as a birth weight less than 2500 grams irrespective of gestational age. Globally, approximately 15–20% of all births are classified as low birth weight, accounting for more than 20 million births annually. The prevalence is particularly high in developing countries due to maternal malnutrition, poor antenatal care, infections, poverty, and socioeconomic inequalities.

Low birth weight neonates often experience difficulties maintaining body temperature, establishing effective feeding patterns, resisting infections, and achieving adequate weight gain. Failure to gain weight appropriately may lead to prolonged hospitalization, developmental delays, and increased healthcare expenditures. Consequently, healthcare providers continuously seek interventions that are safe, affordable, and effective in promoting neonatal growth.Massage therapy is an ancient practice that has been used for centuries to improve health and well-being. In neonatal care, massage has gained considerable attention because of its potential benefits in enhancing growth, improving sleep patterns, promoting neurological development, and strengthening parent–infant bonding. Among various oils used for infant massage, olive oil is particularly attractive because of its rich nutritional composition and skin-protective properties.

Olive oil contains monounsaturated fatty acids, antioxidants, vitamin E, and anti-inflammatory compounds. These components contribute to skin integrity, thermoregulation, and overall physiological well-being. When combined with therapeutic massage, olive oil may enhance growth among low birth weight infants through multiple physiological mechanisms.

The present study was undertaken to evaluate the effectiveness of olive oil massage on weight gain among low birth weight neonates admitted to a neonatal intensive care unit.

## NEED FOR THE STUDY

Low birth weight continues to be a major contributor to neonatal morbidity and mortality. Despite advances in neonatal care, many infants struggle to achieve optimal growth during hospitalization. Traditional approaches to promoting weight gain often focus primarily on nutritional support; however, complementary interventions that enhance physiological functioning may provide additional benefits.Massage therapy has emerged as a promising intervention because it is inexpensive, non-invasive,


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easy to administer, and acceptable to families. Evidence suggests that massage may stimulate vagal activity, improve digestion, increase nutrient absorption, enhance circulation, and reduce stress responses. These physiological effects may contribute to accelerated weight gain.

Olive oil massage is particularly relevant in resource-limited settings because olive oil is widely available, affordable, and safe for neonatal skin. Although several studies have reported positive effects of oil massage on infant growth, further evidence is required to establish its effectiveness among low birth weight neonates in specific healthcare settings.Nurses play a central role in neonatal care and are ideally positioned to implement massage interventions. Establishing evidence regarding the effectiveness of olive oil massage can contribute to improved nursing practice and better neonatal outcomes.

## OBJECTIVES OF THE STUDY

1. To compare pre-test and post-test weight among low birth weight neonates receiving olive oil massage.
2. To compare weight gain between experimental and control groups.
3. To determine the effectiveness of olive oil massage on weight gain among low birth weight neonates.
4. To identify any association between weight gain and selected demographic variables.

## REVIEW OF LITERATURE

The literature review revealed substantial evidence supporting massage therapy as an effective intervention for promoting growth among low birth weight infants.

Several researchers have demonstrated that tactile stimulation enhances physiological stability and growth. Massage therapy stimulates sensory receptors in the skin, activating neural pathways that influence autonomic nervous system functioning. Increased vagal activity promotes gastrointestinal motility and digestive efficiency, facilitating nutrient absorption and growth.Field and colleagues reported that premature infants receiving massage therapy exhibited significantly greater weight gain than those receiving standard care. The researchers suggested that increased vagal activity and improved metabolic efficiency contributed to enhanced growth outcomes.Studies examining oil massage have reported similar findings. Sunflower oil massage, coconut oil massage, and olive oil massage have all been associated with increased weight gain among preterm and low birth weight infants. Oil application appears to improve skin barrier function, reduce transepidermal water loss, and support thermoregulation.

Research has also shown that massage therapy reduces stress hormones such as cortisol while increasing growth-promoting hormones. Lower stress levels enable infants to conserve energy and direct more resources toward growth and development. Additional benefits of massage therapy include improved sleep


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patterns, enhanced behavioral organization, stronger parent–infant attachment, and reduced length of hospital stay. These findings support the use of massage as a comprehensive developmental care intervention. Although evidence supporting massage therapy is growing, studies specifically evaluating olive oil massage among low birth weight neonates remain relatively limited. Therefore, further investigation was warranted.

## CONCEPTUAL FRAMEWORK

The study was based on the concept that tactile stimulation provided through olive oil massage influences physiological processes that support growth. Massage stimulates the nervous system, enhances circulation, improves digestion, reduces stress responses, and promotes metabolic efficiency. These physiological changes contribute to improved weight gain among low birth weight neonates.

## MATERIALS AND METHODS

### Research Approach

A quantitative research approach was adopted for the study because it enabled objective measurement of weight gain and evaluation of intervention effectiveness.

### Research Design

A quasi-experimental pre-test and post-test control group design was utilized. This design allowed comparison of weight gain between neonates receiving olive oil massage and those receiving routine care.

### Setting of the Study

The study was conducted in the Neonatal Intensive Care Unit (NICU) of Rama Hospital, Kanpur.

### Population

The target population consisted of low birth weight neonates admitted to the NICU.

### Sample

Forty low birth weight neonates meeting the inclusion criteria were selected. Twenty neonates were assigned to the experimental group and twenty to the control group using purposive sampling.

### Inclusion Criteria

- Neonates weighing less than 2500 grams.


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- Medically stable neonates.
- Neonates admitted to the NICU.
- Parents willing to provide informed consent.

**Exclusion Criteria**

- Critically ill neonates.
- Neonates with congenital anomalies.
- Neonates requiring major medical interventions.

**Reliability of the Tool**

The reliability of the instrument was established using inter-rater reliability. The tool was administered simultaneously by two nursing personnel to ten individuals, and the obtained reliability coefficient (r) was 0.99, indicating excellent reliability.

**Pilot Study**

A pilot study was conducted among ten low birth weight neonates to assess the feasibility of the methodology. The pilot study confirmed the practicality and feasibility of the research design. These participants were excluded from the final study.

**Data Collection Procedure**

Permission was obtained from the hospital authorities and ethical approval was secured before commencement of data collection. Mothers were informed about the study objectives, and written consent was obtained.

Baseline demographic information was collected through interviews with mothers. Pre-test weight measurements were recorded before initiation of the intervention.

The experimental group received olive oil massage at a dose of 5 ml/kg body weight. Massage was administered for 15 minutes in the morning and 15 minutes in the evening for ten consecutive days. Daily weight measurements were recorded in the morning before massage sessions. The control group received routine neonatal care without massage intervention.

**Ethical Considerations**

Ethical approval was obtained from the institutional authorities. Mothers were informed about the purpose of the study, confidentiality was maintained, and participation was voluntary. No routine care was withheld, and participants retained the right to withdraw at any stage.


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## RESULTS

Analysis was performed using descriptive and inferential statistics.

The demographic characteristics of mothers in both experimental and control groups were comparable. Most mothers belonged to the age group of 15–24 years, were Hindus, and belonged to nuclear families. No statistically significant differences existed between groups regarding demographic variables, indicating group homogeneity.

Regarding maternal characteristics, most mothers had mild anemia during pregnancy and gained less than ten kilograms during gestation. Educational status and socioeconomic characteristics were also similar between groups.

The primary outcome variable was weight gain among low birth weight neonates. Pre-test weight measurements indicated comparable baseline weights between the experimental and control groups.

Following ten days of intervention, neonates receiving olive oil massage demonstrated significantly greater weight gain than those receiving routine care. Statistical analysis revealed a significant difference between pre-test and post-test weights in the experimental group, indicating that olive oil massage positively influenced growth.

Comparison of mean weight gain between groups further confirmed the effectiveness of the intervention. The experimental group achieved higher average weight gain compared with the control group, demonstrating the beneficial impact of olive oil massage on neonatal growth.

No significant association was identified between weight gain and selected demographic variables, suggesting that the observed improvement was attributable primarily to the intervention rather than background characteristics.

## DISCUSSION

The findings of the present study support the hypothesis that olive oil massage enhances weight gain among low birth weight neonates. The significant increase in weight observed among infants receiving massage is consistent with previous research findings.Several physiological mechanisms may explain the observed outcomes. Massage therapy stimulates pressure receptors in the skin, leading to increased vagal activity. Enhanced vagal stimulation improves gastric motility and digestive function, facilitating more efficient nutrient absorption. Improved digestion contributes directly to weight gain and growth.

Massage also promotes relaxation and reduces physiological stress. Lower cortisol levels allow greater energy allocation toward growth rather than stress responses. This mechanism may be particularly important among low birth weight infants, who often experience substantial physiological challenges.


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The use of olive oil may further enhance therapeutic effects. Olive oil provides lubrication during massage, reducing friction and improving comfort. Its antioxidant and anti-inflammatory properties support skin health and may contribute indirectly to physiological well-being. Improved circulation represents another plausible mechanism. Massage increases blood flow to tissues, enhancing oxygen and nutrient delivery. Better circulation supports cellular metabolism and tissue growth.

The findings align with previous studies reporting positive effects of massage therapy on weight gain among premature and low birth weight infants. Consistency across studies strengthens confidence in the effectiveness of massage interventions.Beyond weight gain, massage may offer additional developmental benefits. Improved sleep quality, enhanced parent–infant bonding, and better behavioral organization have been reported in previous research. Although these outcomes were not specifically measured in the present study, they represent important considerations for future investigation.The absence of significant associations between demographic variables and weight gain suggests that olive oil massage may be broadly applicable across diverse populations. This finding enhances the generalizability of the intervention and supports its implementation in various healthcare settings.

## NURSING IMPLICATIONS

The findings have important implications for neonatal nursing practice.

### Nursing Practice

Nurses can incorporate olive oil massage into routine neonatal care for medically stable low birth weight infants. The intervention is simple, inexpensive, and non-invasive, making it highly feasible in clinical settings.

### Nursing Education

Nursing education programs should include training in neonatal massage techniques and evidence-based developmental care practices. Competent nurses can effectively implement and teach massage interventions.

### Nursing Administration

Hospital administrators should develop protocols supporting the integration of massage therapy into neonatal care services. Resources should be allocated for staff training and program implementation.

### Nursing Research

Further research should explore long-term developmental outcomes associated with olive oil massage. Comparative studies examining different oils and massage techniques may provide additional evidence regarding optimal practice.



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## RECOMMENDATIONS

1. Replication of the study with larger sample sizes.
2. Multicenter studies involving diverse populations.
3. Longitudinal studies examining developmental outcomes.
4. Comparative studies of different oils.
5. Evaluation of parental involvement in massage interventions.
6. Cost-effectiveness analyses.
7. Integration of massage therapy into neonatal care guidelines.

## LIMITATIONS

The study was limited by the relatively small sample size and single-center setting. The intervention period was limited to ten days, and long-term outcomes were not assessed. Despite these limitations, the findings provide valuable evidence regarding the effectiveness of olive oil massage.

## CONCLUSION

Low birth weight remains a significant challenge in neonatal healthcare. Effective, affordable, and evidence-based interventions are needed to promote growth and improve outcomes among vulnerable infants. The present study demonstrated that olive oil massage significantly enhanced weight gain among low birth weight neonates compared with routine care.The intervention appears to exert beneficial effects through improved digestion, enhanced circulation, reduced stress responses, and better physiological regulation. Olive oil contributes additional benefits through its skin-protective and nutritional properties.Given its simplicity, safety, affordability, and effectiveness, olive oil massage should be considered a valuable adjunct to routine neonatal care. Nurses play a critical role in implementing this intervention, educating parents, and monitoring outcomes. Wider adoption of olive oil massage has the potential to improve neonatal growth, reduce hospitalization, and enhance overall quality of care for low birth weight infants.


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