Arab American University

Faculty of Graduate Studies

Effectiveness of Kangaroo Mother Care on Premature in the NICUs at Caritas Baby Hospital and Holy Family Hospital in West Bank, Palestine

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This thesis was submitted in partial fulfillment of the requirements for the Master's degree in Neonatal Nursing

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Thesis Approval

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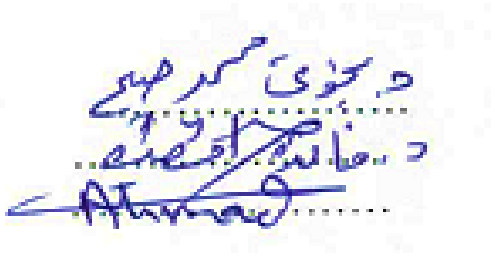

Declaration

I am, Rania Khaled Bannoura hereby declare that the research work presented in the thesis titled " Effectiveness of Kangaroo Mother Care on Premature in the NICUs at Caritas Baby Hospital and Holy Family Hospital in West Bank, Palestine. This thesis is my own, except for quotations and summaries which have been duly acknowledged, and that it has not been submitted elsewhere for the award of any degree.

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Date: 01-09- 2024

Dedication

This study is wholeheartedly dedicated to my beloved parents. Thank you so much for everything! Words can hardly describe my thanks and appreciation to you. You have been my source of inspiration, support, and guidance. You have taught me to be unique, and determined, to believe in myself, and to always persevere. I am truly thankful and honored to have you as my parents. To my husband Fadi, you have been a listener and a supporter of all my endeavors. Your partnership, steadfastness, and love sustain me. To my daughter, Lourd, and my son, Adrian, remember all things are possible. Never be afraid to pursue your dreams and goals. You both are precious gifts from the Lord. I love you without measure. Thank you for your patience as I pursued and completed this degree. To my relatives, mentors, friends, colleagues, and classmates who shared their words of advice and encouragement to finish this study. Moreover, I dedicated this thesis to the Almighty God, thank you for the guidance, strength, power of mind, protection, and skills and for giving us a healthy life. Finally, to all those who have crossed my path, leaving behind traces of wisdom, inspiration, and support, I extend my heartfelt gratitude. This thesis is dedicated to each of you, for your immeasurable impact on my life and for being the pillars of strength on this journey.

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Rania Bannoura

Abstract

Introduction: "Preterm birth is considered to be the largest direct cause of neonatal mortality and morbidity. Kangaroo care (Skin-to-skin contact) is the simplest, most cost-effective, and life-saving intervention a baby can get, starting kangaroo mother care immediately after birth has the potential to save up to 150,000 more lives each year. Kangaroo mother care greatly improves a premature or low birth weight baby's chances of survival" Aim: to evaluate the effectiveness of kangaroo mother care on premature in the Neonatal Intensive Care Units at Caritas Baby Hospital and Holy Family Hospital in West Bank, Palestine**.** Methodology: A Quantitative, Cross-sectional study design was used. A total of 52 premature infants were included in this study from Caritas Baby Hospital and Holy Family Hospital in West Bank, Palestine. Patient data was obtained and processed confidentially via questionnaires. Results: The results of the current study, which included 52 neonates and their mothers, demonstrate the potential advantages of Kangaroo mother care in promoting physiological well-being and stabilizing vital signs in neonates, thereby endorsing its value as an adjunctive care measure in neonatal healthcare settings**.** Conclusion: It has been shown that Kangaroo mother care positively influences all preterm newborn physiological parameters and is essential for improving maternal-child connection and sleep pattern control **.**

Keywords: Palestine, Kangaroo Mother Care, Effectiveness of Kangaroo Care, Neonatal Intensive Care, Premature Infants, Low Birth Weight Infants, Physiological Stress.

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Abbreviations

AAUP	"Arab American University Palestine"
KMC	Kangaroo Mother Care
BPD	"Bronchopulmonary dysplasia"
BW	"Birth weight"
SGA	"Small for gestational age"
LBW	"Low birth weight"
AGA	Appropriate for gestational age
HR	Heart Rate
RR	Respiratory Rate
BP	Blood Pressure
CPAP	Continuous Positive Airway Pressure
HFH	Holy Family Hospital
CBH	Caritas Baby Hospital
HFOV	High-Frequency Oscillatory Ventilation
NEC	"Necrotizing enterocolitis"
NICU	"Neonatal intensive care unit"
RDS	"Respiratory distress syndrome"
SPSS	Statistical package for social sciences
Std	Standard deviation
WHO	"World Health Organization"
CDC	"Centers for Disease Control and Prevention"
NIH	"National Institutes of Health"

Chapter One

(Introduction)

1.1. Background

A preterm birth is defined as a delivery that takes place before 37 weeks of gestation. Low-birth-weight infant (LBW) is defined as an infant with a birth weight lower than 2500g, regardless of gestational age. The Caritas Baby Hospital treats between five to ten preterm babies per month on average a minimum of 25 weeks till term. We have a fully prepared team that includes neonatologists, and NICU nurses, in addition to excellent completely operational equipment and well-designed NICU rooms.

Kangaroo mother care (KMC) is a method of holding a baby that involves skin-to-skin contact. The baby, who normally wears only a diaper, is placed in an upright position against a parent's bare chest. Both mothers and fathers can do kangaroo care. It's often used with premature infants while they are still in the hospital. Kangaroo Mother Care is considered useful for nursing preterm and LBW infants. it provides infants with the basic needs for survival, like a mother's warmth, stimulation of breast milk, love, and protection. It became a very important way of caring for these high-risk infants. To achieve consistent temperature regulation and enhanced survival for these children, KMC is a cost-effective supplemental technique for caring for LBW and preterm neonates. One of the World Health Organization's (WHO) 10 recommendations for treating preterm infants is KMC. Evidence-based research has demonstrated the effectiveness of KMC in decreasing preterm neonatal mortality and morbidity, avoiding infection and hypothermia, enhancing mother-infant connection, and lengthening the duration of exclusive breastfeeding. "Kangaroo Mother Care (KMC), also known as skin-to-skin care, refers to placing the newborn upright on the mother's (or father's) chest for the

desired warmth and security, named for the way marsupials such as kangaroos take care of their babies and toddlers. The past several decades have seen a significant improvement in the survival rates for preterm newborns. This could be explained by the implementation of medical protocols such as the administration of surfactants, noninvasive breathing, and antenatal corticosteroids. The KMC decreases the risk of mortality, and infection severity, and increases infant growth, breastfeeding, and mother-infant attachment. Premature infants are born before the development of major organs, which takes place throughout the rapid organ growth period (Gestational age ≥28 weeks). Hence, survivors of premature birth could have later undesirable health effects associated with organs failing to achieve the best possible development or encountering more rapid decline" (Pravia & Benny, 2020).

In 2022, "the World Health Organization published new recommendations on the care of the preterm infant. These reflect new evidence that simple interventions such as KMC immediately after birth, early initiation of breastfeeding, use of continuous positive airway pressure (CPAP), and medicines such as caffeine for breathing problems can substantially reduce mortality in preterm and low birth weight babies".

To conclude, KMC involves skin-to-skin contact with the baby placed against a parent's chest, benefiting preterm and LBW infants by providing warmth, stimulating breast milk, and enhancing bonding. KMC is cost-effective, supports temperature regulation, and improves survival rates. It's endorsed by the WHO for its effectiveness in reducing neonatal mortality and morbidity.

1.2. Problem Statement

"The premature infant is highly vulnerable to neurodevelopmental and growing impairment due to immaturity. Moreover, they require very intensive and delicate care to support their health, psychosocial, and developmental needs as well as the needs of their family. In the healthcare field, written guidelines are essential objective guidance tools. In 2020, Caritas Baby Hospital (CBH) standardized a policy about kangaroo mother care and its effectiveness on both premature infants and the mother. However, the successful adoption and implementation of the policy have not been conducted yet. In addition, the nursing team working in the NICU has not been attentive to the significance of the KMC policy, with the high percentage of premature infants in the NICU and all the strengths and benefits of KMC. Moreover, many new nurses who are unfamiliar with NICU still lack the necessary skills to work with premature patients. Additionally, the lack of funding for scientific research and time limitations. Therefore, this current study will aim to evaluate the effectiveness of KMC on premature clinical outcomes before and after its implementation in the NICU of both hospitals" (Caritas Baby Hospital & Holy Family Hospital).

1.3. Significance of Study

Premature delivery accounts for 39% of the newborns hospitalized in the NICU, which is considered the highest percentage compared with other health conditions. Accordingly, the premature infant is at high risk for developmental and growing impairment due to immaturity. One of the most affordable methods available for maintaining tiny and ill infants is KMC. KMC offers notable benefits, but international adoption is still limited. Several studies have identified challenges to KMC. There are challenges with the health system, such as a lack of space, limited provider desire or competency, and inadequate

staff time to assist parents with KMC. Poor KMC adoption has also resulted from social norms and attitudes, such as poor cultural judgments of preterm and low birth-weight newborns (Gebremariam et al., 2022).

One nursing technique that provides medical care and meets the critical physical and emotional requirements of preterm infants, including warmth, stimulation, bonding to parents, breastfeeding, and safety, is called "Kangaroo Care." Previous studies have proven the benefit of KMC in enhancing the health and well-being of both preterm and low birth weight infants, as well as motivating parental involvement in the infant's care (Charpak et al., 2017).

1.4. Study Objectives

1.4.1. General Objective

The general objective of the study is to “Evaluate the effectiveness of KMC on Premature in the NICUs at Caritas Baby Hospital and Holy Family Hospital in West Bank, Palestine”.

1.4.2. Secondary Objectives

1. To improve awareness among the mothers concerning KMC.
2. To emphasize the importance of KMC in the premature excellent clinical outcome.
3. To assess the effectiveness of KMC regarding vital signs in premature and LBW infants

1.5. Research Questions

1- Is there a significant relationship between KMC and the mother's Knowledge?

2- Is there a significant relationship between KMC and mother's satisfaction?

3- Is there a significant relationship between implementing the KMC technique and a better outcome for premature infants' regarding Vital Signs?

4- Is there a significant relationship between mothers' knowledge and satisfaction scores, in relation to the duration of their neonates' stay in the NICU?

5- Is there a significant relationship between mothers' knowledge and satisfaction scores, in relation to the babies' current weight?

1.6. Study Variables

Dependent Variables: The effectiveness of KMC, mother's knowledge, and satisfaction.

Independent Variables: Gestational age, Weight, gender, Anthropometric measurement (Head Circumference and Length).

1.7. Theoretical and Conceptual Definition of Kangaroo Mother Care

Kangaroo Mother Care is a comprehensive approach to neonatal care that emphasizes the importance of continuous skin-to-skin contact between the mother and the premature or low birthweight infant. Rooted in attachment theory and humanistic principles of caregiving, KMC aims to replicate the natural environment of the womb by offering warmth, security, and sensory stimulation to promote the infant's physiological and psychological well-being (Charpak et al., 2017).

KMC is based on the idea of attachment, which holds that early experiences of connection between infants and their caregivers establish a framework for both safe attachment and the development of socio-emotional skills. KMC encourages constant skin-to-skin contact, which helps to build an effective parent-infant attachment and promotes emotions of security, safety, and trust (Mehrpisheh et al., 2022). Mother-infant bonding, intimate contact, and close physical proximity are key components of the KMC model, which promotes mother-infant bonding. Skin-to-skin contact induces the production of oxytocin, also known as the "love hormone," which improves

mother bonding and emotions of affection while increasing the relaxation and overall well-being of the newborn. Preterm newborns are particularly vulnerable to heat loss because of their immature thermoregulatory systems.

KMC places a high priority on maintaining thermal stability in these newborns. KMC's intimate touch assists in controlling the baby's body temperature, reducing the chance of hypothermia and promoting physiological stability. Also, support for Breastfeeding: KMC provides regular, unrestricted accessibility to the mother's breast to encourage exclusive breastfeeding or other suitable feeding behaviors. This intimate contact promotes effective breastfeeding patterns, increases milk supply, and improves mother-infant interaction—all of which are essential for the baby's growth and development (Tessier, R., Cristo, M., & Velez, S. 2018).

In conclusion, Kangaroo Mother Care (KMC) is an all-encompassing approach to newborn care that emphasizes supportive nursing, maternal-infant bonding, temperature management, and involvement from parents. KMC is an evidence-based approach that is based on attachment theory and provides a foundation for encouraging the best possible health, development, and well-being for low birthweight and preterm children.

1.8. Theoretical Definition of KMC Associated Factors

Prematurity is defined as a birth before 37 completed weeks of gestation. This is further subdivided based on gestational age into extremely preterm (<28 weeks of gestation), very preterm (28–32 weeks of gestation), and moderate or late preterm (32–37 weeks of gestation) (WHO, 2023).

Low birth weight (LBW) is defined as a birth weight of less than 2500 g. Additionally, there are two categories of low birth weight: very low birth weight (VLBW, <1500 g) and extremely low birth weight (ELBW, <1000 g).) (WHO, 2023).

The term "neonatal sepsis" refers to a systemic condition that has bacterial, viral, or fungal origins, is characterized by hemodynamic abnormalities and clinical manifestations, and results in significant mortality or morbidity (Odabasi & Bulbul, 2020).

Sepsis is a life-threatening condition that arises when the body's response to infection causes injury to its tissues and organs (CDC, 2022).

Respiratory distress syndrome (RDS) Also known as hyaline membrane disease, is the formation of a characteristic translucent membrane in collapsed alveoli, which can result from inadequate pulmonary surfactant production and structural immaturity in the under-developed lungs of preterm infants (NIH, 2022).

Bronchopulmonary dysplasia (BPD) is a chronic lung disease most commonly seen in premature infants who require mechanical ventilation and oxygen therapy for acute respiratory distress (Davidson & Berkelhamer, 2017).

Necrotizing enterocolitis (NEC) is an inflammatory intestinal disease that affects preterm neonates (Trinci et al., 2016).

1.9. Conceptual Framework

This simplified chart which was developed by the researcher provides a visual representation of the conceptual framework of KMC, highlighting its multidimensional approach to neonatal care;

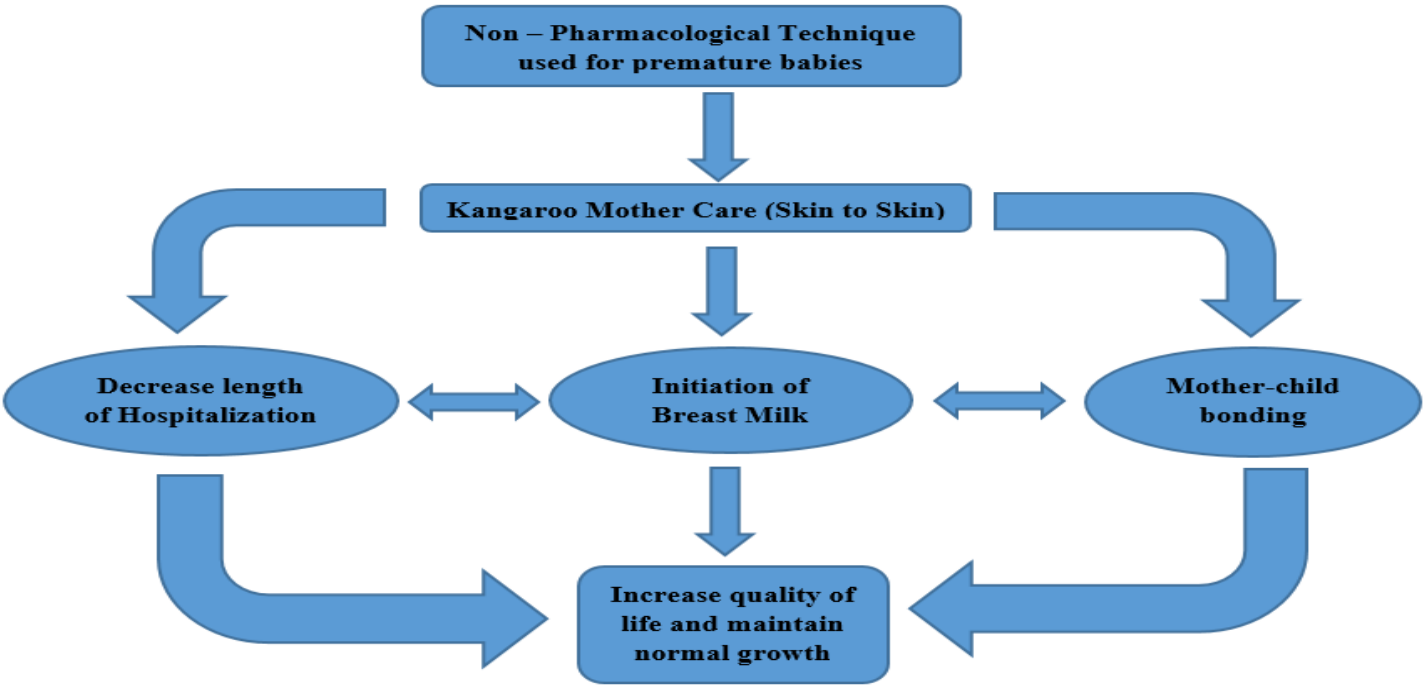

Figure 1-1. Conceptual Framework

Chapter Two

(Literature Review)

2.1. Introduction

The practice of Kangaroo Mother Care (KMC) has recently gained significant attention and importance in hospitals worldwide. Defined by the World Health Organization (WHO) as the care of premature babies carried skin-to-skin with the mother, KMC is a powerful and easy-to-use method to promote the health and well-being of infants born preterm and full-term (Cheong et al., 2020). According to the WHO, KMC has the potential to save up to 450,000 lives annually, with immediate post-birth implementation potentially saving an additional 150,000 lives each year (WHO, 2021). Despite its benefits, such as improved breastfeeding rates, reduced sepsis, hypothermia, and hospital readmissions, KMC faces adoption barriers in neonatal intensive care units (NICUs). Studies have highlighted parental fears of harming their infants and a lack of support from healthcare systems as significant obstacles (Letícia M. Narciso, 2021). KMC not only improves infant survival rates but also enhances maternal emotional well-being, making it a cost-effective, natural intervention for managing preterm infants (Elsevier Inc., 2020). However, gaps in knowledge, attitudes, and practices among parents and healthcare providers, along with socio-economic and cultural factors, hinder its widespread implementation (Belal et al., 2021). KMC involves skin-to-skin contact, exclusive breastfeeding, early discharge, social support, and follow-up, empowering mothers to become primary caregivers for their infants (Disher et al., 2017).

2.2. Global Studies Related to KMC

"The practice of kangaroo care has recently begun to gain increased attention and importance in hospitals around the world. WHO defines Kangaroo Mother Care (KMC) as the care of premature babies carried skin-to-skin with the mother. It is a powerful and easy-to-use method to promote the health and well-being of infants born preterm and full-term" (Cheong et al., 2020).

Kangaroo care has the potential to save up to 450,000 lives annually, according to the WHO. Also, WHO enhanced to start of kangaroo care within the first week of life as the patient's condition is stabilized. It is estimated that kangaroo mother care immediately after birth could save 150,000 more lives each year (WHO, 2021).

A study about Kangaroo Care and the barriers in the neonatal ICU showed that the only important barrier was a fear of hurting their infant, 69% of parents believe that KC is beneficial to their emotional well-being., Kangaroo care could be a safe and natural technique with a no-cost intervention that reduces the length of stay in the hospital for premature infants. (Letícia M. Narciso, 2021).

KMC was related to a 36 % reduced fatality rate than routine care. Kangaroo mother care improved exclusive breastfeeding and reduced the danger of sepsis, low temperature, low blood sugar, and readmission of the baby as well as maintained normal growth. Oral sucrose is used for pain management for premature newborns, research demonstrates that kangaroo care is considered more effective than oral sucrose in the reduction of pain in premature newborns. Kangaroo mother care could be perfect pain management for premature babies (Sen & Manav, 2020).

A study by Bilal et al (2021) showed several knowledge gaps in this area of research, these gaps include KMC knowledge, attitude, and practices among parents of preterm and

low birth weight babies, socioeconomic and cultural factors, and the acceptance of kangaroo mother care as well as this motivation to implement practices and shortage of supply in health care facilities, those gaps will be covered in this research (Bilal et al., 2021).

"KMC is a standardized and protocoled care system for LBW and/or preterm infants at birth, based on skin-to-skin contact between the infant and the mother. It seeks to empower the mother and family, gradually transferring the ability and responsibility of being the primary caregivers of their infant, and meeting their physical and emotional needs" (Disher et al., 2017). "Besides skin-to-skin contact, its other components are exclusive breastfeeding (ideally), starting in the hospital and continuing at home, early discharge, building social support, and follow-up. Although the effectiveness of KMC is evidenced in systematic reviews, these are focused on analyzing the reduction in morbidity and mortality, neonatal pain, and its association with breastfeeding. Therefore, a synthesis of evidence to assess whether the KMC effectively reduces the length of LBW and/or preterm infants' hospital stay is still needed" (Karimi et al., 2019).

Reducing neonatal mortality to 12 or less per 1,000 live births and providing kangaroo mother care (KMC) or other humanized care methods to at least 75% of eligible infants are among the objectives of every Newborn Action Plan launched by the United Nations International Children’s Emergency Fund (UNICEF) (Ghojazadeh ET AL., 2019).

Since existing methods to prevent infant deaths in conventional neonatal care involve a high cost and require qualified human resources and permanent logistical support, the KMC is an effective and safe alternative for infants clinically stable, especially in developing countries where 12% are preterm infants and 60%, occur in Africa and South Asian countries (Sharma ET AL., 2019).

A large number of studies have confirmed that KMC can not only stabilize the vital signs of premature infants, and promote growth and development, but also can reduce their hospitalization cycle and mortality (Arya et al., 2021).

Previous studies have found that the KMC can play a certain role in regulating depression, irritability, and other negative emotions in postpartum mothers, it can be used not only to improve the maternal attachments in mothers with premature infants but also to reduce maternal anxiety and stress status after premature birth (Sinha et al., 2021).

2.3. Previous Studies

There are 13 studies included in the meta-analysis, which includes 891 babies in total. The studies showed that kangaroo mother care (KMC) was effective in maintaining the babies' ability to regulate their body temperature. A lower heart rate and a greater oxygen saturation level were noted in the premature babies after receiving KMC. It was also shown that the newborns' respiration rates dropped following KMC (Aysegul DURMAZ et al., 2023).

A 2020 study was conducted in Indonesia that included 30 premature babies which revealed that there are significant differences in variation in body temperature in premature babies and low birth weight babies with 95% of the participants showed increasing in body temperatures before KMC 36.0°C and 37.0°C after KMC, additionally, KMC significantly stabilize the respiratory rate of premature and low birth weight infants, also KMC showed a decrease in heart rate, before KMC it was 161 times per minute and after KMC it decreased to 138-152 times per minute, in relation to oxygen saturation KMC significantly increase oxygen saturation before KMC 95.5% and after KMC 98.3%, (Astuti & Novita, 2020).

Research conducted by (Rahman, 2019) which included 50 mothers, observed that 70% of the mothers had inadequate knowledge about kangaroo mother care.

Research published by (Omar, 2018), which included 50 mothers, discovered that 80% of mothers lacked appropriate knowledge about KMC practice.

Another study involving 363 mothers of preterm babies discussed three major factors associated with knowledge of KMC, only 138 postnatal moms (38%), knew enough about KMC. The mother's age (those over 30 were nearly four times more likely to have adequate knowledge compared to those under 20), education level (women with a secondary education and above were six times more likely to have adequate knowledge compared with those without formal education, and family type (nuclear mothers were 48% less likely to have adequate knowledge if compared with those living in extended families) were factors associated with knowledge on KMC (Chamhene & Moshi, 2023).

A study consisting of 60 mothers of preterm infants, concluded that Mothers' attitudes toward the usage of KMC were mostly positive. Thirty-nine moms (65%) thought their babies were safe during KMC, while twenty-one mothers (35%) thought the opposite. Furthermore, 39 respondents (65%) said that KMC was not tiring. The majority of the moms (75%) had a good perception, as shown by their happiness with KMC as well as their understanding of how to position the infant (Olawuyi et al., 2021).

Another study conducted in southern Malawi by (Nyondo-Mipando et al., 2021) reported that, even though kangaroo mother care was thought to be a simple intervention, mothers stated that it was challenging to implement regularly. Mothers receiving kangaroo mother care found it exhausting since they had to spend a lot of time in one position, had trouble sleeping, had limited movement, felt bored and alone while in the hospital, and received

inadequate assistance with necessities like eating made kangaroo mother care a taxing experience for moms.

"A study conducted in Fatemiyeh Hospital in Hamadan city, Iran reported that before KMC was implemented, there was no significant difference between the experimental and control groups neonate's physiological parameters (heart rate, respiration rate, arterial blood oxygen saturation, and temperature"). Nevertheless, following the KMC, there was a notable distinction concerning physiological indicators in the experimental group while no significant change was seen in the control group (Parsa et al., 2018).

2.4. Kangaroo Mother Care

Kangaroo care is a method of holding a baby that involves skin-to-skin contact. The baby, who normally wears only a diaper, is placed in an upright position against a parent's bare chest. Both mothers and fathers can do kangaroo care. It's often used with premature infants while they are still in the hospital. Kangaroo Mother Care is considered useful for nursing preterm and LBW infants. It provides infants with the basic needs for survival, like a mother's warmth, stimulation of breast milk, love, and protection. It became a very important way of caring for these high-risk infants. To achieve consistent temperature regulation and enhanced survival for these children, KMC is a cost-effective supplemental technique for caring for low birthweight (LBW) and preterm neonates. One of the World Health Organization's (WHO) 10 recommendations for treating preterm infants is KMC. Evidence-based research has demonstrated the effectiveness of KMC in decreasing preterm neonatal mortality and morbidity, avoiding infection and hypothermia, enhancing mother-infant connection, and lengthening the duration of exclusive breastfeeding. "Kangaroo Mother Care (KMC), also known as skin-to-skin care, refers to placing the newborn upright on the mother's (or father's) chest for the

desired warmth and security, named for the way marsupials such as kangaroos take care of their babies and toddlers".

To summarize, kangaroo care involves placing a baby in skin-to-skin contact with a parent's bare chest, typically used for premature infants in hospitals. Both mothers and fathers can practice kangaroo care. It provides warmth, stimulation for breastfeeding, love, and protection to the infant, proving crucial for their survival. Kangaroo Mother Care (KMC) is particularly beneficial for nursing preterm and low birthweight infants. It's a cost-effective method endorsed by the World Health Organization (WHO) for treating preterm infants. Evidence supports its effectiveness in reducing mortality and morbidity, preventing infections and hypothermia, promoting mother-infant bonding, and extending exclusive breastfeeding duration. Inspired by marsupials like kangaroos, KMC emphasizes warmth and security for newborns.

Chapter Three

(Methodology)

3.1. Introduction

The current study aims to evaluate the effectiveness of kangaroo mother care (KMC) on premature and low birth weight Infants in the NICU at Caritas Baby Hospital (CBH) and Holy Family Hospital in West Bank, Palestine. "This chapter will illustrate the concepts of methodology in this study. It includes a description of the research design, sampling and sample size, settings, and statistical analysis".

3.2. Study Design

The study is a quantitative, cross-sectional design.

3.3. Study Population and Setting

The population of this research study was all premature infants from the target hospitals, which was a total of 52 babies. Two hospitals that contain NICUs, specializing in premature and low birth weight infants. The two hospitals are Caritas Baby Hospital, and Holy Family Hospital both located in Bethlehem. Data collection was conducted at these hospitals to achieve the study aims/objectives.

3.4. Sample of the Study

"The sample type is convenience sampling in which infants meet inclusion criteria". In this study data was collected from all the premature and low birth weight infants from the targeted hospitals for a duration of six months, from September 2023 to March 2024, the total number of premature infants was 52.

3.5. Including Criteria

1. Neonatal birth age of 28 to 36 weeks of gestation.

2. Patients who are medically stable enough to leave the incubator and be with the mother (not sedated, with no invasive lines).
3. Infant weight at birth less than 2500 grams
4. The newborn has not undergone surgery.

3.6. Exclusion Criteria

1. Hemodynamically unstable (on invasive lines, inotropic treatments).
2. A highly infectious patient.
3. Who is >37 weeks
4. Baby outside the neonatal ICU.
5. Infants with chest drains.
6. Unstable with ventilation respiratory support such as HFOV.
7. Post of any major procedures or treatment.
8. Any infant who has had an acute or sudden deterioration.
9. Maternal illness or complications preventing her from caring for her baby.
10. Decline parental consent before or during the study.

3.7. Data Collection and Procedure / Data Record

Instrument

This study involved the use of a questionnaire that was designed by the researcher and revised by the supervisor after a critical review of the literature. It is divided into the following six parts:

Part (1): Socio-demographic variables, which include:

Gestational age, Weight/ birth, Current weight, Gender, and Anthropometric measurement.

Part (2): Health and medical characteristics of the neonate, which include:

Mode of the delivery, medical complications during hospital stay, Exclusive breastfeeding, Days of stay in NICU, and APGAR Score.

Part (3): Vital signs of the neonate before and after KMC, which includes:

Heart rate, respiratory rate, temperature, and O2 saturation.

Part (4): Assessment of the mothers regarding KMC, includes:

When KMC started, Duration of KMC done per sitting, and is the environment conductive for a preterm baby?

Part (5). Mothers' knowledge regarding KMC practices:

"Composed of eight multiple choice questions. The correct answer scored 1 and the incorrect scored 0. The knowledge scores were converted into percentage scores by dividing the respondents' results by the potential maximum scores and multiplying by 100. The total score of each result was calculated using Bloom's cutoff point (Blooms, 1956). The degree of knowledge was categorized into three categories based on the aggregate scores: low-level knowledge (less than 60%), moderate-level knowledge (60-79%), and high-level knowledge (80-100%)".

Part (6): satisfaction levels of mothers regarding Kangaroo Mother Care (KMC) practices: "composed of six items rated using the Likert scale from disagree (1) to strongly agree (4).

The satisfaction scores were converted into percentage scores by dividing the respondents' results by the potential maximum scores and multiplying by 100. The total score of each result was calculated using Bloom's cutoff point (Blooms, 1956). The degree of satisfaction was categorized into three categories based on the aggregate scores: poor-level satisfaction (less than 60%), fair-level satisfaction (60-79%), and high-level satisfaction (80-100%)".

A. Data collection procedure

B. "The researcher approached the mothers of the premature who fulfilled the inclusion criteria. After obtaining the participation informed consent of infants' mothers who were willing to participate in the study, demographic data were collected by a questionnaire, an attempt of KMC takes approximately 30 minutes, during which the nurse would assess the babies' physiologic parameters such as (heart rate, respiratory rate, oxygen saturation, desaturations, body temperature) before and after the procedure, first, mothers got bathing, wearing a special KMC blanket, and perform KMC. With the help of the nursing staff, the neonate was placed between the mother's breasts. The room temperature was kept between 26-29°C".

C. Measuring the effectiveness of KMC. In this study phase, the effectiveness of KMC implementation was evaluated using a before-and-after comparison with two measures. The physiological parameters of the infant were measured following 30 minutes of KMC practice and recorded in the checklist.

D. Also, the mothers answered the knowledge part and filled in the satisfaction part of the questionnaire.

E. The questionnaire was filled with Arabic language face-to-face interaction.

3.8. Validity of Questionnaire Form

The questionnaire form was established by the researcher to accomplish the study objectives, the investigator ensured the face validity twice. The first time was through experts who gave their suggestions for improvement and judgment about the adequacy and accuracy of the checklist form. The second is by a pilot study.

Content validity was done before data collection, by sending the checklist form with covering letter concerning the study and study proposal to experts who are experts in the

field, they were asked to estimate and revise the items in the checklist in terms of sufficiency of the checklist in relation to study, accuracy, and its relevancy.

Feedback was obtained from experts and modification accordingly was done by the researcher and supervisor; their opinion was taken into consideration.

3.9. Ethical Consideration

Ethical approval was attained from the Arab American University Palestine (AAUP), Caritas Baby Hospital Research Committee, as well as Holy Family Hospital before beginning data collection. Consent presented information concerning the study purpose, clarification that there are no risks or threats to participation, a short explanation of the study objectives, describing how the data should be kept secret.

3.10. Pilot Study

A pilot study was conducted on 10% of the sample. Approximately 5 babies (they were chosen randomly) were excluded from the study sample. Some concepts have been corrected, some questions have been clarified, and some have been canceled, according to experts' consulting to achieve the objectives of the study.

3.11. Data Analysis

All provided information was considered confidential and the researcher undertakes the obligation not to reveal any information from the data record. After completing all data records, statistical analysis was performed to achieve study objectives. The collected data via the questionnaire form was processed with the help of IBM-Statistical Package for the Social Sciences (SPSS) v23. The statistical tests included an independent t-test and ANOVA was used to test the differences between the variables.

Chapter Four

(Results)

4.1. Introduction

This chapter focuses on the examination of gathered data for analysis purposes. Utilizing statistical techniques, the researcher was able to infer, scrutinize, organize, quantify, assess, and communicate numerical data effectively. The objective of this analysis is to address inquiries pertinent to the study. The approach to data analysis is tailored to the research questions, design, data collection methods, and the scale of measurement used. In this chapter, the data undergoes editing, tabulation, analysis, and interpretation processes.

4.2. Reliability of the Study Scales

Cronbach's Alpha of all scales was above 0.70, indicating acceptable internal consistency or homogeneity for the questionnaire, as seen in 4-1.

Table 4 -1. Cronbach's Alpha of the scales

Scale	**Item**	**Cronbach's Alpha**
Knowledge	8 questions	0.78
Satisfaction	6 questions	0.88

4.2 Participants' Characteristics

The data was completed with 52 neonates and their mothers participated in the current study. Gestational age distribution reveals that the majority fall within the 34–36-week range 20 (38.5%), followed by 30-31 weeks 13 (25.0%). In terms of birth weight, a notable proportion weighs over 1500 grams 26 (50.0%), with a significant minority falling below 1000 grams 12 (23.1%). Current weight distribution indicates a relatively balanced spread, with 1500-2000 grams being the most prevalent 16 (30.8%). Gender distribution shows a slight male predominance, with males comprising 35 (67.3%) of the

sample. Anthropometric measurements present mean values of 40.5±5.6 cm for length and 29.6±3.5 cm for head circumference, as seen in (Table 4-2)

Table 4-2. Demographic and anthropometric characteristics of the neonates (N=52)

Variable		**N (%)**	**M(SD)**
Gestational age	26-27	10(19.2)	
	28-29	6(11.5)	
	30-31	13(25.0)	
	32-33	3(5.8)	
	34-36	20(38.5)	
Weight/ birth	< 1000 gram	12(23.1)	
	1000-1500 gram	14(26.9)	
	> 1500 gram	26(50.0)	
Current weight	< 1000 gram	8(15.4)	
	1000-1500 gram	13(25.0)	
	1500 -2000 gram	16(30.8)	
	> 2000 gram	15(28.8)	
Gender	Male	35(67.3)	
	Female	17(32.7)	
Anthropometric measurement	Length		40.5(5.6)
	Head circumference		29.6(3.5)

According to hospitals, the analysis revealed that 28 (53.8%) of the participants were from Holy Family Hospital and 24 (46.2%) from Caritas Baby Hospital in Bethlehem, as seen in Figure 4-1.

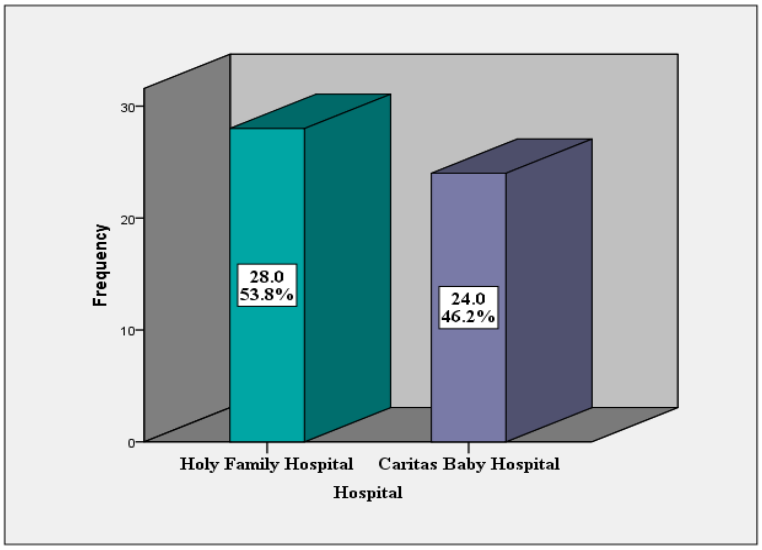

Figure 4-1. Distribution of the participants according to the hospital (N=52)

4.3. Demographic and medical characteristics of the neonate

Regarding the mode of delivery, the majority underwent lower segmental cesarean section 34 (65.4%), while normal delivery accounted for 16 (30.8%). Medical complications during the hospital stay were predominantly neonatal respiratory distress syndrome (NRDS) affecting 39 (75.0%) of the neonates, followed by necrotizing enterocolitis/sepsis 5 (9.6%). Exclusive breastfeeding was reported in 16 (30.8%) of cases. The length of stay in the Neonatal Intensive Care Unit (NICU) varied, with 30 (57.7%) requiring 0-14 days, and 22 (42.3%) staying for more than 14 days. A majority of neonates 37(71.2%) had favorable APGAR scores of 7-10, indicating overall good condition at birth, while 15 (28.8%) scored 4-6, suggesting some degree of perinatal distress, as seen in (Table 4-3).

Table 4-3. Health and medical characteristics of the neonate (N=52)

Variable		**N (%)**	**M(SD)**
Mode of the delivery	Normal delivery	16(30.8)	
	Lower segmental cesarean section	34(65.4)	
	Forceps delivery	1(1.9)	
	Normal delivery with episiotomy	1(1.9)	

Medical complications during hospital stay	NRDS	39(75.0)	
	BPD	4(7.7)	
	NEC/Sepsis	5(9.6)	
	Apnea	4(7.7)	
Exclusive breastfeeding	Yes	16 (30.8)	
	No	36 (69.2)	
Days of stay in NICU	0-14 days	30 (57.7)	
	> 14 days	22 (42.3)	
APGAR Score	4-6	15(28.8)	
	7-10	37(71.2)	

Before KMC initiation, neonatal heart rate averaged 151.6 beats per minute (SD=14.4), while after 30 minutes of KMC, it decreased to 141.6 beats per minute (SD=13.4), indicating a reduction in heart rate post-KMC. The respiratory rate also exhibited a decrease from an average of 52.5 breaths per minute (SD=10.0) before KMC to 45.3 breaths per minute (SD=8.7) after 30 minutes of KMC, suggesting a positive effect on respiratory function. The temperature remained relatively stable, with a slight elevation from 36.7°C (SD=0.3) before KMC to 36.9°C (SD=0.2) after KMC. Oxygen saturation levels showed improvement, with an average increase from 95.2% (SD=2.8) before KMC to 97.2% (SD=2.0) after KMC, indicating enhanced oxygenation, as seen in Table (4-4). These findings highlight the potential benefits of KMC in stabilizing vital signs and promoting physiological well-being in neonates, supporting its utility as an adjunctive care measure in neonatal healthcare settings.

Table 4-4. Vital signs of the neonate before and after KMC (N=52)

Vital sign	Before KMC	After 30 minutes of KMC
Heart rate	151.6(14.4)	141.6(13.4)
Respiratory rate	52.5(10.0)	45.3(8.7)
Temperature	36.7(0.3)	36.9(0.2)
O2 Saturation	95.2(2.8)	97.2(2.0)

The timing of KMC initiation varied, with 15 (28.8%) of mothers starting KMC within less than 7 days after birth, 18 (34.6%) within 7-14 days, and 19 (36.5%) initiating it more than 14 days postpartum. Regarding the duration of KMC per session, 30 (57.7%) of mothers practiced KMC for less than 30 minutes, while 22 (42.3%) extended the duration to more than 30 minutes per sitting. A majority of mothers 38 (73.1%) perceived the environment as conducive for their preterm baby during KMC sessions while 14 (26.9%) of mothers expressed concerns about the environment, as seen in (Table 4-5).

Table 4-5. Assessment of the mothers regarding KMC (N=52)

Variable		N (%)
When KMC started	Less than 7 days	15(28.8)
	7-14 days	18(34.6)
	More than 14 days	19(36.5)
Duration of KMC done per sitting	Less than 30 minutes	30(57.7)
	More than 30 minutes	22(42.3)
Is the environment conductive for preterm baby	Yes	38(73.1)
	No	14(26.9)

4.4. Testing the research questions

Research question one: What are the knowledge levels of mothers regarding Kangaroo Mother Care (KMC) practices in the Neonatal Intensive Care Units (NICUs) at Holy Family Hospital and Caritas Baby Hospital?

The analysis of knowledge levels reveals that 8(15.4%) of mothers exhibited a low level of knowledge about KMC, while a larger proportion, constituting 30 (57.7%), demonstrated a moderate level of knowledge. Conversely, 14 (26.9%) of mothers possessed a high level of understanding regarding KMC practices, as seen in (Table 4-6).

Table 4-6. Description of the mothers' knowledge regarding KMC practices (N=52)

Variable		N	(%)
Knowledge	Low knowledge level	8	15.4
	Moderate knowledge level	30	57.7
	High knowledge level	14	26.9

N= sample; %= percentage

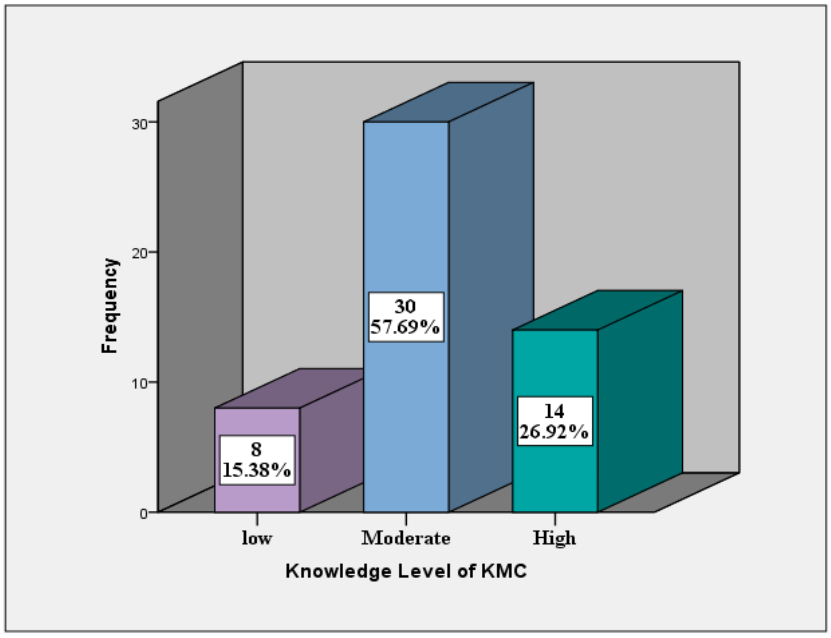

Figure 4-2. Distribution of the mothers according to the knowledge level of KMC (N=52)

According to questions of knowledge analysis, the majority of respondents accurately recognized the benefits of KMC, with 40 (80.8%) acknowledging its role in increasing maternal milk supply, and 48 (92.3%) acknowledging its promotion of quiet sleep-in babies. Additionally, 45 (86.5%) correctly understood that KMC does not increase the risk of infection for preterm babies, and 47 (90.4%) recognized that babies do not appear to be in pain during KMC. However, the level of awareness varied for specific aspects of KMC implementation. Only 7 (13.5%) correctly identified the position used in KMC, while 19 (36.5%) knew how to prepare the baby for KMC. Nevertheless, a significant proportion of 45 (86.5%) understood how to monitor the baby during KMC, and 40 (76.9%) recognized indicators of the baby's well-being, as seen in (Table 4-7).

Table 4-7. Distribution of the answers regarding mothers' knowledge of KMC practice (N=52)

Question	Correct
	N(%)
KMC increases the baby's mother's milk supply	42(80.8)
KMC promotes quiet sleep	48(92.3)
KMC increases the risk of infection for preterm babies	45 (86.5)
Babies appear to be not in pain during KMC	47(90.4)
Which position was used in Kangaroo Mother Care?	7(13.5)
How do prepare a baby while doing kangaroo mother care?	19(36.5)
How should a monitored Baby while receiving kangaroo mother care?	45(86.5)
What is the indicator that the baby is well?	40(76.9)

Research question two: What are the satisfaction levels of mothers regarding Kangaroo Mother Care (KMC) practices in the Neonatal Intensive Care Units (NICUs) at Holy Family Hospital and Caritas Baby Hospital?

The analysis revealed that a significant majority of mothers, comprising 30 (57.7%), reported a high level of satisfaction with KMC. Conversely, 22 (42.3%) expressed a fair satisfaction level, as seen in (Table 4-8). This indicates a predominantly positive perception of KMC among mothers, emphasizing its value and effectiveness in meeting their needs and expectations.

Table 4-8. Description of the mothers' satisfaction regarding KMC (N=52)

Variable		N	(%)
Mothers' Satisfaction of KMC	Fair satisfaction level	22	42.3
	High satisfaction level	30	57.7

N= sample; %= percentage

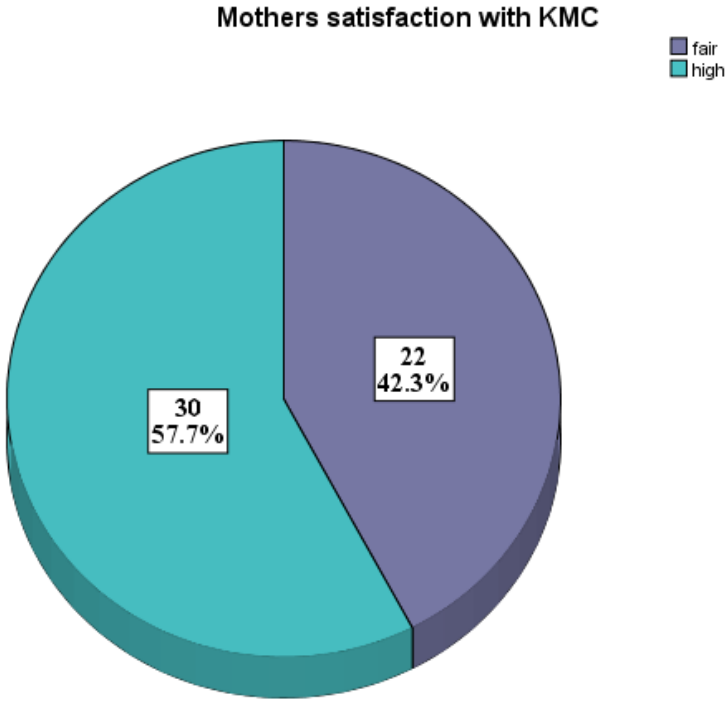

Figure 4-3. Distribution of the mothers according to satisfaction of KMC (N=52)

Research question three: Are there significant differences between mothers' knowledge of Kangaroo Mother Care (KMC) practices and their satisfaction scores, in relation to the duration of their neonates' stay in the Neonatal Intensive Care Units (NICUs) at Holy Family Hospital and Caritas Baby Hospital?

The analysis of mothers' knowledge and satisfaction regarding Kangaroo Mother Care (KMC) in Neonatal Intensive Care Units (NICUs) based on the duration of stay in NICU, categorized as 0-14 days and more than 14 days present in (Table 4-9). An independent t-test was conducted to assess the significance of differences between the two groups, with corresponding p-values reported.

For knowledge of KMC, the mean score for mothers with neonates staying 0-14 days in NICU was 72.1 (SD=15.0), whereas, for those with neonates staying more than 14 days, the mean score was slightly lower at 65.4 (SD=14.6). However, the difference was not statistically significant (t=1.409, p=0.165), suggesting that the duration of NICU stay did not have a significant impact on mothers' knowledge of KMC.

In contrast, regarding satisfaction with KMC, mothers with neonates staying 0-14 days in NICU reported a higher mean satisfaction score of 83.8 (SD=6.6), compared to those with neonates staying more than 14 days, whose mean satisfaction score was slightly lower at 78.2 (SD=4.9). The difference in satisfaction scores was statistically significant (t=2.783, p=0.008), indicating that mothers with shorter NICU stays tended to have higher satisfaction levels with KMC compared to those with longer NICU stays.

Table 4-9. Differences between mothers' knowledge and satisfaction of KMC in NICUs and days of stay in NICU (N=52)

Variable	Days of stay in NICU		Statistical test	
			T-test	P value
	Days	>14 days		
	M(SD)	M(SD)		
Knowledge	72.1(15.0)	65.4(14.6)	1.409	.165
Satisfaction	83.8(6.6)	78.2(4.9)	2.783	.008**

**Significant at the 0.05 level.*
***Significant at the 0.05 level.*

Research question four: Are there significant differences between mothers' knowledge of Kangaroo Mother Care (KMC) practices and their satisfaction scores, in relation to the current weight of their babies in the Neonatal Intensive Care Units (NICUs) at Holy Family Hospital and Caritas Baby Hospital?

The analysis of mothers' knowledge and satisfaction regarding Kangaroo Mother Care (KMC) in Neonatal Intensive Care Units (NICUs) based on the current weight of their babies present in (Table 4-10) by using the ANOVA test. The mean knowledge scores for mothers with babies in each weight category ranged from 68.3 to 72.1, with no significant difference observed across the groups (F (0.154), p = 0.927).

In terms of satisfaction with KMC, mothers' mean satisfaction scores varied slightly across the weight categories, ranging from 79.7 to 85.0. However, the result did not reveal a statistically significant difference in satisfaction levels based on the current weight of the baby (F (1.419), p = 0.249).

Table 4-10. Differences between mothers' knowledge and satisfaction of KMC in NICUs and Current weight of the baby (N=52)

Variable	Current weight of the baby				Statistical test	
					F test	P value
	< 1000 gram	1000-1500 gram	1500 - 2000 gram	> 2000 gram		
	M(SD)			M(SD)		
Knowledge	70.3(18.8)	72.1(11.6)	71.1(13.5)	68.3(18.2)	.154	.927
Satisfaction	79.7(4.7)	81.1(7.1)	82.3(6.5)	85.0(6.8)	1.419	.249

**Significant at the 0.05 level.*
***Significant at the 0.05 level.*

Research question five: Are there significant differences in vital signs before and after Kangaroo Mother Care (KMC) practices among neonates in the Neonatal Intensive Care Units (NICUs) at Holy Family Hospital and Caritas Baby Hospital?

The analysis highlights significant improvements in vital signs following just 30 minutes of KMC, as seen in (Table 4-11). Before KMC initiation, the mean heart rate was 151.6 beats per minute (SD=14.4), which significantly decreased to 141.6 beats per minute (SD=13.4) after KMC, as evidenced by a t-test yielding a p-value of 0.001. Similarly, the respiratory rate exhibited a noteworthy decrease from 52.5 breaths per minute (SD=10.0) before KMC to 45.3 breaths per minute (SD=8.7) after KMC, with a significant p-value of 0.001. Interestingly, while the temperature showed a slight increase from 36.7°C (SD=0.3) to 36.9°C (SD=0.2) after KMC, the difference was statistically significant (p = 0.001), suggesting a potential regulatory effect of KMC on neonatal temperature. Moreover, oxygen saturation levels notably improved, with a mean increase from 95.2% (SD=2.8) before KMC to 97.2% (SD=2.0) after KMC, with a significant p-value of 0.001. These findings underscore the immediate and beneficial impact of KMC on neonatal

physiological stability, highlighting its effectiveness in promoting vital signs and overall well-being in this vulnerable population.

Table 4-11. Vital signs of the neonate before and after KMC (N=52)

Vital sign	Before KMC	After 30 minutes of KMC	t. test	p. value
Heart rate	151.6(14.4)	141.6(13.4)	8.498	0.001**
Respiratory rate	52.5(10.0)	45.3(8.7)	7.421	0.001**
Temperature	36.7(0.3)	36.9(0.2)	-6.184	0.001**
O2 Saturation	95.2(2.8)	97.2(2.0)	-8.006	0.001**

**Significant at the 0.05 level.*
***Significant at the 0.05 level.*

Chapter Five

(Discussion)

5.1. Introduction

One major factor contributing to newborn mortality is preterm delivery. Worldwide, Kangaroo Mother Care is becoming essential to the treatment of premature and low birth weight infants. Numerous studies have revealed that KMC has positive effects on newborns and mothers. Results of this study showed that there is a statistically significant difference before and after KMC concerning physiological parameters (oxygen saturation, heart rate, respiratory rate, and Temp). These results agreed with those of (Aysegul DURMAZ et al., 2023, Astuti & Novita, 2020 and Parsa et al., 2018) who reported that there is a significant difference between pre-and post-application of KMC regarding premature neonates' physiological outcomes.

According to questions of knowledge analysis in this study, (15.4%) of mothers exhibited a low level of knowledge about KMC, while a larger proportion, constituting (57.7%), demonstrated a moderate level of knowledge. Conversely, (26.9%) of mothers possessed a high level of understanding regarding KMC practices. Mothers also exhibit a good knowledge regarding increasing maternal milk supply, and promotion of quiet sleep in premature babies understanding that KMC does not increase the risk of infection for preterm babies and that babies do not appear to be in pain during KMC. These results are inconsistent with research conducted by both (Rahman, 2019, Omar, 2018) this right citation discovered that 70-80% of mothers lacked appropriate knowledge about KMC practice. Nevertheless, in the context of this research, mothers in our NICUs are unfamiliar with the idea of KMC, and the researcher did not provide them with any

education before the practice. However, throughout the KMC session, mothers observed improvements in their babies in relation to the knowledge questions.

Our study reported a high level of satisfaction with KMC. This indicates a predominantly positive perception of KMC among mothers, emphasizing its value and effectiveness in meeting their needs and expectations. This is inconsistent with Nyondo-Mipando et al., 2021 which stated that it was challenging to implement regularly. Mothers receiving KMC found it exhausting since they had to spend a lot of time in one position, had trouble sleeping, had limited movement, felt bored and alone while in the hospital, and received inadequate assistance with basic necessities. Whereas the mothers in this study noted that their babies had improved in terms of knowledge questions such as increasing their milk supply and promoting quiet sleep, which contributed to the high level of satisfaction. Also, Mothers felt that they accomplished something special for their babies because mothers were bonding with their babies for the first time

5.2. Limitations of the Study

The study's limitations include the fact that a mother's practice of KMC is influenced by social, resourcing, and experiential factors; these issues include the ongoing war's effect on the mothers' ability to transport and apply KMC. Furthermore, the lack of privacy is brought on by inadequate locations and restricted space. Moreover, a small sample size may have limited the thesis, which might have reduced the findings' generalizability and statistical power of the findings. A limited sample size can also raise the possibility of type II errors, which occur when there is not enough data to identify the true effects. Finally, the lack of funding for scientific research and time limitations were recognized as study limitations.

5.3. Recommendations and Future Work

1. Training for Healthcare Practitioners: To improve the knowledge and abilities of healthcare practitioners in providing KMC, create and implement thorough training programs. KMC procedures, optimal techniques for skin-to-skin contact, assistance with breastfeeding, and monitoring of baby health outcomes need to be included in the training.
2. Parent Education and Support: To assist parents become more knowledgeable and comfortable with KMC, provide them with programs that will educate and encourage them. Provide parents with equipment, support groups, and counseling to assist them get over obstacles and difficulties related to implementing KMC.
3. Integration with Standard Care: To guarantee consistency throughout healthcare facilities, involve KMC in standard newborn care protocols and standards. Encourage healthcare organizations to implement KMC as an everyday practice for preterm and low birth weight babies, with sufficient equipment and facilities to support it. May 15 is the day to celebrate Kangaroo Care Day Worldwide, in this day the researcher will raise awareness of KMC and its importance in maintaining the outcome for preterm babies.
4. Monitoring and Evaluation: To evaluate the effectiveness of KMC programs and their implementation, establish set-up procedures for monitoring and evaluation. To identify areas that need improvement, track important performance indicators (such as breastfeeding rates and mortality rates), and continually assess the health outcomes of infants. The necessity of implementing preventive health programs, particularly among risky groups.

5. Encourage more studies on KMC to fill up any knowledge and practical gaps that might yet exist. Encourage research on KMC through a variety of demographics, environments, and circumstances to improve knowledge of its efficacy, viability, and sustainability.
6. Incorporating kangaroo care into the university curriculum because of its significance for preterm babies' health. As well, hospitals that treat preterm newborns should develop strategies to address this as part of the care treatment they deliver.

By incorporating these recommendations into the thesis, the researcher can contribute to the advancement of KMC initiatives and ultimately improve outcomes for preterm and low birth weight infants and their families.

5.4. Conclusion

In conclusion, this thesis has examined the different aspects of Kangaroo Mother Care (KMC) and the way it affects the connection between mothers and their infants as well as the health of the newborn. A thorough examination of the literature and an analysis of the empirical data have produced several significant findings. A large amount of evidence supports KMC's efficacy in improving outcomes for preterm newborns. Research continuously shows how KMC improves breastfeeding rates, lowers mortality rates, maintains physiological stability, and strengthens the connection between mothers and infants. These results highlight the significance of KMC as an evidence-based and cost-effective intervention for enhancing newborn health outcomes, especially in areas with limited resources. There are challenges regarding its adoption and implementation that need to be overcome. Cultural beliefs and traditions, logistical obstacles in healthcare facilities, and a lack of awareness and understanding among healthcare practitioners and

families are some of the factors that might affect the uptake and sustainability of KMC programs. To sum up, this thesis adds to the existing data of research on KMC and emphasizes how crucial it is for enhancing newborn health and increasing the quality of care. Let's stay dedicated to improving KMC's application and efficacy as we pursue excellence in neonatal care to ensure the greatest results for our tiniest and most vulnerable infants.

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Appendices

Appendix A/Data Record

	Distribution of The Newborn	
	Gestational Age (Weeks) - 26-28 - 28-30 - 30-32 - 32-34 - 34-36	
	Weight at birth (grams)	
	Current weight of the Baby - 700 g -1000 Kg - 1000 Kg - 1.500 Kg - 1.500 Kg - 2 Kg - > 2 Kg	
	Sex - Male - Female	
	Anthropometry - Length (cm) - Head circumference (cm)	
	Type of delivery - Normal delivery - Lower segmental Cesarean Section - Forceps delivery - Normal delivery with episiotomy	
	Medical complications during hospital stay - NRDS - BPD - NEC/sepsis - Apnea	
	Exclusive Breastfed - Yes - No	
	Days of stay in NICU - 0 − 14 days - > 14 days	
	Apgar score - 0-3 - 4-6 - 7-10	

	Vital Signs	
1.	Vital signs measured before and after 30 minutes of kangarooing - HR/minute Before KMC	
	After KMC	
2.	Vital signs measured before and after 30 minutes of kangarooing - RR/minute Before KMC	
	After KMC	
3.	Vital signs measured before and after 30 minutes of kangarooing - Temperature Before KMC	
	After KMC	
4.	Vital signs measured before and after 30 minutes of kangarooing - Blood Pressure Before KMC	
	After KMC	
5.	Vital signs measured before and after 30 minutes of kangarooing - Saturation Before KMC	
	After KMC	

	Kangaroo Mother Care	
	When KMC was started - <7 days - 7 – 14 days - >14 days	
	Duration of KMC done per sitting - < 30 minutes - > 30 minutes	
	KMC increases the baby's mother's milk supply - Yes - No	
	KMC promotes quiet sleep - Yes	

	- No	
	KMC increases the risk of infection for preterm babies - Yes - No	
	Babies appear to be not in pain during KMC - Yes - No	
	Is the environment conductive for KMC? - Yes - No	
	Which position was used in Kangaroo Mother Care? - Sitting and standing position - Supine position - Prone position - Sitting, standing, and sleeping positions	
	How do prepare a baby while doing kangaroo mother care? - Naked - Wearing cloth - Wearing only diaper - Wearing a cap, diaper, and socks	
	How should a monitored Baby while receiving kangaroo mother care? - Neck position - Airway clearances - Body color - All of the above	
	What is the indicator that the baby is well? - Neck not too flexed, not too extended - Head is fixed - Neck turn one side - Foot flexed	

Patient satisfaction scores (The Mother)

	Statements	Disagree	Strongly Disagree	Agree	Strongly agree
1.	- I loved Kangaroo care and found it made an enormous difference in helping me care for my baby				
2.	- I quite liked Kangaroo care and found it quite helpful in helping me care for my baby				
3.	- Neutral feelings (neither like or disliked)				
4.	- I did not particularly like doing Kangaroo care and did not find it helpful in caring for my baby				
5.	- I strongly disliked doing Kangaroo care.				
6.	- It was very unhelpful and I would never recommend it to anyone else				

Appendix B/ Ethical Approval

Arab American University
Institutional Review Board - Ramallah

الجامعة العربية الأمريكية
مجلس اخلاقيات البحث العلمي – رام الله

IRB Approval Letter

Study Title: "The Effectiveness of Kangaroo Mother Care (KMC) On Premature and Low birth Weight Infants in the NICU at Caritas Baby Hospital (CBH) and Holy Family Hospital in West Bank, Palestine"

Submitted by: Rania Khaled Boutros Bannoura

Date received: 5th January 2024

Date reviewed: 12th January 2024

Date approved: 4th February 2024

Your Study titled **"The Effectiveness of Kangaroo Mother Care (KMC) On Premature and Low birth Weight Infants in the NICU at Caritas Baby Hospital (CBH) and Holy Family Hospital in West Bank, Palestine"** with the code number **"R-2024/A/17/N"** was reviewed by the Arab American University Institutional Review Board - Ramallah and it was approved on the 4th of February 2024.

Sajed Ghawadra, PhD
IRB-R Chairman
Arab American University of Palestine

الجامعة العربية الأمريكية - فلسطين
مجلس اخلاقيات البحث العلمي - رام الله
IRB-R
ARAB AMERICAN UNIVERSITY-PALESTINE
INSTITUTIONAL REVIEW BOARD - RAMALLAH

General Conditions:

1. Valid for 6 months from the date of approval.
2. It is important to inform the IRB-R with any modification of the approved study protocol.
3. The Bord appreciates a copy of the research when accomplished.

الملخص

العنوان:

فعالية رعاية الكنغرو على الأطفال الخدج في وحدة العناية المركزة لحديثي الولادة في مستشفى كاريتاس للأطفال ومستشفى العائلة المقدسة في الضفة الغربية، فلسطين.

مقدمة: تعتبر الولادة المبكرة أكبر سبب مباشر لوفيات واعتلال الولادة. رعاية الكنغر (ملامسة الجلد للجلد) هي أبسط تدخل يمكن أن يحصل عليه الطفل وأكثرها فعالية من حيث التكلفة ومنقذة للحياة، وبدء رعاية الأم على طريقة الكنغر مباشرة بعد الولادة لديه القدرة على إنقاذ ما يصل إلى 150000 شخص إضافي كل عام. تحسن رعاية الأم على طريقة الكنغر بشكل كبير من فرص بقاء الطفل الخديج أو منخفض الوزن عند الولادة.

الهدف: تقييم فعالية رعاية الأم على الكنغر على الأطفال الخدج ومنخفضي الوزن عند الولادة في وحدة العناية المركزة لحديثي الولادة في مستشفى كاريتاس للأطفال ومستشفى العائلة المقدسة في الضفة الغربية، فلسطين.

المنهجية: تم تضمين مجموعه من 52 رضيعا خديجا في هذه الدراسة من مستشفى كاريتاس للأطفال ومستشفى العائلة المقدسة في الضفة الغربية، فلسطين. تم الحصول على بيانات المريض ومعالجتها بسرية عبر الاستبيانات.

النتائج: وتظهر نتائج الدراسة الحالية، التي شملت 52 من حديثي الولادة وأمهاتهم، المزايا المحتملة لرعاية الكنغر في تعزيز الرفاهية الفسيولوجية وتثبيت العلامات الحيوية لدى حديثي الولادة، وبالتالي تأييد قيمته كإجراء رعاية مساعد في أماكن الرعاية الصحية لحديثي الولادة.

الخلاصة: لقد ثبت أن رعاية الكنغر يؤثر بشكل إيجابي على جميع المعلمات الفسيولوجية لحديثي الولادة الخدج وهو ضروري لتحسين الاتصال بين الأم والطفل والتحكم في نمط النوم.

كلمات أساسية (مفاتيح): فلسطين، رعاية الأم الكنغر، فعالية رعاية الكنغر، العناية المركزة لحديثي الولادة، الأطفال الخدج، الرضع منخفضي الوزن عند الولادة، الإجهاد الفسيولوجي.