FACTORS ASSOCIATED WITH THE DELAY IN THE INITIATION OF BREASTFEEDING TO PREMATURE INFANTS BEFORE DISCHARGE FROM HOSPITAL

by

EDNA JEANETTE SIBANYONI

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at the

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SUPERVISOR: PROF. LM MODIBA

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Student number:5376416

DECLARATION

I declare that **FACTORS ASSOCIATED WITH THE DELAY IN THE INITIATION OF BREASTFEEDING TO PREMATURE INFANTS BEFORE DISCHARGE FROM HOSPITAL** is my own work and that the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

07 February 2020

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SIGNATURE **DATE**

EDNA JEANETTE SIBANYONI

FACTORS ASSOCIATED WITH THE DELAY IN THE INITIATION OF BREASTFEEDING TO PREMATURE INFANTS BEFORE DISCHARGE FROM HOSPITAL

STUDENT NUMBER: **5376416**
STUDENT NAME: **EDNA JEANETTE SIBANYONI**
DEGREE: **MASTER OF ARTS**
DEPARTMENT: **HEALTH STUDIES, UNIVERSITY OF SOUTH AFRICA**
SUPERVISOR: **PROF LM MODIBA**

ABSTRACT

The purpose of the study was to identify factors associated with the delay in the initiation of breastfeeding to premature infants before discharge from hospital. The need for this research is evident in the current practice of feeding premature infants after a nasogastric tube is removed. The study sought to provide answers to delayed initiation of breastfeeding to premature infants before discharge from hospital. Fifty members of staff in the Sick Neonate Unit and 50 mothers of premature infants participated in the study. Self-administered data collection instruments were used to collect data from mothers of premature infants and staff of a Sick Neonate Unit in the hospital.

The results showed that sociodemographic factors of staff 15 (f=30%) were 31-40 years old, and young nursing staff have decreased knowledge of breastfeeding as compared to senior and older staff members. Maternal demographic factors 36 (f=73.5%) were single and 13 (f=26.5) were married. Married mothers were more likely to breastfeed with the support of the partner than unmarried mothers. Health service factors staff views towards breastfeeding were 11(f=22.0% staff members were neutral about breastfeeding, and Eighteen (f=36.0%) staff members strongly disagreed to other methods of infant feeding. Maternal breastfeeding knowledge was one of the factors under maternal breastfeeding factors because it showed that 48 mothers (f=98.0%) did not have breastfeeding knowledge. Descriptive statistics were used to analyse data.

The study findings indicated that staff breastfeeding knowledge should be improved, and this will enable them to change their view of breastfeeding and initiating breastfeeding to premature infants. Maternal breastfeeding knowledge can be increased through support and assistance provided by staff and family members.

KEY CONCEPTS

Prematurity, premature infant, nasogastric tube feed, initiation of breastfeeding, hospital discharge.

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“Because you are my help, I sing in the shadow of your wings.” Psalm 63:7

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DEDICATION

To Tshiamo and Keorapetse

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
DVD	Digital Video Disk
E/N	Enrolled Nurse
E/N/A	Enrolled Nursing Auxiliary
HIV	Human Immunodeficiency Virus
IBM	International Business Machines
KMC	Kangaroo Mother Care
NEC	Necrotizing Enterocolitis
NICU	Neonatal Intensive Care Unit
NNS	Non- nutritive sucking
RN	Registered Nurse
RN & M	Registered Nurse and Midwife
RN/ CS	Registered Nurse in Community Service
SDG	Sustainable Development Goal
SNU	Sick Neonate Unit
SPSS	Statistical Package for Social Sciences
STS	Skin-to-skin
UNICEF	United Nations Children's Fund
WHO	World Health Organisation

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION AND BACKGROUND

In premature infants, beneficial effects of human milk generally relate to improvements in host defences, digestion and absorption of nutrients, gastrointestinal function, neurodevelopmental outcomes and maternal psychological well-being (Zachariassen, Faerk, Grytter, Esberg, Juvonen & Halken 2010:1000). Breastfeeding of premature infants provides a broad multifactorial and anti-inflammatory defence for the infant (Zachariassen, Faerk, Grytter, Esberg, Juvonen & Halken 2010:1000).

Among developed and industrialised countries, Sweden has one of the highest durations and rates of breastfeeding (Nyqvist & Kylberg 2013:307). According to Flacking, Ewald and Wallim (2011:1129), the breastfeeding regime at the neonatal unit has its focus on breastfeeding and mothers are expected to continue breastfeeding. A study done by Flacking et al. (2011:1128) found that mothers described the breastfeeding process as a training camp connected with routines such as scheduled feeding and weighing of their preterm infants, but also as an action in which they felt necessary for their babies. Breastfeeding was also described by Boucher, Brazal, Certosini, Sherrard and Feeley (2011:25) and Wright and Edginton (2016:12) as an opportunity to feel close to the baby and to form an attachment to the baby**.**

The New Ten Steps Guidance to Breastfeeding issued on 11 April 2018 by the WHO and UNICEF to increase support for breastfeeding in health facilities that provide maternity and new-born services. Breastfeeding all babies for the first two years would save the lives of more than 820,000 children under age of five years annually. These steps provide the immediate health system platform to help mothers initiate breastfeeding within the first hour and breastfeed exclusively for six months.

WHO Director-General Dr Tedros Adhanom Ghebreyesus indicated that in many hospitals and communities around the world, whether a child can be breastfed or not can make the difference between life and death, and whether a child will develop to reach his or her full potential.

Prematurity is one of three major causes of new-born deaths in South Africa, with diarrhoea and respiratory infections being the main causes of death in children younger than five years old. Breastfeeding can reduce infant mortality by a third and sickness by half (du Plessis 2013: 6). This South African study indicated that premature babies are particularly vulnerable in limited-resource settings and developing countries due to a lack of feasible cost-effective care, such as warmth, breastfeeding support and basic care (du Plessis 2013: 8). There is a need for adequate monitoring and evaluation processes at all stages of implementation, using the above strategies to drastically improve exclusive and continued breastfeeding, and advancing the health and survival of children (Du Plessis & Pereira 2013:8).

Initiation of breastfeeding should not be delayed, especially with mothers who are encouraged to practice skin-to-skin (kangaroo mother care) (Safari, Saeed, Hasan & Moghaddam-Banaem 2018: 7). Evidence has shown that the attainment of a specific gestational age or body weight is not a useful guide, but the infant's behaviour is the determining factor. The repeated interactions that an infant's experiences during feeding are incorporated into and shape neural development (Brown, Thoyre, Pridham & Schubert 2009:491). It is essential that premature infants start oral feeding as soon as possible to survive and get healthy quickly (Yildiz & Arikan 2012:649).

The most significant of these benefits is the reduction in infections (Dowling, Blatz & Graham 2012:378). It is of utmost importance that preterm infants begin oral feeding at as young an age as possible to enhance survival and recovery (Arikan, Gozum, Tastekin & Budancamanak 2011:268).

Many neonatal units are still giving either, bottle, cup and spoon-feeding to premature infants after the removal of a nasogastric tube, and this is a great concern. In the past, it was believed that breastfeeding is more tiring than bottle feeding (Brown, Thoyre, Pridham, & Schubert 2010:497).

Breastfeeding is challenging for preterm infants compared to full-term infants because of their physiological and neuromuscular immaturity. Mizuno and Ueda (2008:38) found that sucking efficiency significantly increased between 34 and 36 weeks after conception. Nyqvist and Kylberg (2013:48) found that preterm infants-initiated breastfeeding at a median age of 33.7 weeks post-menstrual age, achieved first nutritive sucking at a median age of 34.3 weeks, and achieved exclusive breastfeeding at 36.0 weeks. These findings suggest the appropriate time for initiating breastfeeding among physiologically stable preterm infants. Prior research suggests that interventions that promote breastfeeding for premature infants can improve breastfeeding outcomes and weight gain. These interventions included pre-discharge education and follow-up, peer counselling and home visits and home telephone follow-up (Ahmed & Sands 2010:47).

1.2 SOURCE OF THE RESEARCH PROBLEM

South Africa is one of the countries in the Sub Sahara region of Africa, and it has similar mother and child health challenges as found in its neighbouring countries. Preterm labour is not an obstetrical problem but extends further and becomes a neonatal feeding problem later in the premature infant's life. The premature infant's increased nutritional requirements, together with the limited abilities to suckle require special attention and consideration related to breastfeeding initiation (Gordon 2017: 1236).

Ekurhuleni is one of the four regions in the Gauteng province. This region occupies the entire eastern part of the province. Like all other provinces, Gauteng is burdened with a high number of infants who are delivered prematurely, which in turn increases the neonatal mortality rate due to delayed initiation of breastfeeding. Most of these neonates are firstly fed through a nasogastric tube in the first few months of its life. Most of the hospitals in the Ekurhuleni region are Baby-Friendly Hospitals having labour wards which practice skin-to-skin and breastfeeding soon after the birth of the baby to full-term infants. Kangaroo care to premature infants is practiced later after the baby's condition has become stable. Kangaroo care reduces the risk of mortality, infections and sepsis, hypothermia, length of hospital stay, some measures of growth, breastfeeding and mother-infant attachment (Gregson & Blacker 2011:568).

Neonatal Care Units encourage the mothers of premature infants to express breast milk to feed their premature infants through a nasogastric tube. Mothers of premature infants are involved in the nasogastric tube feeding of their infants until such time that the nasogastric tube is removed. The involvement of premature infant's mothers in nasogastric tube feeding is done to promote bonding and attachment between an infant and their mother. Breastfeeding is not initiated while the infant is on nasogastric tube feeding. The premature infants are given their mother's expressed breast milk via a nasogastric tube.

The study was conducted at one of the district hospitals in the Ekurhuleni region. The researcher observed a high neonatal morbidity and mortality rate of premature infants of 20 per 1000 live births, which are related to feeding and especially the initiation of breastfeeding or no initiation of breastfeeding to these infants until they are discharged from the hospital. All the premature infants admitted in the Sick Neonate Unit are those delivered in the hospital, with all related problems leading to premature birth. The study focused on early initiation of breastfeeding to premature infants before discharge from the hospital.

1.3 STATEMENT OF THE RESEARCH PROBLEM

Premature births comprise a significant percentage of all births and are the leading cause of neonatal morbidity and mortality in many developing countries, including South Africa. Many of the reasons for deaths of premature infants are those related to late initiation of breastfeeding to these infants after nasogastric feeds. Premature infants refuse their mother's breast but suck vigorously from a bottle, cup or spoon feeding (Gordon 2017: 1236). The result is that infants that would benefit the most from breast milk are the ones deprived of its substantial benefits (Parker, Sullivan, Krueger & Mueller 2012:85). The study looked at factors that are associated with the delay in the initiation of breastfeeding to premature infants before discharge from the hospital. The current practice is that premature infant are discharged from the hospital without initiating breastfeeding, leading to them feeding through a bottle, a cup or spoon.

1.4 AIM OF THE STUDY

The study aimed to identify the factors which are associated with the delay in the initiation of breastfeeding to premature infants who were previously fed on a nasogastric tube while in the Sick Neonate Unit of a district hospital in Ekurhuleni region.

1.4.1 Research Objectives

The study will achieve the following objectives:

- Identify and describe factors associated with the delay of initiation of breastfeeding to premature infants
- Explain the maternal factors related to delayed initiation of breastfeeding to premature infants
- Identify associated maternal factors with regard to lack of breastfeeding knowledge
- Explain factors associated with health services that lead to delayed initiation of breastfeeding to premature infants

1.5 SIGNIFICANCE OF THE STUDY

The high rate of premature infants with extended stays in the Sick Neonate Unit or those who die due to problems related to feeding and initiation of breastfeeding has made it necessary to identify factors which are associated with this high rate of infant deaths. The study will contribute to the existing body of knowledge in midwifery and neonatal care. The findings of this study will provide reasons for the factors that delay the early initiation of breastfeeding to premature infants, and the study could form the basis for further research in the field. New knowledge will be of benefit in the future care and feeding of premature infants in the region. The study findings will bring about evidence-based knowledge in midwifery and neonatal care and practice. The information will help reduce perinatal, neonatal and infant mortality due to malnutrition.

1.6 DEFINITION OF CONCEPTS

Prematurity: it is a term used for the broad category of neonates born before 37 weeks of gestation regardless of birth weight (Marshall, Raynor & Nolte 2014: 622).

Premature infant: refers to the condition of an infant born before 37 completed weeks of gestation (Olds, London, Ladewig & Davidson 2014: 1043).

Nasogastric tube feed: means a tube that is inserted through the nose, down the throat and oesophagus, and into the stomach. It can be used to give drugs, liquids, and liquid food, or used to remove substances from the stomach. Giving food through a nasogastric tube is a type of enteral nutrition. (Lewis, Busher, Heitkemper & Harding 2017: 543).

Initiation of breastfeeding: refers to mother who has put her baby on her breast to suck for the first time, and this excludes the baby that has been given the expressed mother's milk by means of a cup, a spoon, syringe or a bottle (Olds, London, Ladewig & Davidson 2014: 972).

Hospital discharge: means the point at which the patient leaves the hospital and returns home. Discharge involves the medical instructions that the patient will need to fully recover (Lewis, Busher, Heitkemper & Harding 2017: 543).

1.7 RESEARCH DESIGN AND METHOD

The quantitative descriptive design has enabled the researcher to identify factors that contribute to the failure of initiation of breastfeeding to premature infants before discharge from the hospital. This design will allow the justification of current practice, make judgements or determine what other health professionals in similar situations are doing (Burns & Grove 2011- 256).

1.7.1 Quantitative Research

Quantitative research is a formal, objective, systematic process in which numerical data are used to obtain information about the world (Grove, Gray & Burns 2015: 20). Quantitative research is the investigation of phenomena that lend themselves to precise measurement and quantification, often involving a rigorous and controlled design (Polit & Beck 2014: 389).

1.7.2 Descriptive Research

It is research that typically has its primary objective as the accurate portrayal of people's characteristics or circumstances and/or the frequency with which certain phenomena occur (Polit & Beck 2014: 379). Descriptive research is conducted to discover new meaning, describe what exists, determine the frequency with which something occurs, and categorise information (Grove, Gray & Burns 2015: 502).

The following questions were formulated in this study:

- What are reasons for feeding premature infants with bottles, cups, spoons and syringes after nasogastric tube feed is stopped?
- What is the infant's response to oral feeding for the first time?
- What are the reasons for the staff of the neonatal unit to fail to support mothers of premature infants to initiate breastfeeding after nasogastric tube feed is stopped?

1.7.3 Study Population

This was the entire set of individuals or objectives that has common characteristics (Polit & Beck 2014:738). The study population was a more accessible subject of the target population (Bowers, House & Owens 2011:47). The population in this study will be all staff members and midwifery students working in the Sick Neonatal Unit and mothers of premature infants in the unit at the time of data collection. The accessible population comprises the individuals who conform to the eligibility criteria and are available for a study (Burns & Grove 2011:532).

1.7.4 Sampling Approach

Non-probability sampling is the selection of sampling units from a population using non-random procedures like convenience and quota sampling (Polit & Beck 2012: 735). This type of sampling is usually more convenient and economical and allows the study of populations when they are not amenable to probability sampling, or when the researcher is unable to locate the entire population (Brink, van der Walt & van Rensburg 2014: 139).

Convenient sampling involves the choice of readily available participants or study objects and is also known as accidental or availability sampling (Brink, van der Walt & van Rensburg 2014: 140). The available staff of Sick Neonate ward and mothers of premature infants whose infants had a nasogastric tube feeding in the ward were selected as subjects

1.7.5 Sampling

Sampling is the process of selecting a portion of the population to represent the entire population (Polit & Beck, 2012:742). According to Brink, van der Walt and van Rensburg (2014:132) sampling refers to the researcher's process of selecting the sample from a population to obtain information regarding a phenomenon in a way that represents the population of interest. In this study, a sample which represented the population of staff allocated in the neonatal units and mothers of premature infants who represent the entire population of premature mothers whose babies had a nasogastric tube feeding was selected. These groups of individuals were the most basic units about which information was collected (Brink, van der Walt & van Rensburg 2014:132).

1.7.6 Sample Size

The sample size is the number of people who participated in a study (Polit & Beck 2014: 181). It comprised of 50 members of staff of sick in the neonatal unit. This number included professional nurses and midwives, advanced midwifery students, one year Diploma midwifery students, students in the four year Diploma course in their third and fourth year of study when they were allocated in midwifery and in the sick neonatal unit, students from the South African National Defence Force studying midwifery, BA Cur students allocated in midwifery including neonatal unit, enrolled nurses and nursing auxiliaries in neonatal unit. Fifty mothers of premature infants in the neonate unit were included. Different mothers of premature infants were given questionnaires at different times when their neonates were admitted in the ward, to obtain adequate information from a large sample. Correct sample size could only be identified with significant differences in the study (Burns & Grove 2015: 266). The power analysis was used to evaluate the adequacy of sample size because power is the capacity to detect differences or relationships that exist in the population (Grove, Gray & Burns 2015: 366).

1.7.7 Data Collection

Data collection is the gathering of information to address a research problem (Polit & Beck 2014:288). The researcher considered the type of information needed to answer the research questions. Measurement scales were used to quantify data. Nominal scales were used to separate exclusive categories (Brink, van der Walt & van Rensburg 2014: 148).

The researcher decided on the type of research instrument after careful consideration of the alternatives for data to be captured. One person was going to collect the data to ensure that data was collected in the same manner. (Brink, van der Walt & van Rensburg 2014: 149). Data collection took place in a carefully controlled place, for example, in a neonatal unit in a Regional Hospital. The data collection process took more than six months because consideration was given to various students' allocation in the unit.

1.7.8 Method of Data Collection

It is the precise, systematic gathering of information relevant to the research purpose, objectives, questions or hypothesis of a study (Burns & Grove 2011:52). Structured self-reports were employed, whereby respondents completed the instrument themselves in a paper-and-pencil format. Open- and closed-ended questions were included, separate exclusive category types and Likert scale questions were asked (Brink, van der Walt & van Rensburg 2014: 149).

1.7.9 Data Analysis

Data analysis is the systematic organisation and synthesis of research data and testing of hypothesis using this data (Polit & Beck 2014: 378). In this study, it was done through statistical analysis**:** This will be used to enable numeric information to be organised, interpreted and communicated (Polit & Beck 2014: 379). Descriptive statistics were used to describe and synthesise data (Polit & Beck 2014: 379). Descriptive statistics in the form of tables, measurement scales and graphs will be used to describe and summarise data. The data will be analysed by the statistician using the IBM Statistical Package for Social Sciences (SPSS) Statistics 21 version.

In this study, data will be analysed according to different variables appearing in the tool and a summary of each section done in the Sick Neonate Unit and the Kangaroo Mother Unit. Frequency tables will be compiled to reflect the number of times the variable occurred. Pearson Chi will be utilised to show the association between variables.

1.7.10 The Eligibility Criteria

Eligibility criteria are used to designate the specific attributes of the target population, and by which subjects are included for excluded from participation in the study (Burns & Grove 2015: 251; Polit & Beck 2012:726).

1.7.10.1 Inclusion criteria

All staff members and midwifery students working in the neonatal unit assigned to premature infants of 30-34 weeks gestation who have started oral feeding, and mothers of premature infants of the same gestation age, and mothers who are literate and could understand questions written in English were included in the study.

1.7.10.2 Exclusion criteria

Exclusion criteria comprised mothers of premature babies who were not on nasogastric tube feeding, and mothers of other sick neonates in the unit, staff members of the neonatal unit who were not assigned to premature infants of 30-34 weeks of gestation, and not assigned to premature infants who were on a nasogastric tube, and mothers of premature infants who could not speak or understand the English language.

1.8 RELIABILITY

According to Grove, Gray and Burns (2015:288), reliability is concerned with how consistently an instrument measures the concept of interest. A paper-and-pencil scale to measure specific characteristics should indicate similar scores each time a subject completes it within a short period, and if it does not, it is considered unreliable.

1.9 VALIDITY

The validity of an instrument is a determination of how well the instrument reflects the abstract concepts being examined (Grove, Gray & Burns 2015:290). No instrument is completely valid; the degree of validity of a measure rather than whether validity exists (Burns & Grove 2015:291). Validity testing evaluates the use of an instrument for a specific group or purpose, rather than the instrument itself. An instrument may be valid in one situation but not another (Grove, Gray & Burns 2015:291). The instrument that will be used in this study might only be valid for this particular study and not another.

1.9.1 Construct validity

Construct validity is a key criterion for assessing the quality of a study (Polit & Beck 2012:339). Construct validity: It is used to explore the relationship of the instrument's results to measures of the underlying theoretical concepts of the instrument (Brink, van der Walt & van Rensburg 2014: 168).

1.9.1.1 Contrasted groups

This is also known as the "known groups approach". In the study, the contrasted group's approach was carried out by comparing two groups, whereby one group of mothers of premature infants strongly agreed initiating breastfeeding to their infants before discharge from hospital, and the other group strongly disagreed with the activity.

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1.9.2 Content Validity

Content validity is an assessment of how well the instrument represents all the components of the variable to be measured (Brink, van der Walt & van Rensburg 2014:166). Experts can evaluate the content validity of an instrument (Brink, van der Walt & van Rensburg 2014:166). Experts in maternal and neonatal care were consulted for more inputs in the study (Polit & Beck 2012:331-336).

1.9.3 Face Validity

Face validity means that the instrument appears to measure what it is supposed to measure. This type of validity should not be considered satisfactory to other types of validity (Brink, van der Walt & van Rensburg 2014:166). Face validity reflects what the instrument should measure, and this included the organisation of the questionnaires and their readability (Polit & Beck 2012:336-337). Experts in the field were consulted for both content and face validity before data were collected.

1.10 ETHICAL CONSIDERATIONS

Three fundamental ethical principles guide researchers in the research process. These principles are based on the human rights that need to be protected in research.

Respect for human dignity

Individuals are autonomous; they have the right to self-determination which implies that they have a right to decide whether to participate in a study or not, without their risk of penalty or prejudicial treatment (Brink, van der Walt & van Rensburg: 2014:35). Individuals participating in the study will be treated with respect and dignity.

Beneficence

Harm and injury will be minimised, and benefits will be maximised, right to protection from exploitation will be ensured by not using the information against the respondents who provided it in the study. Human research should be intended to produce benefits for participants (Polit & Beck 2014: 108).

Justice

The principle of justice refers to the right of participants to fair selection and treatment (Brink, Van der Walt & van Rensburg 2014:35). Justice and the right to fair treatment respondents who decline to participate after initial agreement will be treated without any prejudice.

Confidentiality and anonymity

Confidentiality is the researcher's management of private information shared by a subject or participant. The researcher will not share any information about the subject. Complete anonymity exists when the subject's identity cannot be linked, even by the researcher with his or her individual responses (Grove, Gray & Burns 2015:107). The researcher will promise the subjects that their identity will be kept anonymous from others and that the research data will be kept confidential.

1.11 SIGNIFICANCE OF STUDY

The study findings will be shared with the relevant health professional working with premature infants in the neonatal units with evidence-based information on the importance of early initiation of breastfeeding to premature infants to prevent malnutrition and perinatal mortality. The information will help reduce rates of perinatal, neonatal and infant mortalities, which take place due to malnutrition which one of them is due to delayed or no breastfeeding initiation to premature infants after removal of a nasogastric tube feeding.

1.12 SCOPE AND LIMITATIONS OF THE STUDY

The study attempts to determine the factors that delay the initiation of breastfeeding to premature infants before they are discharged from a hospital in the Ekurhuleni Region in the Gauteng Province. The generalisation of the findings to other regions of Gauteng Province is not possible, because the study was conducted in Ekurhuleni Region. The study was done in the hospital Sick Neonatal Care Unit (Polit & Beck 2012:180).

The study will only focus on early initiation of breastfeeding to premature infants who were previously fed on a nasogastric tube with the gestation age of 30-36 weeks gestation. The research is going to exclude other premature infants of different gestation periods. Premature infants who were not fed on the nasogastric tube will also not be looked at, which will require further research to be done. Another limitation will be concentrating on factors that delay initiating feeds to premature infants and will exclude full-term sick neonates who are fed on the nasogastric tube during the acute stage of illness.

Similar studies could be conducted in other regions in the Gauteng Province and other provinces in the country.

1.13 OUTLINE OF THE STUDY

The outline of the study is organised as follows:

Chapter 1 Orientation to the study

Chapter 2 Literature review

Chapter 3 Research design and methodology

Chapter 4 Data analysis and presentation

Chapter 5 Conclusions and recommendations

1.14 CONCLUSION

The study is going to address factors that lead to delayed initiation of early premature breastfeeding, not only for the infant's weight gain but preventing other nutritional deficiencies in these babies. It is necessary to undertake a research study in this area to provide evidenced-based results that will bring about improvement in the future. The study will identify the reasons why premature infants are fed on bottle, cup and spoon and not put on mother's breast immediately after stopping tube feeding. Results obtained from the population will be utilised to bring about change and improve current practice.

Chapter 1 has introduced the background of the study with emphasis on the factors that delay the initiation of breastfeeding to premature infants before discharge from the hospital in the Gauteng province. It provided an overview of the purpose of conducting the study, the study objectives were indicated, and the problem statement explained. The study methodology and design were discussed, and the structure of the dissertation outlined. Chapter 2 will discuss the literature review.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The researcher has undertaken an extensive and comprehensive literature review on the factors associated with delay of initiation of breastfeeding on a premature infant before discharge from hospital after removal of nasogastric tube feeding.

This chapter focussing on literature review contains a detailed discussion of existing literature on the main concepts that are found in the study.

In the literature review, the researcher paid attention to what other researchers have concluded about the topic. According to Burns and Groove (2011:189), a literature review is an organised written presentation of what has been published on a topic by scholars. The purpose of the review is to convey to the reader what is currently known regarding the topic of interest. Polit and Beck (2012:732) refer to it as a critical summary of research on a topic of interest, often prepared to put a research problem in context.

2.1.1 Purposes of the Literature Review

According to Brink, van der Walt and van Rensburg (2014:71) the researcher conducts the literature review for various reasons, which are:

- To conduct a critical analytical appraisal of the recent scholarly work on the topic by determining what is already known about the topic, the researcher can obtain a comprehensive picture of the state of knowledge.
- To identify the research problem and refine the research questions.
- To place the study in the context of the general body of knowledge, which minimises the possibility of unintentional duplication and increases the probability that the new study makes a valuable contribution.
- To provide the researcher with information on what has and has not been attempted with regards to approaches and methods, and types of data collection instruments that exist and work or do not work.

- To refine certain parts of the study, specifically the problem statement, hypothesis, conceptual framework, design and data- analysis process.
- To compare the findings of existing studies with those of the study at hand. This process shows the relevance of the latter findings to the existing body of knowledge.
- To direct the planning and execution of a study in quantitative research (Brink, van der Walt and van Rensburg: 2014:72).

2.2 A PREMATURE INFANT

According to Olds, London, Ladewig and Davidson (2014:1044), the term “premature infant” refers to a preterm or premature neonate born before 37 weeks of gestation. A preterm infant is born before the end of the 37th gestational week, regardless of birth weight (Marshall, Raynor & Nolte 2014:621). Preterm infants face an increased risk of morbidity and mortality (Fleishman, Oinuma & Clark 2010:137; Osrin 2010:648).

Preterm infants are immature and not ready to adapt to extrauterine life (Macdonald & Johnson 2012:628). The major problem of a preterm newborn is variable immaturity of all systems including the gastrointestinal system. The degree of maturity depends upon the length of gestation. The preterm infant must traverse the same complex, interconnected pathways from intrauterine to extrauterine life as a term baby; however, the preterm infant immature tissues and organs are ill-equipped to make this transition smoothly (Olds, London, Ladewig & Davidson 2014:254).

2.2.1 Classification of Prematurity

Maye’s Midwifery (2013:645) has classified prematurity according to birth weight, rather than gestation age because birth weight is the better predictor of outcomes. Birth weight The World Health Organisation (WHO 2011:22) definition of low birth weight is internationally adopted with further subdivisions, as shown below:

Table 2.1: Low birth weight

TYPE OF LOW BIRTH WEIGHT	INFANT’S WEIGHT AT BIRTH
Low birth weight (LBW)	Lower than 2500 g
Very low birth weight (VLBW)	Lower than 1500 g
Extremely low birth weight (ELBW)	Lower than 1000 g

2.3 GLOBAL OVERVIEW OF INITIATION OF BREASTFEEDING ON A PREMATURE INFANT

Undernutrition is estimated to be associated with 2.7 million child deaths annually or 48 per cent of all child deaths. Optimal breastfeeding is so crucial that it gave the lives of over 800 000 children under the age of 5 years each year (WHO & UNICEF 2018:). A study done in Denmark by Maastrup, Hansen, Kronborg, Bojesen, Hallman, Frandsen, Kyhnaeb, Svarer and Hallstrom (2014:78-82), has found that breastfeeding rates in Danish preterm infants are significantly lower about 65 per cent at discharge than breastfeeding initiation in full-term babies about 99 per cent.

A study done by Montjaux-Regis, Cristini, Arnaud, Glorieux, Vanpee and Casper (2010:1149) in three European regions namely Lle-de-France in France, Lazio in Italy and the former Trent region in the United Kingdom revealed that policies and practices for managing the mother's own milk for preterm babies differed between regions and were more complex in Lle-de-France than in the Trent regions. Staff approaches mothers to initiate lactation varied by region as well. Another Danish study by Maastrup, Hansen, Kronborg, Bojesen, Hallman, Frandsen, Kyhnaeb, Svarer and Hallstrom (2014:78-82), found that breastfeeding is the best nutrition for preterm infants. However, these infants are not strong enough to be exclusively breastfed in the first days of their lives.

In Iran, a study done by Valizadeh and Penjvini (2014:373-377) provided insight into the effective factors on the mother's experiences of breastfeeding their premature infants and their coping strategies. They also found that mother's experiences of feeding their premature babies included worries, uncertainties, about their infant feeding, interpreting the neonate's feeding behaviour, and mother's adaptation with breastfeeding (Valizadeh & Penjvini 2014:376). Other factors involved maternal inexperience, young age, clumsiness, problems in holding the infant, difficulties in regulating milk volume, lack knowledge (Hay 2018: 239). Young and first-time mothers and had given birth to a premature baby, should be capable of breastfeeding at home and had little experience about dealing and feeding their infants (Valizadeh & Penjvini 2014: 374). At the beginning of breastfeeding, these mothers felt out of control, powerless, confused, emotionally unstable, afraid, guilty and insecure (Hay 2018: 239).

They found some mothers more embarrassed and ashamed of breastfeeding in public, as this is panache in some cultures (Hay 2018: 242). The prolonged hospitalisation, use of nasogastric tube feed, lack of sufficient sucking reflex was some of the factors identified. The infant's feeding manner included readiness to be fed whereby the baby was aware, alert, and had shown a rooting reflex and signs of hunger and fullness after feeding (Hay 2018: 235). In a study done by Viera, Viera, Giugliani, Mendes, Martins and Silva (2010:5) in Pelotas (Brazil), late preterm infants were found to be 10 per cent more likely not to commence breastfeeding or receive breast milk within the first 24 hours of life than term infants whose mothers were done caesarean section. Another cross-sectional study done in Brazil in Rio je Neiro by de Carvallo, Boccolin, Couto de Oliveira and do Carmo–Leal (2016:264) found that premature infants were less breastfed within the first hour of life due to their specific characteristics related to their immaturity, lack of proper coordination of the suction-deglutition-respiration cycle and the breast seeking reflex. This study also identified problems associated with the infant's long sleeping hours and their mother's inability to recognise hunger signs (de Carvallo, Boccolin, Couto de Oliveira and do Carmo–Leal 2016: 48).

An Australian study by Harding (2015:4) found that preterm infants are at a higher risk of neonatal morbidity, experiencing one or more short and long term health outcomes like hypoglycaemia, hypothermia, jaundice, delayed oral feeding, readmission to hospital, transient tachypnoea, neuro-developmental delays, and high mortality**.** A study done by Imdad and Bhutta (2013:114) emphasised that exclusive breastfeeding is protective for a mother and her infant and that it has shown to reduce morbidity and mortality in infants. Shwetal, Pooja, Neha, Amit and Rahul (2012:307) have found that early initiation of breastfeeding can reduce neonatal mortality by 22 per cent. This can decrease the infant mortality rate and contribute to the attainment of the Sustainable Development Goal 2 which is to Achieve Zero Hunger and Goal 3 which aims to Improve Health and Well-being at all ages by 2030 (Shwetal, Pooja, Neha, Amit & Rahul 2012:307). According to these goals, in India alone, early initiation of breastfeeding can save 250,000 lives by reducing death mainly due to diarrheal disorders and lower respiratory infections in infants (Shwetal, Pooja, Neha, Amit & Rahul 2012:307).

In South Asia, only 24 per cent– 25 per cent of babies born in India, Pakistan and Bangladesh are breastfed within 1 hour while the corresponding rate for Sri Lanka is 75 per cent (Shwetal, Pooja, Neha, Amit & Rahul 2012:307).

In Vardhan Medical College and Safdarjang Medical College New Delhi, a study of Goyal, Laura, Attanasio and Kozhimannil (2014:330) found that only 15 per cent of mothers initiated breastfeeding within 2 hours of an infant's life. In a study done in California by Barick and Reinhold (2010:1053), 89 per cent of mothers were rooming-in, 66 per cent of mothers had early initiation of breastfeeding.

In a Nepalese study by Khanal, Scott, Lee, Karker and Burns (2015: 9565) none of the mothers got breastfeeding advice in antenatal care. Five per cent of mothers-initiated breastfeeding within 1/2 hour. In Vadodara city, in India, a study was done by Shwetal, Pooja, Neha, Amit and Rahul (2010:306) found that 32.6% of mothers-initiated breastfeeding within one hour of delivery in a tertiary care hospital. Goyal, Laura, Attanasio and Kozhimannil (2014:330), in their study in East Delhi, India, found that only 9.1% infants were breastfed within one hour, and 71.7% mothers agreed that breastfeeding protects from infection and is the healthiest food.

2.4 PREMATURE INFANT BREASTFEEDING

Breastfeeding is the standard way of feeding all infants, it enhances sensory and cognitive development and is one of the most cost-effective ways to reduce infant morbidity and mortality from the diarrheal disease, respiratory disease and other infections (Shwetal, Pooja, Neha, Amit & Rahul 2010:302). The benefits of breastfeeding for the health and wellbeing of the mother and her infant are well documented (Mallik, Dasgupta, Naskar, Sengupta, Choudhury & Bhattacharya 2013:27). According to Mallik et al. (2013:25), adequate nutrition during infancy is essential to ensure growth, health and development of children to their full potential. WHO and UNICEF recommends early initiation of breastfeeding to all new-born infants including premature babies. Breast milk is established as the best nutrition for all infants to support optimal growth and brain development (Hallowell & Spatz 2012:158; Nyqvist 2013:296).

Infants who receive breast milk have a decreased risk of necrotising enterocolitis, acute infant respiratory and gastrointestinal diseases, asthma, obesity and type 2 diabetes (American Academy of Paediatrics 2012:841). Colostrum is an essential building block of lifelong nutrition and appears to lower the risk of NEC in preterm infants (Arboreta, Brinetti, Salazar & Solis 2012:108; Lee, Mui, Wroblewskis, Karrison, Noble, Withers, Swisher, Heydemann, Scuitter & Bablaiz 2012:1597). Direct feeding from the mother's breasts, versus bottle or cup feeding, provides optimal immunological and nutritional benefits of breast milk without losing any benefit from the use of freezing and thawing (Garcia – Lara, Escuder-Vieco & Tacken 2012:299). Breast milk has a high content of protein which is essential for growth in preterm infants (Montjaux-Regis, Cristini, Amaud, Glorieux, Vanpee & Casper 2011:1188).

2.4.1 Initiation of Breastfeeding in Premature Infants

WHO and UNICEF (2007-2014) recommend early initiation of breastfeeding to all new-born infants including premature babies. Breastfeeding is particularly important in preterm infants for long-term physical and developmental health, and this population of infants is at risk for poor breastfeeding initiation and outcomes (Goyal, Attanasio & Kozhimannil 2014:335). A study conducted by Lucas and Smith (2015:136) has shown that stable preterm infants maintain their physiological status during exposure to the breast as early as 27-28 weeks of gestation. In a study done in Pelotas Brazil by Viera, Viera, Giugliani, Mendes, Martins and Silva (2010:6), late preterm infants were found to be 10 per cent more likely not to commence breastfeeding or receive breast milk within the first 24 hours of life than term infants. It is important to identify potentially modifiable factors that contribute to failure to initiate breastfeeding for preterm infants to customise breastfeeding support strategies that can address these factors in the clinical setting (Ayton, Hansen, Quinn & Nelson 2012:3-17). These researchers found that a combination of caesarean delivery and prematurity of the infant created a complex feeding scenario. Ineffective sucking at the breast leading to inadequate intake of milk volume, delayed and low production of maternal milk, infant lethargy, sleepiness, hypoglycaemia and hypothermia (Ayton et al. 2012:12). Premature infants present with subtle problems that predispose them to poor breastfeeding outcomes, they are less likely to initiate at birth and to be discharged exclusively breastfeeding at hospital discharge when compared to term babies (Ayton et al. 2012:14).

2.5 FACTORS ASSOCIATED WITH DELAYED BREASTFEEDING IN PREMATURE INFANTS

Breastfeeding promotion is a key child survival strategy, and has a significant contribution to the achievement of the child survival millennium development goal, 16 per cent of neonatal deaths could have been saved if all infants were breastfed from day one, and 22 per cent if breastfeeding started within the first hour of life (Goyal, Attanasio & Kozhimannil 2014:333). Breastfeeding promotion programs should emphasise early initiation as well as exclusive breastfeeding, particularly in sub- Saharan Africa where neonatal and infant mortality rates are high but most women already exclusively or predominantly breastfeed their infants (Goyal, Attanasio & Kozhimannil 2014: 335). Breast milk is established as the best nutrition for all infants to support optimal growth and brain development (Hallowell & Spatz 2012:159; Nyqvist 2013:297). Methods to stimulate the premature infant have been suggested to improve the early breastfeeding to premature infants, and daily stimulation of sucking and swallowing in premature infants with poor sucking ability would lead to earlier ability to feed orally and earlier hospital discharge (Bragelien, Rokke & Markestad 2010:1431).

2.5.1 Mother's Lack of Knowledge of Breastfeeding

A study done by Mallik, Dasgupta, Naskar, Sengupta, Choudhury and Bhattacharya (2013:26), has shown that the more educated a postnatal mother is, the more knowledgeable she is in terms of initiation of breastfeeding immediately after delivery of their infants. Knowledge score increased with age, educational status, improved socio-economic status. A good knowledge score was observed in 93.2% of mothers having secondary education, 92.0% with higher secondary education and 100 per cent with education graduate and above (Mallik et al. 2013:29). In a Nigerian study by Balogun, Okpalugo, Ogunyemi and Sekoni (2017: 127), a significantly higher proportion of mothers with at least secondary education-initiated breastfeeding within 1 hour, avoided pre-lacteal feeding and practices exclusive breastfeeding for six months. Maternal education below secondary level strongly contributed to pre-lacteal feeding other feed given to an infant before initiation of breastfeeding) and failure of initiation of breastfeeding and exclusive breastfeeding (Mallik et al. 2013: 27).

In their study, Mallik et al. (2013: 26) also found that time of initiation of breastfeeding was not influenced by knowledge score, as an almost equal proportion of mothers (66.1% and 66.2%) with good and poor knowledge score put their babies to the breast immediately, due to the inconvenient hospital environment. In this study mothers had good knowledge that breastfeeding is better than bottle feeding, first yellow milk (colostrum) should be given to the baby because yellow milk is beneficial to the baby, duration of exclusive breastfeeding, duration of continuing breastfeeding and ways to know whether breastfeeding is adequate (Malik et al. 2013:28).

According to these researchers, counselling and demonstration of breastfeeding could improve the initiation practice. Shwetal, Pooja, Neha, Amit and Rahul (2012:309) found that the practice of pre-lacteal feeding was found to be associated with a delay in the initiation of breastfeeding. Lack of adequate information being given to mothers is a major factor responsible for low rates of exclusive breastfeeding and early initiation of breastfeeding (Shwetal et al. 2012:306).

2.5.2 Delivery by Caesarean Section

Ayton, Hansen, Quinn and Nelson, in their (2012:16) study of factors associated with initiation and exclusive breastfeeding at hospital discharge where late preterm infants were compared to 37 weeks gestation infants, found that that initiation of breastfeeding was significantly lower for late preterm infants when compared to 37 weeks gestation. Late preterm infants born by lower uterine caesarean section were 80 per cent less likely to initiate breastfeeding within one hour of birth (Ayton et al. 2012:4). In their study, an important factor for predicting breastfeeding failure was gestational age and a caesarean section birth (elective and emergency combined). Another risk for delaying the first breastfeeding identified was delivered by a caesarean section (Vieira et al. 2010:5). According to these researchers, birth by caesarean section is a significant barrier that inhibits breastfeeding within the first hour of life, because of the limitation on the mother's ability to touch her baby (Vieira et al. 2010:5).

Another point was the mother's analgesia, which may cause disorganized behaviour in the newborn infant and may result in delay and impairment of the first breastfeeding, this is shown through lower frequency of finger and hand movements, less touching of the

nipple and breast (licking and sucking) and more crying than observed among children whose mothers did not receive analgesia (Vieira et al. 2010:6). A study done in Chinese society Zihang, Jin, Vereijkan, Stahl and Jiang (2018: 269), where high rates of caesarean sections are prevalent, showed that this was a risk factor for weaning in the first and third months of life. A study was done in Pelotas by (Vieira et al. 2010:15) in Brazil was associated with twice as much risk of not breastfeeding within the first hour of life. Another study done in Brazil Rio de Janeiro by (de Carvallo et al. 2016: 255) found that visual or physical contact between mother and baby, along with breastfeeding in the delivery room was less frequent among women who underwent Caesarean Section delivery, where there were long-time intervals between delivery and first breastfeeding.

2.5.3 Preterm Infant's Mother's Experiences after Baby's Discharge from Hospital

Mothers of preterm infants become very anxious before their babies are discharged from the hospital, and are not certain if they would be able to initiate and maintain breastfeeding. A qualitative study done by Valizadeh and Penjvini (2014:374) was more on the mother's worry about breastfeeding at home, interpreting the neonates feeding behaviour and adapting with the current situation. A study done by Hurst (2007:207)revealed that the most significant source of mother's stress were interruptions in the milk flow because of inadequate sucking and swallowing, fear of infant's survival with respect to baby's inability to feed, maintaining and adaptation with the infant's feeding process experienced was mostly related to culture and physical problems (Valizadeh & Penjvini 2014:377). Cultural limitations of breastfeeding interfere with the mother-child-attachment process, suitable feeding and growth and development of the neonate (Valizadeh & Penjvini 2014:375). Daglasand Antoniou (2012:358) believed that paying particular attention to ethnic and cultural issues in breastfeeding maintenance is of utmost importance.

2.5.4 Mother-Infant Long Separation during Hospitalisation

A study done in Sweden by Bjork, Thelin, Peterson and Hammarlund (2012:25) showed that mother-child separation during the first weeks of life exerted severe mental pressure on the mother and could interfere with the breastfeeding process.

Neonatal Intensive Care Units that separate mother and infant limit the successful establishment of breastfeeding, longer sleep intervals contributing to less overall time breastfeeding, uncoordinated suck, swallowed, breathing organisation and decreased oro-motor tone that minimises the negative pressure required for adequate milk flow (Committee on Obstetric Practice 2008).

2.5.5 Poverty

A study done in Ohio's Appalachian Region by Radtke (2011:13) indicated poverty being a unique culture that influences the behaviour, attitudes and values of people living in it. Low socioeconomic status is related to low achievement in a variety of areas, including health-related behaviour. Women from poverty-stricken communities do not have the necessary skills, have difficulty with breastfeeding and would not consider breastfeeding before giving birth (Bailey & Wright 2011:33). Women living in poverty, especially in rural areas, will have difficulties obtaining transportation to and from health care appointment, making it difficult to get help when they experience breastfeeding problems (Bailey & Wright 2011:38).

2.6 PROMOTION OF BREASTFEEDING TO PRETERM INFANTS BEFORE DISCHARGE FROM HOSPITAL

2.6.1 Stimulation by Nutritive Odour

Successful oral feeding in preterm depends on the coordination between sucking, swallowing and respiration and on neurological maturation of oral muscles and development of sucking techniques. Research has found that despite low birth weights, preterm infants could graduate earlier to oral feeding with the implementation of nutritive odours (Bingham, Ashikaga & Abbasi 2010:196). A study of Aynur and Arikan (2011:645) reported that the stimulation with breast milk odour contributes to the development of sucking behaviour in preterm infants, which in turn leads to relatively early toleration of oral feeding, their daily weight gains are followed until the weight is deemed sufficient for discharge. The study of Aynur and Arikan (2011: 650) also found that preterm infants exposed to breast milk odour during gavage (nasogastric tube) feeding made the transition to oral feeding sooner, had increased weight gain and were discharged from hospital earlier than those who did not receive the stimulation.

Neonatal unit nurses can encourage mothers to express breast milk to feed their infants on nasogastric tube feeding but also benefit from the stimulus effect of breast milk odour enabling a quicker transition to oral feeding (Aynur & Arikan 2011: 653). Studies have also shown non-nutritive sucking activated using various stimuli has a beneficial effect on the duration of hospitalisation, the transition from gavage feeding to oral feeding, and the development of digestion (Bingham, Ashikaga & Ababas 2010: 198).

2.6.2 Kangaroo Mother Care (KMC)

Time spent skin-to-skin in the neonatal intensive care unit is associated with breastfeeding duration in preterm infants in a study by Flacking, Ewald and Wallim (2011:1128). They also found an association between KMC and exclusive breastfeeding. Women who practised KMC for more extended periods were able to breastfeed exclusively compared to those who did not practice KMC (Flacking, Ewald & Wallim 2011: 1128). Their results also showed the association between duration of KMC per day and method of feeding were analysed. Infants who were fed on a breast only had experienced more KMC time per day than those infants fed by both bottle and breast (Flacking, Ewald & Wallim 2011 1130). The researchers recommend NICU to be structured in such a way that mothers can be close to their infants 24 hours a day. They found that KMC allows mothers to be more self- sufficient in mothering and breastfeeding (Flacking, Ewald & Wallim 2011 1130). The use of KMC enables breastfeeding to be more pleasurable and meet the emotional needs of mothers and their infants and consequently, longer breastfeeding duration (Dykes & Flacking 2010:339; Flacking et al. 2011:1129).

KMC has longer breastfeeding duration compared to routine care (Durgappa, Parimala, Sudhakar & Mahanth 2012:15). Peer counselling increased breast milk intake than those without peer counselling (Dykes, & Flacking 2010:335). The use of nasogastric tube feeding during the transition to breastfeeding was associated with a significant increase in breastfeeding on discharge (Durgappa, Parimala, Sudhakar & Mahanth 2012:17). A study done by Gregson and Blacker (2011:577) found that KMC is associated with a shorter hospital stay and more exclusive breastfeeding on discharge from hospital and that it is an intervention that is easy to introduce to the clinical area that is inexpensive and is highly rated by parents (Gregson & Blacker 2011:577).

2.6.3 Skin-To-Skin Holding

Numerous studies that were undertaken worldwide demonstrated the importance of skin-to-skin (STS) care and its effectiveness in promoting physiologic stability in the high-risk preterm infant (Safari et al. 2018:4). There is considerable evidence that the duration of breastfeeding appears to be higher in the mothers of infants who practice STS than for the incubator controls (Safari et al. 2018:7). There is considerable evidence that new-born babies possess innate reflexes that enable them to find the nipple, attach correctly and breastfeed effectively, provided they are given the opportunity to remain in naked body contact (skin-to-skin with their mother for a sufficient length of time) (Angelhoff, Blomqvist, Helmer, Olsson, Shorey, Frostell & Morelius 2018:5). Continuous STS contact after birth until the infant actively takes the first breastfeed is a best practice standard and recommended for Baby-Friendly Hospital Initiative accreditation (Angelhoff et al. 2018:7). WHO and other organisations recommend delaying for at least the first-hour routine newborn care procedures that separate mother and baby, such as bathing and weighing, to mother and new-born uninterrupted STS contact until the first breastfeed. (Shwetal et al. 2012:307).

2.6.4 Sucking at the Empty Breast

A series of controlled trials have demonstrated the benefit of non-nutritive sucking (NNS) with a dummy or soother for preterm infants. Low birth weight infants made the transition from tube to oral feeding more quickly when they used a dummy because of the accelerated maturation of the sucking reflex. (Narayanan, Mehta, Choudhury & Jain 2015:242). NNS can begin as soon as an infant is extubated. As an infant matures, the mother can combine suckling on an emptied breast with tube feeding so that an infant learns to associate suckling with feeding. When an infant demonstrates the ability to coordinate suckling with swallowing and breathing, the progression from NNS to nutritive suckling can begin (Narayanan et al. 2015: 241).

2.6.5 Attachment and Positioning

According to a study by Narayanan et al. (2015: 243), achieving correct attachment and positioning while assisting a mother to breastfeed a preterm baby is challenging to achieve effective milk transfer an infant must be in a suitable and correct position.

2.6.5.1 The Underarm Position ("Football Hold")

This position gives a mother more control of an infant's head and a clear view of the infant's face. Attachment is also critically important to feeding outcome (Jones & Spencer 2009: 113). A nipple shield is also a useful tool when an infant has problems retaining the nipple in the mouth.

2.6.5.2 Progression of feed

According to Narayanan et al. (2015:242), preterm infants are incapable of rhythmic suckling, which inhibit the milk ejection reflex and restrict milk intake, they found that it is necessary to place an infant on one breast and a pump on the other to provide more intense stimulation.

2.6.6 Providing Breastfeeding Literature to Women

A study done in Ohio's Appalachian Region by Radtke (2011:18) has shown that breastfeeding women referred to the literature often and found it to be a valuable source of information. Some mothers noted a DVD that they watched in hospital, and perceived it as very helpful. Almost all women indicated having in-person support as more important (Raffle, Ware, Borchardt & Strickland 2011:72). In this study, more women felt that the pamphlets were given to them only contained good and positive information about breastfeeding. The Appalachian study by Radtke (2011: 17) found it is necessary to provide an array of strategies particularly those that capitalise on Appalachian values of independence, self-reliance, pride and humour to help them feel comfortable with breastfeeding in public, and with taking away the fear of breastfeeding in public places to identify safe places for women to breastfeed.

2.6.7 Midwife's Knowledge of the Benefits of Breastfeeding

A study that was done by Durgappa, Parimala, Sudhakar and Mahanth (2012:12) emphasised midwives involved in the care of women in the early postnatal period need a high level of knowledge concerning the benefits of breast milk and management of common breastfeeding problems. Midwives require advanced knowledge and skill to optimise infant's use of their innate feeding ability to initiate breastfeeding (Durgappa, Parimala, Sudhakar & Mahanth 2012:15).). It is up to midwives, other health professionals and education providers to ensure information from evidence-based research are implemented for the care of women and their families at the time of breastfeeding initiation (Durgappa, Parimala, Sudhakar & Mahanth 2012:110). In their study, they found that midwives with high knowledge scores were more likely to report best practice when assisting mothers to initiate breastfeeding. Midwives personal breastfeeding experience provided sufficient knowledge in their capacity to adequately inform and support mothers initiate breastfeeding (Durgappa, Parimala, Sudhakar & Mahanth 2012:11).

2.6.8 The Efficacy of a Multidisciplinary Intervention

The multidisciplinary intervention appears to help mothers with facing the difficulties they encounter in initiating lactation (Gianni, Bezzi, Serinnino, Stori, Plevani, Roggero, Agosti, & Mosca 2013:179). Family support and positive attitudes towards pumping have reported promoting the maintenance of breast milk production. The implementation of Baby-Friendly Hospital policies in a NICU led to an increase in the breastfeeding initiation rate (Sadacharan, Matlak, Grossman & Merewood 2013:437). The multidisciplinary intervention performed in the researcher's one single centre appeared to be effective in promoting breastfeeding in preterm infants at discharge (Gianni et al. 2013:179).

2.6.9 Other Factors Promoting Breastfeeding in a Preterm Infant

The use of general nursing interventions to improve feeding outcomes, including education interventions to guide mothers to increase alertness for feeding by talking and gently stroking their infants, how to position infants during feeding interactions for safe and efficient intake (Puapornpang, Raungrugmorakot, Manolerdtenan & Sketsuwan 2015:1077).

Fewer mothers of preterm infants experienced several hospital practices intended to promote breastfeeding, for example, holding their babies during the first hour after birth, and a small number of mothers roomed in with their infants (Goyal, Attanasio & Kozhimannil 2014:333). These researchers also observed that high level of hospital support for breastfeeding was associated with increased breastfeeding and later exclusive breastfeeding to preterm infants at discharge. Preterm infants were less likely to be held on mother's arms during the first hour of birth, and less likely to room in and were more likely to be offered a pacifier and had decreased likelihood of skin-to-skin contact with their mothers (Goyal, Attanasio & Kozhimannil 2014:335). The physiologic challenges associated with prematurity like feeding dysfunction, hypoglycaemia and temperature instability provide logistical barriers that supersede the benefits of high hospital supportive care to breastfeeding. High levels of hospital support increase the likelihood of breastfeeding for infants regardless of gestation age, suggesting that such practices should be routinely provided as the clinical situation allows.

2.7 RECOMMENDATIONS TO IMPROVED INITIATION OF BREASTFEEDING

- Midwives must have advanced knowledge of breastfeeding initiation to premature infants to be able to provide support and empower mothers of these infants with information as early as the antenatal period.
- Involvement of the entire family is necessary for educating women about breastfeeding so that in those cultures where the older generation is the source of advice and support can assist young women in understanding and perceiving breast milk as the best nutrition for their infants.
- It cannot be assumed that personal breastfeeding experience provides sufficient knowledge in a professional capacity to adequately inform and support mothers. It is up to midwives, other health professionals and education providers to ensure information from evidence-based research is implemented for the care of women and their families at the time of breastfeeding initiation (Creedy, Contrill & Cooke 2008:10).
- Measures should be started during the prenatal period with the development of educational actions that place value on and clarify the advantages of breastfeeding within the first hour of life (Vieira et al. 2010:6).

- It is necessary and important to build strong social support networks for breastfeeding in the community, consideration of using multi-generational approaches so that women get positive feedback for breastfeeding from all ages (Voinovich School of Leadership and Public Affairs at Ohio University 2011:486).
- Women should be provided with information about the positive and negative factors of breastfeeding to enable them to cope better with problems they might encounter.
- Assessment of midwives' understanding of the neurobehavioral adaptation of both mother and infant supports the goals of Baby-Friendly Hospital Initiation (Creedy, Contrill & Cooke 2008:11).

2.8 CONCLUSION

Promotion of the early initiation of breastfeeding has the potential to make a significant contribution to the achievement of the Sustainable Development Goal 2 and 3. The SDG 2 aims at ending hunger and improving nutrition globally because of poor nutrition results in the deaths of about 45 per cent of the worlds under-five children including premature infants. SDG 3 focuses on reducing child and maternal deaths, as well as improving the health for all people worldwide through targeting conditions such as HIV/AIDS, non-communicable diseases and preventable child deaths. More baby's lives could be saved if breastfeeding is started within the first hour of life to full-term infants and long before discharge to premature infants. Promotion of breastfeeding programs should put more emphasis on initiation and exclusive breastfeeding. Increasing and initiation of early breastfeeding practices improves nutrition for everyone, which is a positive step towards promoting health well-being and healthy lives for all globally. Chapter 3 will address the research methodology applied in this study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

In this chapter, the research design was discussed in terms of the methods, population, sampling, instruments, data collection and analysis procedures pertaining to the present study. The research design was used to determine the aims and objectives of the study.

The objectives of the study were to:

- Identify the reasons for feeding premature infants with bottles, cups, and spoons and syringes after nasogastric tube feed is stopped
- Explore and describe the infant's response to oral feeding for the first time
- Explain reasons for the failure of staff of neonatal unit to support mothers of premature infants initiate breastfeeding after nasogastric tube feed is stopped

3.2 RESEARCH DESIGN

A research design is a blueprint for conducting a study. The purpose of a design is to maximise control over factors that can interfere with the validity of the study findings (Burns & Grove 2011 253). The research design is the overall plan for addressing a research question, including specifications for enhancing the study's integrity (Polit & Beck 2012 745). The type of design directs the selection of a population, procedures for sampling, methods of measurement, and plans for data collection (Burns & Grove 2011:49). The design focuses on the end products and all the steps in the process to achieve the intended outcome of a study. A specific design was selected, and strategies identified to minimise biases. A research design also outlines how frequently data will be collected and where the study will be conducted (Polit & Beck 2014:173).

The quantitative, non- experimental(observational), cross-sectional and descriptive design was used in this study (Polit & Beck 2014:174).

3.2.1 Quantitative Research

Quantitative research is a formal, objective, systematic process which uses structured procedures and formal instruments to collect information, analyses numeric information through statistical procedures (Brink, van der Walt & van Rensburg 2014:11). This approach was used to describe variables, examine relationships among variables and determines cause and effect among variables under study. Quantitative research begins with preconceived ideas about how the concepts are interrelated, collects information under conditions of control (Brink, van der Walt & van Rensburg 2014:12). Quantitative research is conducted to describe new situations, events, or concepts; examine relationships among variables; and determine the effectiveness of treatments or interventions on selected health outcomes in the world (Grove, Gray & Burns 2015:32). The researcher does not participate in the events under investigation and tries not to influence the study with their values (Burns & Grove 2011: 25-26).

Quantitative research puts the emphasis more on objectivity in the collection and analysis of data; it focuses on a relatively small number of concepts (it is concise and narrow). Deductive reasoning is the process of developing specific predictions from general principles (Polit & Beck 2014:378).

In this study, data were collected using a formally structured instrument that included various variables concerning the factors that delay initiation of breastfeeding to premature infants before hospital discharge. Data were collected under conditions of control from mothers of premature infants, and all staff of Sick Neonate Unit and objectivity was ensured throughout.

3.2.2 Non- Experimental Design

Non-experimental designs are distinguishable from true experimental in that there is no manipulation of the independent variable, and there is no intervention in the situation (Brink, van der Walt & van Rensburg 2014:112). The study was carried out in a natural setting and phenomena are observed as they occur. The primary purpose of non-experimental research is to describe, explore and explain the relationships between variables.

This design is also applicable to variables that could be technically manipulated but ethically non-manipulative. The researcher does not intervene by controlling the independent variable in non-experimental designs (Polit & Beck 2014:159).

In this study, the researcher did not intervene by manipulating the independent variable in determining the factors that delay the initiation of breastfeeding to premature infants. The researcher intended to describe and explore existing relationships between variables.

3.2.3 Descriptive Design

The descriptive design is the exploration and description of phenomena in real-life situations (Grove, Gray & Burns 2015: 33). Through descriptive studies, researchers discover new meaning, describe what exists, determines the frequency with which something occurs and categorise information. The outcomes of this design include a description of concepts, identification of possible relationships between concepts and development of hypotheses that provide a basis for future quantitative research (Grove, Gray & Burns 2015:35).

These designs are used where more information is required in a field through the provision of a picture of the phenomenon as it occurs naturally. They describe the variables to answer the research question, and there is no intention to establish a cause-effect relationship. They may be used to identify problems with current practice; to justify the current practice, or determine what other professions in similar situations are doing (Brink, van der Walt & van Rensburg 2014:112-113).

The purpose of descriptive studies is to observe, describe and document aspects of a situation as it naturally occurs and sometimes to serve as a starting point to generate a hypothesis or develop a theory (Polit & Beck 2014:160).

In this study, the researcher required more information regarding factors that delay initiation of breastfeeding to premature infants in a district hospital in Ekurhuleni Region.

The researcher had identified problems with the current practice, whereby initiation of breastfeeding to premature infants was delayed until the infants are discharged from the hospital. The researcher also justified the current practice of feeding premature with cups, spoon, syringe and bottle after removal of nasogastric tube feeding in the Sick Neonate Unit where the study was conducted.

The researcher was able to describe, discover and observe naturally the practice of feeding premature babies after nasogastric tube feeding was removed in the ward. Self-structured questionnaires were used to document important aspects relating to delayed initiation of breastfeeding to premature infants in the unit by mothers themselves and the staff in the unit.

3.2.4 Cross-Sectional Design

This study is noncurrent in nature and is done at a specific point in time. All the information on a particular topic is collected at the same time from the same participants, and no identical study will be done after a specific period. These studies concentrate on the here and now (Brink, van der Walt & van Rensburg 2014:101). Cross-sectional studies can be exploratory, descriptive or explanatory in nature (Brink, van der Walt & van Rensburg 2014:101).

The advantages of the cross-sectional design are that it is very economical because data are collected at one point and it is not time-consuming, and the researcher can manage their data easily in this design (Polit & Beck 2012:184-186). Cross-sectional designs are appropriate for describing phenomena at a fixed point (Polit & Beck 2014:162).

The researcher in the study collected data at one point whereby questionnaires were completed by all staff of Sick Neonate Unit and mothers of premature infants whose babies were on nasogastric tube feeding.

3.3 POPULATION AND SAMPLING METHODS

3.3.1 The Study Population

The study population, according to Polit and Beck (2014:738), is the entire set of individuals or objects having some common characteristics, a group of individuals or elements who are the focus of the research (Burns & Grove 2011:291). The population is all elements (individuals, objects, or substances) that meet certain criteria for inclusion in a study (Grove, Gray & Burns 2015:46). The three definitions of the population above show that a population is not only restricted to human beings only, but can include other elements like hospital records, blood samples and many more in a given hospital.

In this study, the population of interest was all staff of a Sick Neonate Unit and mothers whose premature infants had a nasogastric tube for feeding in a district hospital in Ekurhuleni Region.

3.3.2 Target population

A target population is the entire set of individuals or elements who meet the sampling criteria (Grove, Gray & Burns 2015:250). It is the entire population in which a researcher is interested and to which he or she would like to generalise the study results (Polit & Beck 2014:393). The criteria that specify population characteristics that people must possess are the eligibility criteria or inclusion criteria (Polit & Beck 2012:274).

In this study, the target population was staff of a Sick Neonate Unit and mothers of premature infants who had a nasogastric tube feeding in the unit and after the removal of nasogastric tube, have fed the premature infants with a spoon, cup, syringe and bottle instead of initiating breastfeeding before these babies were discharged from hospital.

3.3.3 Accessible population

According to Grove, Gray and Burns (2015:250); Polit and Beck (2014:374) and Brink, van der Walt and van Rensburg (2014:131), an accessible population is the portion of the target population to which the researcher has reasonable access. The researcher draws a sample from an accessible population (Polit & Beck 2012:270).

The accessible population was all the staff working in the Sick Neonate Unit in a district hospital at Ekurhuleni Region in Gauteng Province, and mothers of premature babies who had a nasogastric tube feeding before oral feeding were started and were accessible to the researcher.

3.3.3.1 Inclusion criteria of the target population

It is critical that the researcher carefully defines and describes the population and explicitly stipulates the criteria for inclusion in it. These criteria are referred to as eligibility criteria, inclusion criteria or distinguishing descriptions (Brink, van der Walt & van Rensburg 2014: 131). Inclusion sampling criteria are characteristics that the subject or elements must possess to be part of the target population (Grove, Gray & Burns 2015:251).

In the study, only mothers of premature infants who could speak and understand English, and the mothers of premature babies who were involved in any oral feeding of their babies, by either a spoon, cup, syringe or bottle after the nasogastric tube feeding was removed from their babies were included. The criteria also included premature babies who had a birth weight of 1000 grams and more but less than 2.5 kg. The eligible staff of Sick Neonate ward in a district hospital included those who have fed the premature infant by any other oral means after a nasogastric tube feeding was removed.

3.3.3.2 Exclusion criteria of the target population

Exclusion criteria result in a population that is defined in terms of characteristics that people must not possess (Polit & Beck 2014: 380). These characteristics can cause a person or element to be excluded from the target population.

In this study, the premature infants who had a nasogastric tube feeding but had a birth weight of fewer than 1000 grams will be excluded. Mothers of premature infants who neither speak nor understand English will be excluded in the study. Staff members who initiated oral feeding to premature infants admitted or have developed a medical condition in the unit of a district hospital under study will not form part of the study.

3.3.4 Sampling

Sampling is the process of selecting cases to represent an entire population so that inferences about the population can be made (Polit & Beck 2012:274). According to Grove, Gray and Burns (2015:249), sampling involves selecting a group of people, events, objects, or other elements with which to conduct a study.

In this study, sampling was done using the admission book in which all babies are recorded in the unit. A sample was drawn from premature infants who were only admitted for weight gain, were fed with a nasogastric tube feed, and the nasogastric tube was removed, and oral feeding was commenced with a spoon, a cup, syringe or bottle.

3.3.5 Sampling Technique

It is also known as a sampling method, and it defines the selection process (Grove, Gray & Burns 2015 290). Sampling techniques are either classified as probability or non-probability sampling (Polit & Beck 2012:275).

3.3.5.1 Non- Probability sampling

Non-probability sampling is the selection of sampling units from a population using non-random procedures like convenience and quota sampling (Polit & Beck 2012: 735). This type of sampling is usually more convenient and economical and allows the study of populations when they are not amenable to probability sampling, or when the researcher is unable to locate the entire population (Brink, van der Walt & van Rensburg 2014 139). Convenient sampling involves the choice of readily available participants or study objects and is also known as accidental or availability sampling (Brink, van der Walt & van Rensburg 2014 140). The available staff of Sick Neonate ward and mothers of premature infants whose infants had a nasogastric tube feeding in the ward were selected as subjects

3.3.5.2 Convenience sampling

Convenience sampling is used when an ordered list of all members of the population is available, and each case has an equal chance to be selected. The sample is representative of the study population. The random procedure rigorously enables the researcher to generalise his findings. The population list under study is determined (sampling frame), and it must be randomly arranged. From the sampling frame, the elements are determined whereby a selection is made at the same intervals until the sample is reached. The advantage of this technique is that it is easy and convenient to use (Polit & Beck 2012: 284). Another and the further advantage of systematic random sampling is that it allows the researcher to estimate the magnitude of sampling error (Polit & Beck 2014:181).

3.3.5.3 Sample size

The sample size is the number of people who participated in a study (Polit & Beck 2014:181). In a quantitative, study it up to the advantage of the researcher's decision to have a larger population to choose a sample from. In larger sample representativeness, the generalisation of the findings will be achieved as the findings are more accurate (Brink, van der Walt & van Rensburg 2014: 143).

In the study, there will be 50 different categories of staff members, including different students in different year groups in the Sick Neonate unit in a district hospital. Fifty mothers of premature infants were selected. Correct sample size could only be identified with significant differences in the study (Burns & Grove 2011:308). The power analysis was used to evaluate the adequacy of sample size because power is the capacity to detect differences or relationships that exist in the population (Burns & Grove 2011:308). The adequacy of the sample size occurs only when no significance is found in the study (Burns & Grove 2015:266).

3.4 DATA COLLECTION

Data collection is the precise, systematic gathering of information relevant to the research purpose, or specific objectives, questions, or hypotheses of a study (Burns & Grove 2011:

52). Data collection methods vary according to the design. Research demands that each piece of data collected has a purpose that is related to the study's goal and is not collected as "nice to know "data (Brink, van der Walt & van Rensburg 2014:57). The actual steps of data collection are specific to each study and depend on selected research design and measuring methods that are used the researcher may use instruments such as observations, interviews, questionnaires or scales. The researcher may participate actively in the data collection process, or he might supervise the data collectors.

3.4.1 Data Collection Process

When planning the process of data collection, the researcher is guided by five important questions: What? How? Who? Where? and When? (Brink, van der Walt & van Rensburg 2014:146).

What type of data was collected?

The researcher carefully considers exactly what type of information is necessary to answer the research question. A decision can be taken regarding measurement scales as well. In this study, measurement scales will be used.

How were the data collected?

The researcher must use a research instrument to gather data. The choice of an instrument is a major decision that should be made after careful consideration of the alternatives. It is equally important that the manner of data capturing is reliable. Raw data should be stored in a safe place. In this study, self- report questionnaires will be used.

Who collected data?

The researcher will collect her own data.

Where were data collected?

The place of data collection can be decided upon - a district hospital in Ekurhuleni Region in the Gauteng Province.

When will data be collected?

The data were collected for eight months, taking into consideration different student placement in the Sick Neonate Unit. (Brink, van der Walt & van Rensburg 2014:147-149). The data collection process employed by the researcher should be objective, systematic and consistent.

Objectivity – this is the degree to which two independent researchers can arrive at similar "scores" or similar observations regarding the concepts of interest or make judgments regarding participant's attributes or behaviour that are not biased by personal feelings or beliefs.
Systematic – the data are collected in the same way by everyone who is involved in data gathering.

Consistency – consistency involves maintaining the data collection pattern for each collection event as it was developed in the research plan. Consistency is key to accurate data collection in any study. Researchers should note deviations, even if they are minor, and evaluate them for their impact on the interpretation of the findings (Grove, Gray & Burns 2015:362; Polit & Beck 2012:372).

3.4.2 Data Collection Technique

There is various data collection technique. The ones frequently used by health care professionals are observations, self- reports and physiological methods (Brink, van der Walt & van Rensburg 2014:150).

3.4.3 Data Collection Instrument

When the researcher's objective is to find out what people believe, think or know, the easiest and most effective method is to direct the question to the person concerned. The purpose of questions is to find out their thoughts, perceptions, attitudes, beliefs, feelings, motives, plans, experiences, knowledge levels and memories. A participant must answer the questions directly; these techniques are known as self-reports which include questionnaires, scales, and interviews (Brink, van der Walt & van Rensburg 2014:153).

In this study, questionnaires were chosen; these are printed self- reports forms which are designed to elicit information through written or verbal responses of the subjects. Questionnaires are sometimes referred to as surveys (Burns & Grove 2011:353). The data collection instrument was developed based on a literature search on the relevant topic. Reference was made to the WHO Guidelines on Maternal and neonatal care and the 2015 Maternity Guidelines in South Africa for Obstetricians, Paediatricians, Advanced Midwives and experienced midwives. The instrument was evaluated by colleagues who have done quantitative studies in their research for internal validity, external validity, content and face validity (Polit & Beck 2014: 377-380).

The researcher used questionnaires to collect data from mothers of premature infants in a district hospital at Ekurhuleni Region. The following were included in the questionnaire:

Section 1: Mother's demographic data

Section 2: Information about breastfeeding

Questionnaires were used to collect data from all staff of Sick Neonate Unit in the district hospital at Ekurhuleni Region. The questionnaires included the following:

Section 1: Staff member's demographic data

Section2: Care provided to premature infants who had a nasogastric tube and information regarding initiation of breastfeeding to premature infants other means of oral feeding.

The following are advantages of self- administered questionnaires:

- Questionnaires are less costly and require less time and energy to administer

- Unlike interviews, questionnaires offer the possibility of complete anonymity and are more likely to provide honest answers
- They are a quick way of obtaining data from a large group of people
- Questionnaires are one of the easiest research instruments to test for validity and reliability
- The format is standard for all participants and is not dependent on the mood of the researcher (Brink, van der Walt & van Rensburg 2014:153; Polit & Beck 2014:184-185)

3.4.3.1 Disadvantages of self- administered questionnaires

- Mailing of questionnaires may be expensive
- The response rate may be low
- Respondents may provide socially acceptable answers
- Respondents may fail to answer some of the questions
- There is no opportunity to clarify any questions that may be misunderstood by participants
- Participants must be literate
- The participants who respond may not be representative of the population
- Respondents commonly fail to mark responses on long questions
  (Brink, van der Walt & van Rensburg 2014:153; Polit & Beck 2014:185-186)

3.4.3.2 Advantages of self- administered questionnaires

- Questionnaires are a quick way of obtaining data from a large group of people
- They are less expensive in terms of time and money
- They are one of the easiest research instruments to test for reliability and validity
- Participants feel a greater sense of anonymity and are more likely to provide honest answers
- The format is standard for all participants and is not dependent on the mood of the interviewer (Brink, van der Walt & van Rensburg 2014: 153; Polit & Beck 2014:185-186)

3.4.4 Data Collection Process

Permission to collect data was granted by the Research and Ethics Committee of UNISA in the Department of Health Studies, Gauteng Health Research Ethics Committee Ekurhuleni Region. The district hospital management, where data were collected, also granted permission.

Data were collected in the hospital Sick Neonate Unit, at the Kangaroo Mother Care Unit and the Paediatric Outpatient department of the same hospital.

3.4.5 Administering Self- Administered Instruments

The data were collected by the researcher only to ensure consistency. The self-administered questionnaires were distributed to members of staff in the Sick Neonate Unit and to the mothers of premature infants who had a nasogastric feeding previously. All questionnaires that were distributed in the ward did not have individual names or any other means of identification to ensure confidentiality. The staff members and mothers of premature infants did not write their names on the questionnaires, only numbers were used on the questionnaires, but all respondents remained anonymous to the researcher.

3.5 DATA ANALYSIS

Data analysis entails categorising, ordering, manipulating and summarizing data, and describing them in meaningful terms (Brink, van der Walt & van Rensburg 2014:177). Data analysis is a systematic organisation and synthesis of research data (Polit & Beck 2014:378). The most powerful tool available to the researcher in quantitative data analysis is the statistics.

3.5.1 Descriptive Statistics

The researcher used the descriptive statistics to provide answers to the research questions, describe and summarise data. Descriptive statistics also called summary statistics and allowed the researcher to organise data in a meaningful way and facilitated the understanding of the data from various ways (Burns & Grove 2016:383).

The researcher has descriptive statistics to describe the characteristics of the sample from which the data were collected and to describe values obtained from the measurement of dependent variables.

Descriptive statistics were used in this study to describe and summarise data included frequency distribution, graphs and measures of central tendency and level of measurement.

The researcher was assisted by a professional statistician to analyse and summarise data.

3.5.2 Presentation of Descriptive Statistics

The data were grouped according to variables on the questionnaires and described in words. Frequency distribution tables, graphs, measures of central tendency and level of measurement were used to describe and effectively communicate the findings of a study.

3.6 RELIABILITY AND VALIDITY OF THE DATA COLLECTION TOOL

Reliability and validity of a study can be affected by many factors in data collection. The researcher must always try to produce quality research so that the results are more meaningful, to reflect reality as accurately as possible (Brink, van der Walt & van Rensburg 2014:163).

3.6.1 Random Errors

This type of error is an unpredictable error that is unsystematic in nature and results in inconsistent data. Random errors can disturb the relationship between variables and make them weaker than they really are and can affect the reliability of data. This type of error is caused by factors relating to the participant, the researcher, the environment and the instrument (Brink, van der Walt & van Rensburg 2014:164).

3.6.2 Systematic errors

These are a systematic, constant error, which consistently affects the measurement of the variable, in the same way, each time the measurements were done. These are non-random bias errors, which impacts on the reliability of measurement (LoBiondo-Wood & Haber 2010:271). In this study, the researcher has designed the data collection instrument bearing in mind to minimise these errors.

3.6.3 Reliability

Reliability of a quantitative instrument is a significant criterion for assessing its quality. Reliability is defined as the consistency of the measurement method (Grove, Gray & Burns, 2015:287). According to Polit and Beck (2012:331), reliability is the consistency with which the data collection instrument measures the target attribute. It is essential to perform reliability testing on each instrument used in a study before performing other statistical analysis. The degree to which a measurement is free from measurement error, its accuracy and consistency (Polit & Beck 2014:390). One of the aspects of reliability testing is its stability (Burns & Grove 2015:289).

3.6.3.1 Stability

Stability of an instrument is concerned with the consistency of repeated measures of the same attribute with the use of the same scale or instrument and is referred to as test-retest reliability. This measure of reliability was used in the study with paper-and-pencil scales (Grove, Gray & Burns 2015:289). The use of stability provided the researcher with an assumption that any change in the value or score to be measured because of random error. In the study, while piloting the instrument, same questionnaires were used to a group of postnatal mothers on factors associated with delayed initiation of breastfeeding, and the same results were obtained when an instrument was used on mothers of premature infants. **Piloting of an instrument was done.**

3.6.4 Validity

The validity of a data collection instrument determines whether an instrument accurately measures what it is supposed to measure, given the context in which it is applied (Brink, van der Walt & van Rensburg 2014:165). The validity of an instrument is a determination of how well the instrument reflects the abstract concept being examined. The validity, like reliability, is an all-or-nothing phenomenon; itis measured on a continuum. No instrument is completely valid (Grove, Gray & Burns 2015:290). Validity testing evaluates the use of an instrument for a specific group or purpose, rather than the instrument itself (Burns & Grove 2011:334). The common types of instrument validity are: construct content and face validity.

3.6.4.1 Construct validity

Construct validity is a key criterion for assessing the quality of a study (Polit & Beck 2012:339). Construct validity: It is used to explore the relationship of the instrument's results to measures of the underlying theoretical concepts of the instrument (Brink, van der Walt & van Rensburg 2014: 168).

3.6.4.1.1 Contrasted groups

This is also known as the "known groups approach". In the study, the contrasted group's approach was carried out by comparing two groups, whereby one group of mothers of premature infants strongly agreed initiating breastfeeding to their infants before discharge from hospital, and the other group strongly disagreed with the activity.

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3.6.4.2 Content validity

Content validity examines the extent to which the instrument includes all the significant elements relevant to the construct being measured (Grove, Gray & Burns 2015:335). According to Polit and Beck (2014:377), content validity concerns the degree to which an instrument has an appropriate sample of items for the construct being measured and adequately covers the construct domain. An instrument's content validity is necessarily based on judgement.

There are no completely objective methods of ensuring adequate content coverage on an instrument, but experts can be used to evaluate the content validity of a new instrument (Polit & Beck 2012: 37). The experts evaluate each item on the instrument, with regards to the degree to which the instrument measures, but also that which it does not measure (Brink, van der Walt & van Rensburg 2014:166).

In the study, Obstetricians, Paediatricians, Advanced Midwives and experienced midwives and doctors were approached for their inputs in the instrument. The researcher also did extensive reading during the design stage of the data collection tool. The Advanced Midwives and experienced midwives were consulted before data was collected in the hospital where the study was conducted. The Obstetricians and Paediatricians were also consulted in the same hospital, and one obstetrician was consulted in another academic hospital.

3.6.4.3 Face validity

Face validity refers to whether the instrument looks like it measures the target construct (Polit & Beck 2012:336). The extent to which an instrument seems as though it measures what it purports to measure (Polit & Beck, 2014:380). According to Brink, van der Walt and van Rensburg (2014: 166), face validity merely means that the instrument appears to measure what it is supposed to measure. Face validity is essentially based on an intuitive judgement made by experts in the field.

In the study experts in obstetrics, midwifery, paediatrics and neonatology were given the data collection instrument to assess objectivity to establish validity.

3.7 ETHICAL CONSIDERATIONS

The three fundamental ethical principles will be discussed in detail below:

Ethics is defined as a branch of philosophy called moral philosophy and addresses issues of human conduct that are of great importance to nurses and other health professionals.

It is concerned with the meaning of words such as right, wrong, good, bad, ought and duty). Particularly in nursing, ethics is concerned with specific moral problems that occur within the context of nursing practice.

In research, Ethics is defined as a system of moral values that is concerned with the degree to which research procedures adhere to professional, legal, and social obligations to the study participants (Polit & Beck 2012:727).

Ethics is a series of beliefs and principles held by a person or group about how to determine which human interactions they believe are right or wrong. These core beliefs are often interconnected and overlap with other value systems, religious views, legal systems, philosophies, social conventions and moral codes (Bycel 2013:1). In the context of research, ethics focuses on providing guidelines for researchers, reviewing and evaluating research, and establishing enforcement mechanisms to ensure ethical considerations.

Three fundamental ethical principles guide researchers during the research process: respect for persons, beneficence and justice. These principles are based on human rights that should be protected in research like the right to self-determination, privacy, anonymity and confidentiality, fair treatment and being protected from harm and discomfort (Brink, van der Walt & van Rensburg 2014:34).

3.7.1 Respect for Persons

Individuals are autonomous; they have the right to self-determination. This principle is also known as respect for human dignity. An individual has a right to decide whether to participate in a research study. They also had a right to withdraw from the study at any time, to refuse to give information and to ask for clarification about the study purpose. The researcher must respect these rights by avoiding using any form of coercion or penalty. The decision to participate must be voluntary (Brink, van der Walt & van Rensburg 2014:35).

The use of deception can also violate the participant's rights to self-determination. If deception is used in a study, the research report should indicate that the subjects were deceived, and were informed of the actual research activities and the findings at the end of study (Grove, Gray & Burns 2015:110).

In this study, the right to self-determination was respected by allowing mothers of premature infants and staff of Sick Neonate Unit to participate voluntarily. They were reassured that they could withdraw from the study at any time. Participants who refused to give information and those who were not comfortable to be part of the study were not forced to do so.

3.7.2 Beneficence

Beneficence is a researcher's duty to minimise harm and maximise benefits (Polit & Beck, 2012:152). The researcher needs to secure the participant's physical, psychological, emotional, spiritual, economic, social or legal rights. The participant's participation must be essential to achieving scientifically and socially important aims that could not otherwise be realised (Polit & Beck 2012:152).

The researcher used a non-experimental design, although information was collected from premature mothers and staff of Sick Neonate Unit, who were not subjected to any harm and discomfort of any nature during the study. Instead, these were prevented in this study. Institutional policies and organisational culture were respected during data collection in the hospital.

Emotional harm was addressed through the following:

- Consent to research obtained
- Protecting the anonymity and confidentiality of participants
- The right to withdraw from the study at any time
- Continuously monitor participant's reaction during data collection
- An informative debriefing at the end of the data collection session

3.7.3 Justice

Justice refers to the participant's right to fair selection and treatment. The researcher must select the participants directly related to the research problem, and not because they are readily available or can be easily manipulated (Brink, van der Walt & van Rensburg 2014:36).

The fair treatment principle covers issues other than participant selection. The right to fair treatment means that a researcher must treat people who decline to participate or who decline after an initial agreement in a non- prejudicial manner (Polit & Beck 2014:85).

Privacy is the freedom people have to determine the time, extent, and general circumstances under which their private information will be shared with withheld from others. Private information includes a person's attitudes, beliefs, behaviours, opinions and records. Invasion of privacy occurs when private information is shared without a person's knowledge or against their will (Grove, Gray & Burns 2015:98). Researchers should ensure that the participant's privacy is maintained throughout and continuously. Participant's data should be kept in strict confidence (Polit & Beck 2014:85). In this study, all participants were treated with fairness, whereby random sampling method was utilised.

Individual's personal information and their demographic data remained anonymous. All the information provided in the questionnaires was kept confidential and never shared with anyone throughout. All distributed questionnaires were completed by mothers of premature babies and staff of Sick Neonate Unit and were returned to the researcher without any identifying details.

3.8 CONCLUSION

This chapter explained the research design and methodology of the study in details. The three fundamental ethical principles were discussed and were adhered to during data collection.

Data analysis and presentation will be discussed in detail in Chapter 4.

CHAPTER 4

DATA ANALYSIS AND PRESENTATION

4.1 INTRODUCTION

This chapter discusses the analysis and presentation of data. In quantitative data analysis, different statistical methods are applied to the research variables, to enable the researcher to give meaning to study variables. The purpose of the study was to identify and describe factors which delay the initiation of breastfeeding to premature infants before discharge.

The objectives of the study were to:

- Identify and describe factors associated with the delay of initiation of breastfeeding to premature infants
- Explain the maternal factors related to delayed initiation of breastfeeding to premature infants
- Identify associated maternal factors with regard to lack of breastfeeding knowledge
- Explain factors associated with health services that lead to delayed initiation of breastfeeding to premature infants

The researcher chose a descriptive quantitative research design for the study, because these designs describe the variables in order to answer the research question, and may be used to identify problems with current practice, justify current practice and make judgments or determine what other professionals in similar situations are doing (Brink, van der Walt & van Rensburg 2014:112).

Data collection is the precise, systematic gathering of information relevant to the research purpose or specific objectives, questions or hypotheses of a study (Burns & Grove 2011:52). The researcher collected quantitative data on factors which delay the initiation of breastfeeding to premature infants before discharged using self-administered questionnaires. Questionnaires often used in descriptive studies to gather a broad spectrum of information from subjects, such as facts about persons, events, or situations known by the subjects (Grove, Gray & Burns 2015:305).

Data were collected from all staff working in the Sick Neonate Unit, and from mothers of premature infants in the same ward and those mothers whose premature infants were admitted in the Kangaroo care area in the hospital and at the Paediatric Out Patient Department. Data were collected between May of 2015 and January of 2016. The reason for the long duration of data collection was because of student allocation to a clinical facility or a hospital by the Nursing College affiliated to the hospital. This was done to allow categories of students to be allocated in the Sick Neonate Unit.

4.2 DATA MANAGEMENT AND ANALYSIS

Data analysis is the systematic organisation and synthesis of research data, and in quantitative studies, the testing of hypotheses using those data (Polit & Beck 2014:378). Data analysis entails categorising, ordering, manipulation and summarising the data, and describing them in meaningful terms. Descriptive statistics are used to convert, and condense a collection into an organised, visual representation, or picture, in a variety of ways so that the data have some meaning for the reader of the research report (Brink, van der Walt & van Rensburg 2014:179).

The researcher worked with the statistician who analysed the data using the descriptive statistics use a frequency distribution which is a systematic arrangement of values from lowest to highest, linked with the number of times the score occurs (Brink, van der Walt & van Rensburg 2014:180; Polit & Beck 2012:382). Frequencies were used in the classification of demographic data of staff of the Sick Neonate Unit which included their age groups, gender, marital status, designation (nursing category) and years of experience. They were also used in the demographic data of mothers of premature infants and included their age groups, marital status, education level, employment status and ages of their children. Pearson Chi was used in the association of lack of breastfeeding knowledge with maternal characteristics. The results were presented in graphs and tables.

4.2.1 Inferential statistics

Inferential statistics enable the researcher to infer from a sample to a large population and to estimate the population's parameters and to test hypotheses (Brink, van der Walt & van Rensburg 2014:190). These types of statistics are divided into parametric and non-parametric statistics.

4.2.1.1 Non- parametric statistics

Non- parametric statistics are referred to as distribution-free statistical tests because they are applied to data where assumptions are made regarding the normal distribution of the targeted population (Brink, van der Walt & van Rensburg 2014:191). The Chi-square which is the distribution of the sum of squared standard normal deviates (Brink, van der Walt & van Rensburg 2014: 191) was used to analyse the association of lack of breastfeeding knowledge with maternal characteristics.

4.2.1.1.1 Analysis triangulation

The use of more than one analytical technique to analyse data. In this study, data were analysed using frequency distribution tables, a pie chart, histogram and Pearson Chi. Biasness: was addressed using triangulation: whereby multiple methods were used to collect and interpret data.

The results are discussed in the following sections.

4.3 SECTION A: SOCIODEMOGRAPHIC FACTORS OF STAFF

Sociodemographic factors of staff of Sick Neonate Unit included age groups, gender, marital status, designation and years of experience of the staff in the unit.

4.3.1 Age (n = 50)

The staff of the Neonate Unit's age was between 22 and 60. Table 1 indicates the age distribution of all staff in the unit.

In an American study done by Bozzette, Ahmed and Bentz (2011:364) found that young nursing staff had decreased breastfeeding knowledge when compared to senior and older students and other staff members

Table 4.1: Sociodemographic characteristics of staff (n = 50)

	Frequency (n)	**Percentage (%)**
Age groups		
22-25	10	20.0
26-30	11	22.0
31-40	15	30.0
41-50	12	24.0
50-60	2	4.0
Total	50	100.0
Gender		
Female	45	90.0
Male	5	10.0
Total	50	100.0
Marital status		
Divorced	1	2.0
Married	16	32.0
Single	31	62.0
Widowed	2	4.0
Total	50	100.0
Occupation		
RN&M	9	18.0
RN Community Service	1	2.0
D4:4 Midwiferystudent	21	42.0
E/N	6	12.0
E/N/A	12	24.0
Total	50	100.0
Years of Work Experience		
1- 5	37	74.0
6-10	9	18.0
11-15	2	4.0
21-30	2	4.0
Total	50	100.0

There were 50 staff members who completed questionnaires, 15(f=30%) were 31-40 years old; 12 (f=24%) were between 41-50 years; 11 (f=22%) were 26-30 years old; 10 (f=20%); 2(f=4%) 50-60 years of age. Many staff members were between the ages of 31 and 40.

The relationship between staff age and the outcome of the study was that there were more middle-aged staff members in the sick neonate unit and a few older members.

4.3.2 Gender (n=50)

Table 1 indicates the staff gender. Of the 50 staff members 45 (f=90%) were females and 5 (f=10) were males. Gender played a part in supporting and motivating women initiate breastfeeding to their premature infants before discharge. A South African study of Swarts, Kruger and Dolman (2010:32) has shown that women are a source of valuable breastfeeding information to one another. Another study in Saudi Arabia by Amin (2014:102) reported that midwives and staff who breastfed their babies could easily assist premature mothers to initiate breastfeeding.

4.3.3 Marital Status (n=50)

Out of 50 staff members 31 (f=62%) were single; 16 (f=32%) were married; 2 (f=4.0%) were widowed and 1 (f=2.0%) was divorced. A Saudi Arabian study by Amin (2014:16) has reported that married students and staff members had a better understanding of breastfeeding and its benefits and were more likely to assist mothers with breastfeeding initiation.

4.3.4 Designation (n=50)

Designation of nursing staff is associated with delay of initiation of breastfeeding to premature infants, because the time and interest of staff members to guiding and assisting mothers of premature infants with breastfeeding, 21 (f=42%) were D4: four Midwifery students allocated in the ward; 12 (f=24%) were Enrolled Nursing Auxiliaries; nine (f=18%) were Registered Nurses with a qualification in Midwifery; 6 (f=12) were Enrolled Nurses and 1 (f=2.0%).

A Saudi Arabian study done by Amin (2014:107) has found that more qualified staff and students in their advanced years of training and education had a higher positive and better insight towards breastfeeding. An American study by Vandewark (2014:136) found that more qualified staff has a better knowledge of breastfeeding than students.

4.3.5 years of work experience (n=50)

The table shows more staff members were between one and five years experienced 37 (f= 74%); six -10 years of experience 9 (f=18%); 11-15 years of experience two (f=4.0%); 21-30 years two (f=4.0%) and 0-1 only one (f=2.0%). Vandewark (2014:138) reported increased knowledge with progression in nursing studies and senior staff members reported to be more knowledgeable in breastfeeding than new staff in the ward.

4.4 SOCIODEMOGRAPHIC CHARACTERISTICS OF MOTHERS

Socio-demographic characteristics of premature mothers covered age, marital status, education level, employment status and ages of their children see Table 2

Table 4.2: Sociodemographic characteristics of mothers

	Frequency (n)	**Percentages (%)**
Age groups		
18-22	9	18.4
23-27	23	46.9
28-32	8	16.3
33-37	3	6.1
38 and above	5	10.2
Total	48	97.5
Marital status		
Married	13	26.5
Single	36	73.5
Total	49	100
Education level		
Grade1-7	4	8.2
Grade8-12	34	69.4

Tertiary	11	22.4
Total	49	100
Employment Status		
Employed	8	16.3
Professional	1	2
Scholar	5	10.2
Unemployed	34	69.4
Total	48	97.5
Ages of their children		
1to5	7	14.3
1to10	1	2
1to18	3	6.1
6to10	7	14.3
6to18	1	2
11to18	3	6.1
11to25	2	4.1
19to25	1	2
Total	25	50.9

4.4.1 Age Groups (n=48)

The mothers of premature infants were categorised according to age groups ranging from 18 to 38 and above. 23 (f=46.9%) were aged 23-27; nine (f=18.4%) were 18-22; 8 (f=16.3%) 28-32; five (f=10.2%) 38 and above; three (f=6.1%). A study done in Japan by Kitano, Nomura, Murakami, Ohkubo, Ueno and Sugimoto (2016:121-123) found that maternal age is significantly associated with the initiation of breastfeeding because young mothers are at an increased risk of early breastfeeding cessation and less likely to breastfeed their babies because of alcohol and drug abuse.

4.4.2 Marital Status (n=49)

The maternal marital status influences the initiation of breastfeeding to their infant. The findings revealed that 36 (f=73.5%) were single, and 13 (f=26.5) were married.

A study by Gibson-Davis and Brooks-Gunn (2009:499) reported an association of couple's relationship status and quality with breastfeeding initiation because married mothers were more likely to breastfeed with the support of the partner than unmarried mothers.

4.4.3 Education Level (n= 49)

The level of maternal education played a part in early initiation of breastfeeding to their infants because more mothers had been educated from Grade 8-12 34 (f=69.4%); 11 (f=22.4%) had tertiary education, and four (f=8.2%) were in the Grades of 1-7. A study by Shahla, Fahy and Kable (2010:139) demonstrated that education level of the mother does affect her breastfeeding practices, uneducated and undereducated women lack knowledge of breastfeeding and only rely on their mothers, grandmothers and friends as a source of breastfeeding information. Their socioeconomic background limits them from accessing other sources of information.

4.4.4 Employment Status (n= 48)

Employment status of the premature infant's mothers showed that more mothers were unemployed 34 (f=69>4%); eight (f=16.3%) were employed; five (f=10.2%) scholars; 1(f=2%) was a professional. An American study by Kim, Fiose and Donovan (2017: 158) found that employment can be a barrier against breastfeeding where mothers reported cessation of breastfeeding on return to their work. Petry (2013:24), in an American study, found that women from low socioeconomic background lacked knowledge about breastfeeding and minimally or never initiate breastfeeding because of the high rate of drug and substance abuse, alcohol intake, and smoking which is believed to harm the baby through breast milk. Her study also found that unemployed women would rather breastfeed their infants due to lack of money to buy formula and other non-breastfeeding methods.

4.4.5 Ages of Their Other Children (n= 25)

The data in Table 2 showed that ages of mother's children played a part in the mother's initiation of breastfeeding to her premature infant because mothers who had older children showed less association with factors that delay breastfeeding, whereas mothers with younger children were more likely to delay initiation of breastfeeding.

Ages of mother's children showed that 24 (f=49) was missing information from the mothers. 7 (f=14.3%) mothers had children between the ages of 1-5; another seven(f=14.3%) had children in the ages of 6-10; three (f= 6.1%) had children in the range of 1-18; 3 (f= 14.3%) between 11-18 years; one (f=2%) 1=10 and 2 (f=4.1%) 11-25 years, one (f=2%) 1-10, one (f=2%) 6-18 and one (f=2%) 1-25.

4.5 SECTION B: HEALTH SERVICE FACTORS

Health Services factors are those factors which involved staff in the Sick Neonate Unit where premature infants received care. These factors were more about the staff perceptions regarding breastfeeding practices for the premature infants, and the following: staff views about breastfeeding a premature infant, staff current feelings about breastfeeding a premature infant before discharged, the importance of starting breastfeeding before an infant is discharged, other methods of premature infant feeding, using other convenient methods of feeding, mother support about breastfeeding, giving breastfeeding and other methods of infant feeding, staff views about delaying breastfeeding. All the above health services factors are shown in Table 3.

Table 4.3: Staff perceptions regarding breastfeeding practices for premature infants.

		Frequency (n)	**Percentage (%)**
Staff views about breastfeeding a premature infant (rating scale)	Positive Neutral Negative Does not know	27 11 7 2	54.0 22.0 14.0 4.0
	Total	**47**	**94**
Staff current feeling about breastfeeding a premature infant before discharge (rating scale)	The same Changed Neutral Uncertain	21 15 8 2	42.0 30.0 16.0 4.0
	Total	**46**	**92**
Staff asked if it is important to start breastfeeding before discharge (rating scale)	Agree Strongly agree Disagree Strongly disagree	22 15 9 4	44.0 30.0 18.0 8.0
	Total	**50**	**100.0**
Staff asked about other methods of infant feeding (rating scale)	Disagree Agree Strongly agree Strongly disagree	15 17 9 9	30.0 34.0 18.0 18.0
	Total	**50**	**100.0**
Staff asked about using other convenient feeding methods (rating scale)	Disagree Agree Strongly disagree	18 16 7 6	36.0 32.0 14.0 12.0

		Frequency (n)	Percentage (%)
	Strongly agree		
	Total	**47**	**94**
Staff asked about the importance of mother support with breastfeeding (rating scale)	Agree Strongly agree Disagree Strongly disagree	22 18 7 1	44.0 36.0 14.0 2.0
	Total	**48**	**96**
Staff asked about giving breastfeeding and other methods of infant feeding (rating scale)	Disagree Strongly disagree Strongly agree Agree	19 11 9 7	38.0 22.0 18.0 14.0
	Total	**46**	**92**
Staff views about delayed breastfeeding leading to nutrition deficiency (rating scale)	Agree Disagree Strongly agree Strongly disagree	21 15 7 6	42.00 30.00 14.0 12.0
	Total	**49**	**98**

4.5.1 The Staff Views About Breastfeeding A Premature Infant (n=47)

Staff members were asked about their views towards breastfeeding to a positive view of breastfeeding, 11(f=22.0%). These findings are supported by a study done by Gleeson, Flowers and Fernick (2014:219) which emphasise the midwife's attitude being an important factor to promote breastfeeding. 11 (f=22.0%) were neutral, seven (f=14.0%),

and two (f=4.0%) did not know as evidenced by a study done by Entwistle, Kendall and Mead (2009:229) where midwife's lack of adequate knowledge about breastfeeding and their negative attitude towards breastfeeding. In their study, midwives felt unprepared to support women to breastfeeding.

4.5.2 The Staff Current Feelings about Breastfeeding A Premature Infant before Discharge (n=46)

Staff were asked if premature infants should start breastfeeding immediately after removal of the nasogastric tube and before discharge from the hospital. Twenty-one (f=42.0%) reported still feeling positive about breastfeeding, 15 (f=30.0%) felt a change in attitude if they were negative; they then felt positive about breastfeeding a premature infant. This positive feeling was also found by Entwistle, Kendall and Mead (2009:235) when they noted that educationist needs to ensure that training programmes are designed to equip students and other health care professionals with necessary skills and knowledge to bring about a large change in professional practice to motivate and empower women with breastfeeding. This was also confirmed by a study of Vandewark (2014:13) which examined relationship and change between breastfeeding knowledge and attitudes in nursing students and found that knowledge scores increased with progression in nursing studies and that senior students reported being more knowledgeable about breastfeeding after their nursing education. Eight (f=16.0%) were neutral about their current feelings about breastfeeding, four (f=8.0%) were uncertain about their feelings. This was true with the study of Ahmed and Sands (2010:55) who reported that student's attitudes of breastfeeding were unexpectedly neutral after the adequacy of breastfeeding knowledge was assessed. Two (f=4%) uncertain.

4.5.3 The Staff Were Asked About Importance of Initiating Breastfeeding Before the Infant Is Discharged (Rating Scale) (n=50)

Of the 48 staff members, 22 (f=44.0%) verbalised that they agree that breastfeeding should be initiated before the infant is discharged, 15(f=30.0%) reported agreeing strongly. This was supported by a study done by Yang, Salamonson, Burns and Schmied (2018:39) who found that health professionals including nursing students do not always receive adequate breastfeeding education during their foundation education programme

to effectively help mothers. According to these researchers timing of maternal and child health curriculum component, previous personal breastfeeding experience, gender, cultural practices and government legislation were all factors found to influence breastfeeding knowledge and attitudes. Nursing curriculum, specialised programmes that emphasise the importance of breastfeeding initiation can improve breastfeeding knowledge, student's attitudes and confidence in helping and guiding breastfeeding mothers. Nine (f=18.0%) staff members disagreed and four (f=8.0%) strongly disagreed respectively.

4.5.4 The Staff Were Asked About Other Methods of Infant Feeding (Rating Scale) (n=50)

Staff were asked about other methods of infant feeding that could be used to feed a premature infant because at 30-34 weeks gestation sucking and swallowing reflexes are underdeveloped. Eighteen(f=36.0%) staff members strongly disagreed, 17 (f=34.0%) agreed and nine (f=18.0%) strongly agreed, three (f=6.0%) strongly disagreed. A study done in Denmark by Maastrup, Hansen, Boiesen, Hallum, Frandsen, Keyhnaeb, Svarer and Hallstrom (2014:76) reported that premature and full-term infants-initiated breastfeeding within a few days post, delivery depending on their physical condition. They found that minimising the use of a pacifier during breastfeeding transition was associated with the earlier establishment of breastfeeding some of their reasons being: Danish Neonatal Intensive Care high priority of breastfeeding. Skin-to-skin contact between mother and their preterm infant, expressed breast milk for nasogastric tube feeding, parental presence all the time, restricted use of other methods including bottle feeding and the Danish cultural norm of breastfeeding initiation. Another study was done in Brazil by Lopez and Gonsalves da Silva (2012:25) and also supports early breastfeeding initiation of premature infants through skin-to-skin and positive correlation with breastfeeding ability on discharge; using a nasogastric tube pacifier significantly supports breastfeeding ability by hospital discharge and continued breastfeeding.

4.5.5 The Staff Were Asked About Convenient Methods of Infant Feeding (Rating Scale) (n=47)

The staff of Sick Neonate Unit were asked about infant feeding methods that are more convenient for the staff because they are not time-wasting. Eighteen (f=36.0%) members of staff disagreed with the other convenient methods, 16 (f=32.0%) agreed, seven (f=14.0%) strongly disagreed to methods and six(f=12.0%) strongly agreed. The high percentage of staff who disagreed with conventional methods are supported by a study done in Brazil by Cricco-Lizza (2016:95) who identified the following: evidence-based breastfeeding beliefs for mothers and their babies, breastfeeding has beliefs with more emotions about day-to-day challenges, yet formula feeding evoked fewer emotions, and most nurses viewed it as safe and convenient, breastfeeding evoked emotions of anxiety, embarrassment and frustration in neonatal care units. Nurses with breastfeeding training were more committed to breastfeeding promotion. Another study by Guevara (2017:1022) in North Carolina USA, emphasised that evidence showed that educating healthcare professionals who have contacts with breastfeeding and lactating women can positively enhance breastfeeding initiation and duration.

4.5.6 The Staff Asked About Giving Breastfeeding and Other Methods of Infant Feeding (Rating Scale) (n=46)

Staff members were asked about giving a premature infant breastfeeding and use other infant feeding methods. Nineteen (f=38.0%) staff members disagreed, 11 (f=22.0%) strongly disagreed, nine (f=18.0%) strongly agreed, seven(f=14.0%) agreed. A British study by O'Brien, Myles and Prichard (2017:225) highlighted that bottle feeding in other instances was used to allow a breastfeeding mother a break, this also allowed others to help with infant feeding especially fathers. Their study also revealed that bottle feeding was used as "taking a turn in infant feeding", which was more obvious during the night feedings. In their qualitative study women verbalised that if men are not involved in baby feeding, it would be difficult for them to bond with their infants. Other barriers to breastfeeding were also mentioned, like a sick baby that cannot latch at that time. A study done in Kwa-Zulu Natal by Swarts, Kruger and Dolman (2010:45) reported that 42 per cent of women chose to breastfeed for the first six months, then switched to formula feeding and were not influenced by anyone in their decision.

Some the decision was based on positive HIV status. McCrory and Murray (2018:1685), warned about alternative feeding methods like a cup, spoon, syringe and bottle, they stressed the fact that mothers choosing the above should receive adequate information and be taught about the correct technique to use, and should feel comfortable using them.

4.5.7 The Staff Asked About Importance of Mother Support with Breastfeeding (Rating Scale) (n=48)

The staff were asked if mothers of premature infants who had a nasogastric tube feed receive any support from the staff with regards to the initiation of breastfeeding. Of the 50 staff members, 22 (f=44.0%) agreed to mother support by staff, 18 (f=36.0%) strongly agreed to the statement, and only seven (f=14.0%) disagreed, with one(f=2.0%) strongly disagreeing. An Australian study of Gleeson, Flowers and Fernick (2014:222) found that postnatal women spoke very positively of midwives who spent time with them and helped them figure out what they needed to do, midwives created a sense of time and space, focused on the woman and her breastfeeding experience made women felt best assisted. Women in their study also verbalised that it was the emotional support, assistance and advice provided that made their view of time spent is positive.

In contrast, when midwives appeared unavailable, women struggled in their effort to solve breastfeeding problems and early ups and downs of being a new breastfeeding mother. Midwives busyness were perceived by women being problems that were normalised or dismissed. Another Australian study of Rayner, Forster, McLachlan, Yelland and Davey (2008:1997) found that midwives identified organisational barriers on staffing issues, busy and chaotic nature of wards as time limiting and barriers to the provision of support.

4.5.8 The Staff Were Asked About Their Views That Delayed Breastfeeding Leads to Nutrition Deficiency (n=49)

Delayed initiation of breastfeeding has been linked to nutrition deficiency in the infant. The staff of the Neonate unit were asked to voice their views on delayed initiation of breastfeeding to premature infants and the fact that leads to nutrition deficiency in the infant.

The response was 21(f=22.0%) agreed, and this was evidenced in the study of micronutrient deficiencies among breastfeeding infants in Tanzania by Mucheru (2016:227). In achieving the new Sustainable Developmental Goals (SDGs), a significant reduction in under-five mortality and neonatal mortality must be achieved. South Africa is one of the Sub Saharan countries where neonatal and infant mortality still accounts for more child deaths. Fifteen (f=30.0%) disagreed, seven (f=14.0%) strongly agreed and six (f=12.0%) strongly disagreed. A Tanzanian study was done by Bellows, Smith, Muhihi, Briegleb, Noor, Mshamu, Sudfeld, Masania and Fawzi (2017:1256) found that infant mortality accounted for many child deaths in Tanzania, and malnutrition was an important underlying cause (Bellows et al. 2017:1258). The study found that predictors of infant vitamin D deficiency were birth weight and maternal urban residence. Vitamin 12 deficiency was also related to delayed initiation of breastfeeding to premature infants.

4.5.9 The Staff Were Asked About the Appropriate Gestation Age to Initiate Breastfeeding in a Premature Infant (n=49.8)

The question of the appropriate gestation to initiate breastfeeding was not an easy one to answer by staff.

The majority of staff members, 32 (64.0%), indicated that the appropriate gestation age to initiate breastfeeding on a premature infant is 34-37 weeks, and 36 (72%) of staff agreed that the infant's swallowing reflex is ready at that same gestation age. A Danish study of Maastrup et al. (2014:78) confirms the above information. Out of 49.8, 11 (22%) of the staff recommends the premature infant initiate breastfeeding at 30-32 weeks of gestation, and 12 (24%) of them supports the fact that swallowing reflex is functional at that age of a premature infant. Six (12%) of women agreed that the baby could be breastfed at 26-29 weeks of gestation, and only two (4%) supports the readiness of the infant's reflex. The Danish study by Maastrup et al. (2014:85) reported premature infants as young as 24-27 gestation were breastfeeding exclusively. This study also compared infant's exclusive breastfeeding, partial breastfeeding and not breastfeeding at all. Their findings clearly showed 76 per cent of infants exclusively breastfeeding at 32-34 weeks of gestation.

Another study by Brier, McGrath, Cong and Cusson (2015:8) in the USA found that in establishing breastfeeding with premature infants in the Neonatal Intensive Care Unit, it is necessary to do a physiological assessment for readiness and in initiate breastfeeding as soon as clinically possible. Direct breastfeeding should be the infant's first oral feeding after removal of a nasogastric tube, or after the infant's recovery from acute illness.

Appropriate gestation age and infant's reflexes to initiate breastfeeding.

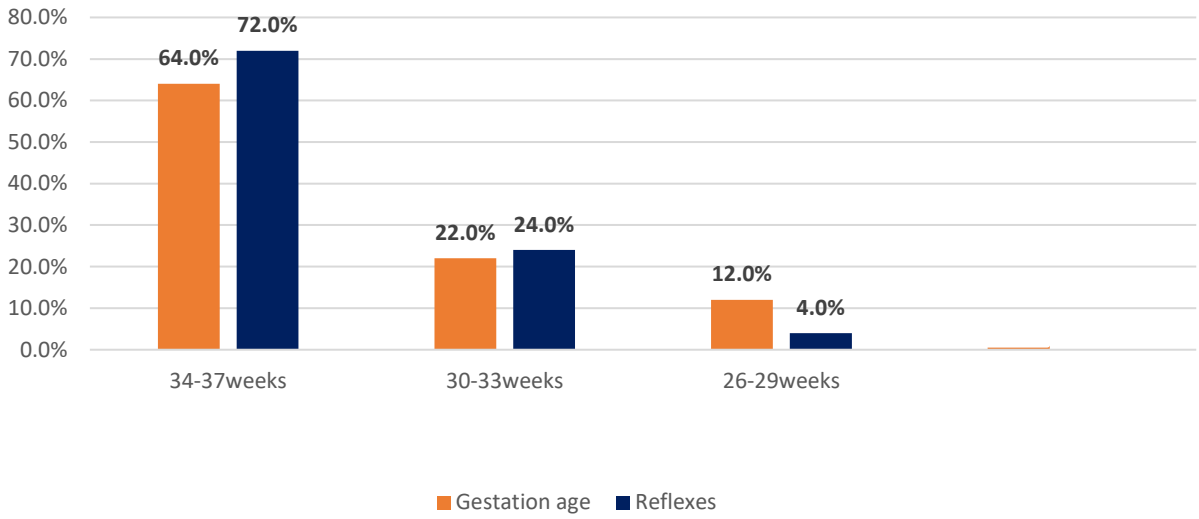

Figure 4.1: Gestation age and reflexes

4.5.10 The Staff Were Asked About the Number of Times They Assisted the Premature Infant Mother with Breastfeeding (n=50)

The staff, when asked about the number of times they assisted premature mothers with breastfeeding. A significant percentage of staff members showed varying times in which mothers were assisted with breastfeeding in more than only once, as shown in Figure 4.2.

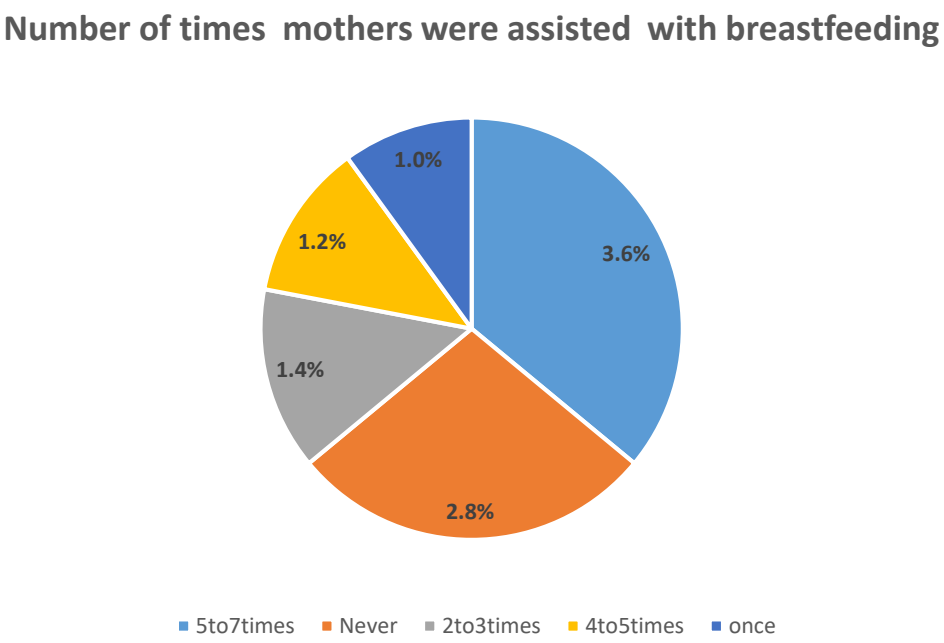

Figure 4.2: Number of times the mothers were assisted with breastfeeding(n=50)

The staff was asked to indicate the number of times assistance was given to the mother with breastfeeding her premature infant. Figure 2 showed that out of 50 staff members who took part in the survey, 18 (f=36%) of the staff assisted mothers with breastfeeding five to seven times in two weeks, which was the maximum period spent with the woman. This practice is true and common, and it is evidenced in the Australian study of Gleeson, Flowers and Fenwick (2014:222) which found that midwives who spent time with women were highly valued, conversely, midwives' busyness and inability to be present to assist women was considered a barrier to breastfeeding support. Fourteen (f=28%) of them never assisted mothers with breastfeeding. This practice was reported in another Australian study done by Schmied, Beake, Sheehan, McCourt and Dykes (2011:56) which reported that the midwife's work environment was to blame rather than the midwives themselves, women reported that midwives "looked busy" and commonly stated that they were indeed busy and understaffed. This concept has resulted in midwives consistently raised concerns about time pressures in postneonatal wards leading to mothers reported feeling guilty and reluctant to ask for help (Schmied et al.2011:52), 7(f=14%) were able to help mothers only two to three times, six(f=12%) provided assistance to mothers four to five times and five(f=10%) provided assistance only once.

4.5.11 Challenges of Health Service Factors (n=8)

The staff were asked about challenges they faced and were able to deal with successfully when they initiated breastfeeding to a premature infant after removal of a nasogastric tube. These challenges are reflected in Table 2.

Table 4.4: Challenges of health service factors (n=8)

	Frequency	**Percentages**
Breastfeeding after removal of nasogastric tube	3	38.0
The bond between mother and infant	2	25.0
Time-consuming	2	25.0
Mother very enthusiastic	1	13.0
Total	**8**	**100.0**

Out of a total of eight challenges, three (f=38.0) were those who stated that breastfeeding should be started after the removal of nasogastric tube feeding, and the baby should not be tried on any other feeding method. A British study by O'Brien, Myles and Prichard (2017:224) found that the baby becomes confused when breastfeeding is continued with bottle feeding at the same. Two (f=25.0%) observed the bond between mother and baby is strengthened. Two (f=25.0%) reported that it was time-consuming to help the mother put her baby on breastfeeding for the first time and one (f=13.0%) verbalised that the mother was very enthusiastic about feeding her frequently every time the baby wanted to.

4.5.11.1 Staff reasons for not initiating breastfeeding (n=13)

The staff were asked to mention as many as possible reasons for not initiating breastfeeding to premature infants. A list of common reasons was listed for them to choose from.

Table 4.5: Staff reasons for not initiating breastfeeding

Reasons for not initiating breastfeeding (n=13)	Frequency	Percentages	
High Care/Intensive Care Unit with Medical condition	5	38	
High Care/Intensive Care Unit with Other Conditions	3	23	
Lack of transport and money	3	23	
All of the above	2	15.3	
Total	**13**	**100**	

Table 5 shows that an increased number of staff, five (f=38%) mentioned infant's admission to High Care, or Neonatal Intensive Care Unit (NICU) with a medical condition being the main reason not initiating breastfeeding. A study of O'Brien and Myles on when a sick baby with Necrotizing Enterocolitis when a baby is admitted in NICU. Three (f=23%) mentioned an infant admitted in NICU or High Care for a more extended period with other conditions. Three (f=23%) talked about mothers who are not able to visit their premature infants frequently in the hospital due to lack of transport and money, and one (f=15.3%) mentioned all of the above reasons as barriers to breastfeeding initiation.

4.6 SECTION C: MATERNAL BREASTFEEDING FACTORS/PRACTICES

Mothers were assessed for maternal breastfeeding practices or factors relating to breastfeeding knowledge, childbirth order in terms of breastfeeding, sources of breastfeeding information, their feelings about breastfeeding before breastfeeding their own baby, feelings about breastfeeding afterwards, breastfeeding other children, benefits of breastfeeding, other methods of breastfeeding, breastfeeding seen as time-wasting, other prohibiting reasons, delayed breastfeeding, preferred method of infant feeding, breastfeeding assistance and support given to the mother.

Table 4.6: Maternal breastfeeding factors/practices (n=49)

	Frequency (n)	Percentage (%)
Breastfeeding knowledge		
No	48	98.0
Yes	1	2.0
Total	49	100.0
Child Birth order in terms of breastfeeding		

	Frequency (n)	Percentage (%)
0	20	40.8
1	10	20.4
2	8	16.3
3	4	8.2
4	3	6.1
Total	**45**	**91.8**
Sources of breastfeeding information		
Clinic sister	33	67.3
Own mother	9	18.4
All sources	6	12.2
Total	**48**	**97.9**
Feelings about breastfeeding before		
Positive	32	65.5
Neutral	7	14.3
Negative	5	10.2
I do not know	4	8.1
Total	**48**	**98.1**
Feelings about breastfeeding now		
The same	28	57.1
Changed	17	34.7
Uncertain	2	4.1
Total	**47**	**95.9**
Breastfeeding other children		
No	17	34.7
Yes	17	34.7
Total	**34**	**69.4**

Benefits of breastfeeding		
Yes	45	91.8

No	1	2.0
Total	**46**	**93.8**
Other methods of infant feeding		
Bottle	18	36.7
Cup	11	22.4
Syringe	5	10.2
None of the above	3	6.1
Total	**37**	**75.4**
Breastfeeding believed to be time-wasting		
Disagree	35	71.4
Agree	8	16.3
Strongly agree	5	10.2
Total	**49**	**97.9**

Other feeding methods should be prohibited		
Agree	17	34.7
Strongly agree	12	24.5
Disagree	8	16.3
Strongly disagree	7	14.2
Total	**44**	**89.7**
Delayed breastfeeding and nutrition-deficient		
Strongly agree	21	42.9
Agree	6	32.7
Disagree	9	18.4
Total	**36**	**94**
The preferred method of infant feeding		
Breastfeeding	27	55.1
Cup	13	26.5
Bottle	5	10.2
Syringe	4	8.2

Total	**49**	**100**
Breastfeeding assistance		
Ward sister	42	85.7
Own mother	6	12.2
Total	**48**	**97.9**
The support given to the mother of a premature infant		
No	48	98.0
Yes	1	2.0
Total	**49**	**100.0**

4.6.1 Mother's Breastfeeding Knowledge (n=49)

Table 6 showed that 48 (f=98.0%) of women did not know about breastfeeding; only one (2.0%) verbalised having breastfeeding knowledge.

4.6.2 Child Birth Order in Terms of Breastfeeding (n=45)

Women who had no children did not practice breastfeeding before the birth of their first baby 20 (f=40.8%) 10 (f=20,4%) breastfed their first child, eight (f=16.3 breastfed both of their children, four(f=8.3%) breastfed all three of her children, three(f=6.1%) breastfed four of her children..

4.6.3 Sources of Breastfeeding Information (N=48)

Women verbalized getting information about breastfeeding from a variety of sources 33 (f= 67.3%) got information from clinic sister, nine (f=18.4%) got information from their own mother, six (f=12.2%) from all other sources and one (f=2.0%). A study of Radzyminski and Callister (2016:25) indicated that women get breastfeeding information from a variety of sources including their own mother, friends, magazines, newspapers, television and other sources.

4.6.4 Maternal Feeling before Breastfeeding their Infant (n-48)

Thirty-two mothers (f=65.5%) felt positive about breastfeeding after breastfeeding their own baby, seven(f=14.3%) felt neutral, five(f=10.2%) did not know how they felt.

4.6.5 Maternal Feeling after Breastfeeding Their First Baby (n=47)

Twenty-eight (f=41.0%) mothers, reported feeling the same after the initial breastfeeding of their first baby, 17 (f=34.7%) mothers reported a change in their feeling, two(f=4.1%) were uncertain about their feeling. A study of Kitano et al. (2016:122) found that nulliparas women would reflect on each breastfeeding of the current experience, whereas multiparous women would reflect on all previous breastfeeding experiences and are more positive about breastfeeding.

4.6.6 Breastfeeding Other Children (n=34)

Breastfeeding other children entailed breastfeeding other children other than the current baby that the woman had. This involved breastfeeding some or all of their children. They were instructed to respond with a Yes or No. Seventeen (f=34.7%) responded positively, and another 17 (f=34.7%) responded negatively. Some of the reasons for not breastfeeding were: mother's milk was like water, milk was not coming out, blood oozing from the nipple. This was also the case in the study done by O'Brien, Myles and Prichard (2017:224) who reported women experiencing pain when the baby latches on the breast. A study done in Sudan by Brockway, Benzies, Carr and Aziz (2018:43) reported that due to maternal negative cultural beliefs, colostrum was discarded because mothers thought it was dirty and bad.

4.6.7 Knowledge of Benefits of Breastfeeding (n=46)

Table 6 reflected that a significant number of women who were asked this question responded positively 45 (f=91.8%) knew about breastfeeding benefits, followed by only one (f=2.0%) woman who did not know with.

4.6.8 Other Methods of Infant Feeding (n=37)

Women were asked to mention other methods of infant they knew of and had used in the past 18 (f=36.2%) women had used bottle feeding in the past followed by 11 (22.4%) who had used a cup to feed their infants, five (f=10.2%) used a syringe and three(f=6.1%) women who mentioned they did not use any of the above methods. A Brazilian study of Cricco-Lizza (2016:97) found that women preferred formula feeding to breastfeeding, because the latter evoked fewer emotions and most health care workers viewed it as safe and convenient.

4.6.9 Breastfeeding Believed to be Time Wasting (n=49)

More women would not choose to breastfeed because they believed that breastfeeding would spoil their breasts or make their breasts ‘saggy” and it is time-wasting. In Figure 6, 35 (f=71.4%)disagreed with the statement, eight (f=16.3%) agreed, and five (F+10.2%) strongly agreed to the statement above, The British study of O’Brien, Myles and Prichard (2017:225), confirms this notion when they found that some women would not breastfeed their babies because their breasts would be “saggy”, and also felt that breastfeeding needed more time from them, hence they chose formula feeding. .

4.6.10 Other Feeding Methods Should Be Prohibited (n=44)

Mothers of premature infants were asked if other methods of breastfeeding should be prohibited on a premature before discharged from the hospital. An overwhelming response was reported that they agreed 17 (f=34.7%), 12 (f=24.5%) strongly agreed, which was confirmed by the Danish study by Maastrup et al. (2014:79) who suggested avoiding exposure of other feeding methods to the mother during the transition period from nasogastric to successful initiation and sustainable breastfeeding. Eight (f=16.3%) mothers disagreed and seven (f=14,2%) strongly disagreed

4.6.11 Delayed Breastfeeding and Nutrition Deficiency (n=36)

Mothers of premature infants were assessed about knowledge of delayed breastfeeding and nutrition deficiency in the infant.

Mothers knew that failure to breastfeed your baby leads to malnutrition. This was noticed by the positive response by many women whereby 21 (f=42.9%) of them strongly agreeing, six (f=32.7%) agreeing, and nine (f=18.4%) disagreeing. A French study by Smith, Hurt, Chowdhury, Sinha, Fawzi and Edmond (2017:7) who found a strong biological basis for potential mechanisms to explain premature infant survival with early initiation of breastfeeding which exposes the infant to maternal colostrum, which is thought to decrease the risk of microbial translocation, accelerate intestinal maturation and promote resistance and epithelial recovery from infection.

4.6.12 Preferred Method of Infant Feeding (n=49)

The mothers were asked about the preferred method of breastfeeding while their infant is still in the ward after removal of a nasogastric tube feed. A list of various feeding methods, including breastfeeding, was made for them to choose from. According to Table 6, 27 (f=55.1%) chose to breastfeed, and this evidenced by a study done in South Africa Kwa-Zulu Natal by Swarts, Kruger and Dolman (2010:45) whereby 42 (f=58%) women chose to breastfeed as a feeding method, and 42 per cent of the women indicated that nobody influenced their decision. In this study, 13(f=26.5%) chose cup feeding, five(f=10.2%) chose bottle feeding and four (f=8.2%) opted for a syringe feeding method.

4.6.13 Breastfeeding Assistance (n=48)

The mothers were assessed about the source of breastfeeding assistance. Forty-two (f=85.7%) mentioned the ward sister as their source of information. In the South African study by Swarts, Kruger and Dolman, all women included in their study received assistance from clinic sister and other health care workers. An Australian study by Burns (2016:211) suggests health professional move towards a “go with the flow” approach, where breastfeeding mothers are supported to their own way to successful breastfeeding. Another in the United Kingdom by Bick and Chang (2016:4) supports the assistance given by health professionals to achieve breastfeeding initiation by mothers. Six (f=12.2%) got breastfeeding assistance from their own mother. An American study by Radzyminski and Calister (2016:26) reported that it is essential to educate maternal family members, especially grandmothers, as sources of information and providers of assistance to breastfeeding mothers in the African American community.

4.6.14 Support Given to the Mother of a Premature Infant (n=49)

Respondents were asked if mothers of premature infants get any support from the staff concerning the initiation of breastfeeding to their premature infants. A significant number of respondents showed a lack of support from the ward staff, as reflected in Table4.6. Forty-eight (f=98. %) responded with “No” answer and only one(f=.2%) gave a positive answer. These responses can be attributed to findings of the Australian study by Gleeson, Flowers and Fenwick (2014:222) where women reflected their perceptions that the neonatal ward was a busy and chaotic environment. Some of them commented that a midwife would arrive to answer the buzzer long after the need for assistance had arisen. Other factors were when a midwife was seen “popping” in and out, often after waiting for considerable lengths of time for the midwife to appear (Gleeson, Flowers & Fenwick 2014: 223). A South African study of Jikijela, James and Sonti (2018:15) found that mothers needed assistance and support regarding self-care and breastfeeding, and needed to be informed about hospital policies so that they know what to expect. A Swedish study by Cato, Sylven, Lindback, Skalkidou Rubertsson (2017:26) suggested that caregivers should pay attention and target women within risk groups who needed breastfeeding support most and that midwives should make a priority of information given to women in need of additional breastfeeding support. A Norwegian study by Bragelien, Rokke and Markestad (2010:1430) has reported that attitudes and knowledge of the nursery staff and subsequently education and encouragement of mothers may improve oral feeding, and particularly breastfeeding to premature infants.

4.7 ASSOCIATION OF LACK OF BREASTFEEDING KNOWLEDGE WITH MATERNAL CHARACTERISTICS

Maternal lack of breastfeeding knowledge was correlated with maternal characteristics, as indicated in Table 7. Maternal attributes with which lack of breastfeeding was related to in the study were: educational level of the mother, other children, staying with the mother, her other children that she breastfed in the past, knowledge of benefits of breastfeeding and breastfeeding support from the ward staff. Pearson’s is a correlation coefficient designating the magnitude of the relationship between two variables measured on at least an interval scale; also known as the product-moment correlation (Polit Beck 2014:387).

Table 4.7: Pearson's Chi association of lack of breastfeeding knowledge with maternal characteristics

Attributes	N	Pearson Chi	P-value
Age	49	1.253	0.990
Marital status	49	0.369	0.544
Education level	49	11.484	0.009*
Occupation	49	5.232	0.264
Other children she has	49	1.154	0.283
Number of children	36	8.229	0.084
Ages of her children.	49	1.063	0.998
Children staying with her	49	15.653	0.016*
Other children staying with her but not hers	49	0.450	0.994
Children that she breastfed	45	14.318	0.006*
Sources of breastfeeding information	49	4.537	0.209
Feelings before breastfeeding	49	0.542	0.990
Feeling after breastfeeding	49	0.766	0.858
Breastfed other children	49	1.922	0.383
Knowledge of the benefits of breastfeeding	49	49.000	0.000*
Other methods of infant feeding	49	1.758	0.780
Belief that breastfeeding is time-wasting	49	0.408	0.939
Premature baby is too small	49	2.827	0.830
Other infant feeding methods prohibited	49	7.316	0.293
Nutrition deficiency due to delayed breastfeeding	49	1.361	0.715
Preferred feeding method	49	0.832	0.842
Breastfeeding assistance	49	0.199	0.978
Breastfeeding support from ward staff	49	49.000	0.000*

4.7.1 Education Level of the Mother (n=49)

An association exists between the maternal level of education and lack of breastfeeding knowledge, as shown in Table 7. Out of the total of 49 mothers, education level (11.84, 0.009).This was true in an Iranian study by Haqhiqhi and Varzande (2016:3764) a correlation was found between the maternal level of education and knowledge of exclusive breastfeeding which indicated that despite good maternal attitude, lack of sufficient knowledge about exclusive breastfeeding could lead to early stopping of breastfeeding.

4.7.2 Other Children Staying with the Mother in the Same House (n=49)

The mothers were assessed on other children staying with her in the same household. This was done to determine the maternal burden with other children that she was responsible for. Table 7 showed that of the 49 mothers (15.653,0.016*) correlation was found between lack of breastfeeding knowledge and women in overcrowded and women from the low socioeconomic background. A Kenyan study by Mucheru (2016:226) found that women living in slums were subjected to overcrowding, poverty, poor living conditions and all these factors affected breastfeeding practices and knowledge about breastfeeding in general. Petry, in an American study (2013:27), found that women from low socioeconomic background lacked knowledge about breastfeeding and minimally or never initiate breastfeeding because of the high rate of drug and substance abuse, alcohol intake, and smoking which is believed to harm the baby through breast milk. Their Infants were fed using formula packages supplied free of charge by American Agencies (Petry 2013:34).

4.7.3 Children That She Breastfed (n=49)

A correlation between children that the mother breastfed previously and lack of knowledge of breastfeeding. Of the 45 (14.318,0.006*) in an Indian study of Kishore, Kumar and Aggarwal (2010:187) reported that rural Indian women with previous breastfeeding experience still gave pre-lacteals to their infants before initiating breastfeeding in the form of plain water, glucose water, honey and herbal tea. In another of women who also practised partial breastfeeding gave infants cows and buffalo milk, respectively.

4.7.4 Knowledge of Benefits of Breastfeeding (n=49)

These women were in the range of 49 (49.000, 0.000), which demonstrated a clear association between knowledge of breastfeeding benefits and lack of breastfeeding knowledge. An Indian study of Vijayalakshmi, Susheela and Mythili (2015:368) found that there were minimal challenges in mothers who knew the benefits of breastfeeding, predominantly mothers knew that colostrum is first breast milk and contains baby immunity, (91.8%) of mothers verbalised the importance of burping the infant after

breastfeeding. In the same study, more women started supplementary feeds at 4-6 months of age and gave reasons that breast milk was insufficient to calm down the baby.

4.7.5 Breastfeeding Support from Ward Staff (n=49)

A high correlation was demonstrated in Table 7 between breastfeeding support from ward staff and lack of breastfeeding knowledge. Out of 49 (49.000, 0.000*) women who lacked knowledge of breastfeeding received breastfeeding support from ward staff, and this was evidenced by a Swedish study by Grenholm, Soderstrom and Lindberg (2016:130) who reported a need for collaboration between maternal and child health care. The support must be individually tailored to meet parental needs; cooperation between maternal and child health care is vital to provide continuous breastfeeding support throughout the care chain. Health care professionals involved in maternal and child health care should receive guidelines and training in effective breastfeeding support and counselling (Grenholm, Soderstrom & Lindberg 2016:130).

4.8 CONCLUSION

This chapter has discussed data analysis, interpretation and findings. Findings were discussed about literature.

Factors associated with delayed initiation of premature infants were found to be related to the staff and maternal socio-demographic characteristics, maternal breastfeeding practices and the health service characteristics or factors.

Chapter 5 draws the study to the conclusion, briefly describes the study limitations and makes recommendations for clinical practice and further research.

CHAPTER 5

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter will discuss the conclusions of the study, the study limitations recommendations and areas of further research based on the findings. The study aimed to identify and describe factors, which delay the initiation of breastfeeding to premature infants before discharge from the hospital. To assess the knowledge of midwives with regards to guiding mothers in breastfeeding their premature infants. To assess the knowledge of the mothers about the initiation of breastfeeding of their premature infants and to develop guidelines to assist midwives in guiding and supporting mothers with breastfeeding premature infants. The study wished to identify these factors and describe them in isolation and relation to other factors associated with the delay in initiation of breastfeeding to premature infants.

Questionnaires were used to collect data from all staff of Sick Neonate Unit in the hospital, and other questionnaires were used to collect data from mothers of premature infants admitted in the unit, this included mothers in the kangaroo area and mothers of premature infants who brought their babies at the Paediatric Out Patient Department

5.2 SECTIONAL: SOCIODEMOGRAPHIC FACTORS OF STAFF

5.2.1 Age

Data revealed that 15 (f=30%) were 31-40 years of age and were the majority of staff and only two (f=4%) 50-60 years of age. This was cause for concern because research had shown that younger nursing staff had limited breastfeeding knowledge compared to older ones in the same environment (Bozzette, Ahmed & Bantz 2011:361).

Recommendations

It is recommended that a Sick Neonate Unit where premature infants are admitted, be staffed adequately with middle age and older nursing staff especially midwives who have

experience, knowledge and skill and patience to assist mothers initiate breastfeeding to their premature infants after removal of nasogastric tube feeding and before discharge from the hospital.

5.2.2 Gender

Data has revealed that 45 (f=90%) were females and five (f=10) were males. Gender played a part in supporting and motivating women initiate breastfeeding to their premature infants before discharge. A South African study of Swarts, Kruger and Dolman (2010:42) has shown that women are a source of valuable breastfeeding information to one another.

Another study in Saudi Arabia by Amin (2014:12) reported that midwives and staff who breastfed their babies could efficiently assist premature mothers to initiate breastfeeding.

5.2.3 Designation

The study findings showed that designation of nursing staff is associated with delay of initiation of breastfeeding to premature infants, because the time and interest of staff members to guiding and assisting mothers of premature infants with breastfeeding 21(f= 42%) were D4: four Midwifery students allocated in the ward; 12 (f=24%) were Enrolled in Nursing Auxiliaries; nine (f =18%) were Registered Nurses with a qualification in Midwifery; six (f=12) were Enrolled Nurses and one (f= 2.0%). A Saudi Arabian study done by Amin (2014:17) found that more qualified staff and students in their advanced years of training and education had a higher positive and better insight towards breastfeeding. An American study by Vanderwark (2014:28) also confirms the above whereby further training and education of students showed higher knowledge of breastfeeding.

Recommendations

It is recommended to allocate about 10 qualified midwives in the Sick Neonate Unit(SNU), and more Diploma in Nursing (General, Psychiatric and Community) and Midwifery students in their final year of training, because evidence has shown that more qualified staff and students in their advanced years of training and education are more positive in

assisting and guiding mothers with initiation of breastfeeding to their premature infants (Amin 2014:107; Vandewark 2014:28).

5.2.4 Years of Work Experience

The study findings have demonstrated that 36 (f=72%); 6-10 years of experience, nine (f= 18%); 11-15 years of experience, two (f=4.0%); 21-30 years, two (f=4.0%) and 0-1 only one (f=2.0%) - see Table 1. Years of experience in the (SNU) play an important role in as far as assisting and guiding mothers of premature infants. Staff members with more experience in the ward are more likely to have a better knowledge of breastfeeding in general and are patient and confident in assisting mothers to initiate breastfeeding than those with less experience (Vanderwark 2014:13).

Recommendations

It is recommended that hospital management should consider the allocation of staff members who have more experience in the care of premature infants and more especially in ensuring that premature infants are given their mother's breast milk while in the ward. Vandewark (2014:13) reported increased knowledge with progression in nursing studies and senior staff members reported to be more knowledgeable in breastfeeding than new staff in the ward.

5.3 SOCIODEMOGRAPHIC CHARACTERISTICS OF MOTHERS

Socio-demographic characteristics of premature mothers covered age, marital status, education level, employment status and ages of their children - see Table 2.

5.3.1 Age Groups

Research has evidenced the age factor in the mother of a premature infant as the data reflected more women 23 (f=46.9%) were aged 23-27. This is accepted because this age group falls within the normal childbearing age. Only three (f=6.1%) 33-37 years and fell in advanced maternal age, and this category of women are more likely to initiate and sustain breastfeeding of their infants.

Recommendations

Staff working in the SNU should be aware and immediately identify young mothers who have delivered premature infants because those mothers are the ones who require more attention, consideration, care and more time to be given to assist them with the initiation of breastfeeding to their infants. A study done in Japan by Kitano, Nomura, Murakami, Ohkubo, Ueno and Sugimoto (2016:122-123) has found that maternal age is significantly associated with the initiation of breastfeeding because young mothers are at an increased risk of early breastfeeding cessation and less likely to breastfeed their babies because of alcohol and drug abuse.

5.3.2 Marital Status

The maternal marital status influences the initiation of breastfeeding to their infant. The findings revealed that 36 (f=73.5%) were single, and 13 (f=26.5) were married. The most critical factor in maternal marital status is that married mothers get more support from their spouses about breastfeeding than single ones.

Recommendations

It is strongly recommended that married couples be encouraged to attend antenatal care and classes where information about breastfeeding is discussed. The staff of SNU should be aware of single mothers who do not have adequate support for breastfeeding, and more time should be spent with them concerning breastfeeding. A study of Gibson- Davis and Brooks-Gunn (2010: 514) reported an association of couple's relationship status and quality with breastfeeding initiation because married mothers were more likely to breastfeed with the support of the partner than unmarried mothers were.

5.3.3 Education Level

Maternal education has been shown in the study findings that it plays a significant role in the initiation of breastfeeding. The data has found that more mothers 34 (f=69.4%); had an education from Grade 8-12, 11 (f=22.4%) had tertiary education, and four (f=8.2%) were in the Grades of 1-7.

Maternal education level depends on their socio-economic background because highly educated women empower themselves with more information about breastfeeding, and it becomes easy for them to access a variety of information unlike those less educated and undereducated.

Recommendations

It is recommended that education about breastfeeding should be started pre-conceptually and secondary and high school education programmes must include antenatal care and breastfeeding information to all girls. School Health Nurses should also target young girls at secondary schools and provide them with antenatal care and breastfeeding education. A study of Shahla, Fahy and Kable (2010:3) have demonstrated uneducated and undereducated women lack knowledge of breastfeeding and only rely on their mothers, grandmothers and friends as a source of breastfeeding information. The study findings are valid because fewer mothers had tertiary education, and some of them might not have a mother and/or a grandmother for breastfeeding information.

5.3.4 Employment Status

Findings of this study demonstrated that that more mothers were unemployed three(f=69.4%); eight(f=16.3%) were employed; five(f=10.2%) scholars; one(f=2%) was a professional and one(f=2%) was missing. Maternal employment plays a part in breastfeeding initiation because some women who are very motivated to breastfeed their infants might stop breastfeeding once they return to work. In most instances, this is because mothers do not have time to breastfeed while at work, or the work environment is not breastfeeding friendly. An American study by Kim, Fiose and Donovan (2017:159) found that employment can be a barrier against breastfeeding. A few barriers were identified: returning to school or work, the stigma against breastfeeding in public, finding time to breastfeed and breastfeeding perceived as expensive because the woman must eat a healthy diet and in other workplaces breastfeeding is not a culturally accepted behaviour (Kim, Fiose & Donovan 2017:161).

Recommendations

It is recommended to have working mothers and scholars initiate breastfeeding before returning to school or work and be given information about the benefits of exclusive breastfeeding for at least 6 months, and if possible all breastfeeding women be taught about expressed breast milk and ways to store their milk whilst at work or school so that they continue breastfeeding their infants after school and work. Advertisements of other means of infant feeding other than breastfeeding should be discouraged from schools and workplaces this practice can be done in collaboration with midwives, School Health Nurses and Occupational Health Nurses.

5.3.5 Ages of Their Other Children

The data in Table 2 showed that ages of mother's children played a part in the mother's initiation of breastfeeding to her premature infant because mothers who had older children showed less association with factors that delay breastfeeding, whereas mothers with younger children were more likely to delay initiation of breastfeeding. More mothers, seven (f= 14.3%), had children between the ages of 1-5; another seven (f=14.3%) had children between the ages of 6-10; three (f= 6.1%) had children in the range of 1-18; three (f= 14.3%) between 11-18 years; one (f=2%) 1=10 and 2 (f=4.1%) 11-25 years., one (f=2%) 1-10, one (f=2%) 6-18 and one(f=2%) 1-25.

Recommendations

The findings of the study reveal that many women, which leads them burdened by many children and cannot spend enough time breastfeeding their young children, do still not practice birth spacing and family planning. Information about birth spacing should start at home at a very young age of a girl child, be continued at primary, secondary school and tertiary level and throughout their lifespan.

5.4 SECTION B: HEALTH SERVICE FACTORS

These factors were more about the staff perceptions regarding breastfeeding practices for the premature infants, and the following were assessed: staff views about breastfeeding a premature infant, staff current feelings about breastfeeding a premature infant before discharged, the importance of starting breastfeeding before an infant is discharged, other methods of premature infant feeding, using other convenient methods of feeding, mother support about breastfeeding, giving breastfeeding and other methods of infant feeding, staff views about delaying breastfeeding. All the above health services factors are shown in Table 3.

5.4.1 Staff Views About Breastfeeding a Premature Infant

The views of staff towards breastfeeding to premature infants who had a nasogastric tube removed showed 27 (f=54.0%) staff members had a positive view of breastfeeding.

These findings are supported by a study done by Gleeson, Flowers and Fernick (2014:219) which emphasised the midwife's attitude being an essential factor in promoting breastfeeding. Eleven (f=22.0%) were neutral, seven (f=14.0%) three (f=6.0%) showed missing information, and two(f=4.0%) did not know. As evidenced by a study done by Entwistle, Kendall and Mead (2009:3) where midwives' lack of adequate knowledge about breastfeeding and their negative attitude towards breastfeeding was a contributory factor. In their study, midwives felt unprepared to support women to breastfeeding.

Recommendations

The data in the study showed that more midwives had a positive view of breastfeeding. Those midwives, who appeared to be neutral about breastfeeding, could have their attitudes changed by empowering them more with breastfeeding knowledge so that they can motivate women to breastfeed. Nursing Education Programmes need to ensure that they are designed to equip health care professionals with the skills necessary to empower women to breastfeed successfully, interactive workshops, seminars, conferences can result in substantial changes in professional practice (Entwistle, Kendall & Mead 2009:3).

According to these researchers, the Ten Steps to breastfeeding do not address the needs of specific social groups and therefore recommended an amendment to be considered to the Ten Steps.

5.4.2 The Staff Were Asked About Importance of Initiating Breastfeeding Before the Infant Is Discharged

Of the 50 staff members, twenty-two (f=44.0%) verbalised that they agree that breastfeeding should be initiated before the infant is discharged, 15(f=30.0%) reported to strongly agree. This was supported by a study done by Yang et al. (2018:2) who found that health professionals including nursing students, do not always receive adequate breastfeeding education during their foundation education programme to effectively help mothers.

Recommendations

It is recommended that the Midwifery training curriculum include programmes, which equip student nurses studying Midwifery with breastfeeding education to enable them to teach all mothers of newborn and particularly premature infants. These programmes should have practical sessions whereby students are exposed to guiding and assisting mothers initiate breastfeeding to their premature infants, and assessment strategies could be put in place to ensure mastery of the skills by students.

5.4.3 The Staff Were Asked About Other Convenient Methods of Infant Feeding

The data demonstrated that eighteen (f=36.0%) members of staff disagreed with the other convenient methods, sixteen (f=32.0%) agreed, seven (f=14.0%) strongly disagreed to methods and six (f=12.0%) strongly agreed. The above data showed that staff members were against other feeding infant feeding methods. A study of Guevara (2017:65) in North Carolina USA emphasised that evidence showed that educating healthcare professionals who have contacts with breastfeeding and lactating women can positively enhance breastfeeding initiation and duration. The percentage of staff who agreed to other feeding methods, did so due to their own knowledge deficit and lack of confidence in guiding mothers and teach them the technique of breastfeeding.

Recommendation

Continuing education and training of staff of SNU is of paramount importance in enhancing the initiation of breastfeeding support and knowledge to mothers. A study of Dodgson (2014:122) in the USA found significantly more positive breastfeeding attitudes and beliefs in graduate students.

5.4.4 The Staff Asked About Importance of Mother Support with Breastfeeding

Of the 50 staff members, twenty-two (f=44.0%) agreed to mother support by staff, eighteen (f=36.0%) strongly agreed to the statement, and only seven(f=14.0%) disagreed with one(f=2.0%) strongly disagreeing and two(f=4.0%) missing information. An Australian study of Gleeson, Flowers and Fernick (2014:212) found that postnatal women spoke very positively of midwives who spent time with them and helped them figure out what they needed to do, midwives created a sense of time and space, focused on the woman and her breastfeeding experience made women felt best assisted. These women also verbalised that it was the emotional support, assistance and advice if made their view of time spent so positive.

Recommendations

It is recommended that hospital policies, protocols and these should be designed in such a way that midwives and other health professionals in the SNU have allocated time to spend helping women with breastfeeding and this should be in all shifts. This period spent with mothers should also be a task delegated to a midwife or any other health professional working with premature infants and should appear in the delegation book for record purposes.

5.4.5 Staff Views That Delayed Breastfeeding Leads to Nutrition Deficiency

The response was twenty-two (f=22.0%) agreed, and this was evidenced in the study of micronutrient deficiencies among breastfeeding infants in Tanzania. To achieve the new Sustainable Developmental Goals (SDGs), a significant reduction in under-five mortality and neonatal mortality must be achieved.

South Africa falls within the Sub Saharan region where neonatal and infant mortality still accounts for more child deaths. Fifteen(f=30.0%) disagreed, seven(f=14.0%) strongly agreed and six(f=12.0%) strongly disagreed with one(f=2.0%) missing information. A big percentage of staff was aware of nutrient deficiency caused by delayed initiation of breastfeeding in a premature infant. A Tanzanian study done by Bellows et al. (2017:4) found that infant mortality accounted for the majority of child deaths in Tanzania, and malnutrition was an important underlying cause.

Recommendations

It is recommended that the nutrition deficiency caused by delayed initiation of breastfeeding should be emphasised to all women in their childbearing age as an important part of breastfeeding education, and could be part of the high school curriculum in secondary schools and tertiary education to those in the health studies of various institutions. Sustainable Developmental Goal 3 is about ensuring healthy lives and promote well-being for all at all ages. In a nutshell, this SDG focuses on reducing child and maternal deaths, improving the health for all people worldwide, especially the prevention of the under-five mortality. An Indian study of Katsinde and Srinivas (2016: 146) confirmed that breastfeeding babies are protected from the recurred occurrence of diarrhoea; dehydration and addition of complementary foods to an infant's breastfeeding are major contributors to infant and young child mortality globally.

5.4.6 The Staff and the Appropriate Gestation Age to Initiate Breastfeeding in A Premature Infant

Of the staff members, 32(64.0%), indicated that the appropriate gestation age to initiate breastfeeding on a premature infant is 34-37 weeks, and 36(72%) agreed that the infant is swallowing reflex is ready at that same gestation age. Of 50, 11(22%) of the staff recommends the premature infant initiate breastfeeding at 30-32 weeks of gestation, and 12(24%) of them supports the fact that swallowing reflex is functional at that age of a premature infant. Six (12%) of women agreed that the baby could be breastfed at 26-29 weeks of gestation, and only 2(4%) supports the readiness of the infant's reflex. Finally, only one (2%) staff member fell under missing information.

According to the Danish study by Maastrup et al. (2014:22), premature infants as young as 24-27 gestation were breastfeeding exclusively. This study also compared infant's exclusive breastfeeding, partial breastfeeding and not breastfeeding at all.

Recommendations

It is recommended that all staff allocated in SNU should know about a premature physiological development including the infant's gestation age at birth and underdeveloped reflexes, failing of which the charge nurse or midwife must make certain that all staff are given this information through continued professional development sessions. The importance of this is to make all staff aware that as early as below 30 weeks of gestation, breastfeeding can be initiated to these infants and all other feeding methods should not be tried. A Danish study by Maastrup et al. (2014:22) revealed that, if the mother wants to establish exclusive breastfeeding to her infant, bottle-feeding and other methods should never be introduced in the NICU.

5.4.7 Number of Times the Mothers Were Assisted with Breastfeeding

The study findings showed that less time was spent with mothers by the staff of SNU. Eighteen (f=36%) of the staff assisted mothers with breastfeeding five to seven times in two weeks, which was the maximum period spent with the woman and 14(f=28%) of them never assisted mothers with breastfeeding. This practice was reported in an Australian study done by Schmied, Beake, Sheehan, McCourt and Dykes (2011:56) which indicated that the midwife's work environment was to blame rather than the midwives themselves, women reported that midwives "looked busy" and commonly stated that they were indeed busy and understaffed. This concept has resulted in midwives consistently raised concerns about time pressures in postneonatal wards leading to mothers reported feeling guilty and reluctant to ask for help. Student midwives and other lower categories of the staff do not see spending time with the women being a priority because many experienced and highly qualified midwives give excuses of staff shortage that prevents them from spending time with mothers.

Recommendations

The same recommendations suggested in giving support to mothers should apply in spending time with a mother who requires guidance, information and skills about breastfeeding. Staff members should be delegated time to spend with mothers and the practice be recorded. Spending time with mothers should be taken seriously in all premature units.

5.4.8 Challenges of Health Service

Of a total of eight challenges, three (f=38.0) were those who stated that breastfeeding should be started after the removal of nasogastric tube feeding, and the baby should not be tried on any other feeding method. Amongst the factors listed were: Breastfeeding after removal of the nasogastric tube, Bond between mother and infant, time-consuming and mother very enthusiastic. A British study by O'Brien, Myles and Prichard (2017:224) found that the baby becomes confused when breastfeeding is continued with bottle-feeding at the same time. Two (f=25.0%) observed the bond between mother and baby strengthening. Two (f=25.0%) reported that it was time-consuming to help the mother put her baby on breastfeeding for the first time and one (f=13.0%) verbalised that the mother was very enthusiastic about feeding on demand every time the baby wanted to.

Recommendations

It is recommended that breastfeeding is started immediately after removal of a nasogastric tube feeding, because it strengthens the bond between mother and infant, and no other feeding method should be tried to prevent confusing the baby. Time-consuming must never be taken as a factor to delay initiation breastfeeding on a premature infant while in the ward.

5.4.8.1 Staff reasons for not initiating breastfeeding

The following were indicated as reasons for not initiating breastfeeding: An infant admitted in High Care/Intensive Care Unit with Medical condition, admitted in High Care/Intensive Care Unit with Other Conditions, some women mentioned lack of transport and money to

come to the hospital, and some women mentioned all the above reasons. Table 5 shows that an increased number of staff, five (f=38%) cited infant's admission to High Care, or Neonatal Intensive Care Unit (NICU) with a medical condition being the main reason not initiating breastfeeding. A study of O'Brien, Myles and Prichard (2017:222) supports the statement by mentioning barriers to breastfeeding due to a sick baby with Necrotizing Enter colitis when a baby will be admitted in NICU. Three (f=23%) mentioned an infant admitted in NICU or High Care for a more extended period with other conditions. Three(f=23%) talked about mothers who are not able to visit their premature infants frequently in the hospital due to lack of transport and money, and one (f=15.3%) mentioned all of the above reasons as barriers to breastfeeding initiation.

Recommendations

It is recommended that when an infant is admitted in High Care or Neonatal Intensive Care Unit with or without a medical condition, the mother should frequently visit the unit to express breast milk to be given to her sick infant via a nasogastric tube. This will enable the mother time to initiate breastfeeding on her infant as soon as oral feeding is started. Gauteng District hospitals have sleeping facilities for mothers whose babies are admitted for a more extended period in High Care, or Neonatal Intensive Care Unit, especially those mothers who reported lack of money and transport. Mothers who can afford to reach the hospital should be encouraged to visit daily, and some hospitals provide day facilities for mothers, and these should be utilised fully by the staff.

5.5 SECTION C: MATERNAL BREASTFEEDING FACTORS/PRACTICES

Mothers were assessed for maternal breastfeeding practices or factors relating to breastfeeding knowledge, childbirth order in terms of breastfeeding, sources of breastfeeding information, their feelings about breastfeeding before breastfeeding their own baby, feelings about breastfeeding afterwards, breastfeeding other children, benefits of breastfeeding, other methods of breastfeeding, breastfeeding seen as time-wasting, other prohibiting reasons, delayed breastfeeding, preferred method of infant feeding, breastfeeding assistance and support given to the mother.

5.5.1 Sources of Breastfeeding Information, Assistance and Support Given to Them

Women verbalised getting information about breastfeeding from a variety of sources. Thirty-three (f=67.3%) obtained information from clinic sister, nine (f=18.4%) got information from their own mother, six (f=12.2%) from all other sources and one (f=2.0%) was missing information. A study by Radzyminski and Callister (2016:25) indicated that women get breastfeeding information from a variety of sources including their own mother, friends, magazines, newspapers, television and other sources. Forty-two (f=85.7%) mentioned the ward sister as their source of information, six (f=12.2%) received breastfeeding assistance from their own mother with one(f=2.0%) presenting missing information. An American study by Radzyminski and Calister (2016:26) reported that it is essential to educate maternal family members, especially grandmothers as sources of information and providers of assistance to breastfeeding mothers in the African American community. A significant number of respondents showed lack of support from the ward staff as reflected in Table 6 42(f=85.7%) responded with “No” answer, and only six (f=12.2%) gave a positive answer with one (f=2.0%) presenting missing information. These responses can be attributed to findings of a South African study by Jikijela, James and Sonti (2018:15) who found that mothers needed assistance and support regarding self-care and breastfeeding and needed to be informed about hospital policies so that they know what to expect.

Recommendations

It is recommended that the staff of SNU and midwives are responsible in empowering mothers with breastfeeding information because in most cases their mothers and grandmothers might give them information based on their cultural beliefs and practices, which will be detrimental to early initiation of breastfeeding. Support and assistance could not be overemphasised that every staff member should be available for support and assistance if not sure, referral to senior staff members is mandatory. Promotion and support of breastfeeding is an essential role of every midwife and other health professionals working in SNU.

It is also recommended that the staff should assist mothers to identify breastfeeding challenges in a positive way, mother confidence should be encouraged, respect and acknowledgement of the positive maternal experience of breastfeeding. Mothers can be referred to community breastfeeding support groups if available. Mothers must be provided with realistic goals to breastfeeding and review them daily; praise is provided when due.

5.5.2 Breastfeeding Other Children

This involved breastfeeding some or all of their children. The mothers were instructed to respond with a Yes or No. Seventeen (f=34.7%) responded positively, and another 17 (f=34.7%) responded negatively with 15 (f=30.6%) presenting missing information. Some of the reasons for not breastfeeding were: mother's milk was like water; milk was not coming out, blood oozing from the nipple. A study done in Sudan by Brockway, Benzies, Carr and Aziz (2018:13) reported that due to maternal negative cultural beliefs, colostrum was discarded because mothers thought it was dirty and bad.

Recommendations

Mothers who have previously breastfeed other children are found to reflect on that previous experience and utilise it for their current practice. It is essential to obtain this type of information from the mother so that it is used to correct existing misconceptions and wrong cultural beliefs and practices. It must not be taken for granted that a mother is not breastfeeding for the first time, so she knows. Midwives need to dig more from mothers about other babies they had breastfed in the past.

5.5.3 Other Methods of Infant Feeding and Preferred Ones

Eighteen (f=36.2%) women had used bottle-feeding in the past followed by 11 (22.4%) who had used a cup to feed their infants, five (f=10.2%) used a syringe and three (f=6.1%) women who mentioned they did not use any of the above methods with 12 (f=24.5%) presenting missing information. A Brazilian study by Cricco-Lizza (2016:97) found that women preferred formula feeding to breastfeeding, because the latter evoked fewer emotions and most health care workers viewed it as safe and convenient.

According to Table 6, as a preferred method of infant feeding, 27 (f=55.1%) chose breastfeeding, and this is evidenced by a study done in South Africa Kwa-Zulu Natal by Swarts, Kruger and Dolman (2010:45) whereby 42 (f=58%) women chose to breastfeed as a feeding method, and 42 per cent of the women indicated that nobody influenced their decisions . In this study, 13 (f=26.5%) chose cup feeding, five(f=10.2%) chose bottle feeding and four (f=8.2%) opted for a syringe feeding method.

Recommendations

Research findings have shown that many women still used a bottle with formula feed, some used a cup, a syringe and those women in the study who did not mentioned any of the listed methods because they were not sure of the correct method to use, or did not want to mention that they did not breastfeed at all which might be due to the fact that this group of women lacked knowledge of breastfeeding and its benefits. Breastfeeding was still a preferred method of feeding by many. Breastfeeding information should be given to all women in spite of their parity and previous infant feeding methods. It is recommended to spend time with individual mothers in addressing the above factors.

5.5.4 Delayed Breastfeeding and Nutrition Deficiency

The study findings showed that 21(f=42.9%) of mothers strongly agreeing, six(f=32.7%) agreeing, and nine(f=18.4%) disagreeing and three(f=6.1%) presented missing information. A French study by Smith, Hurt, Chowdhury, Sinha, Fawzi and Edmond (2017:7) found a strong biological basis for potential mechanisms to explain premature infant survival with early initiation of breastfeeding which exposes the infant to maternal colostrum, which is thought to decrease the risk of microbial translocation, accelerate intestinal maturation and promote resistance and epithelial recovery from infection. The percentage of women who disagreed demonstrated a knowledge deficit, and this is an area to be addressed in breastfeeding education.

Recommendations

Like all other important aspects of health education about breastfeeding, knowledge about nutritional deficiency could be taken seriously by midwives.

It is recommended that mother's knowledge of nutritional deficiency to their infants be assessed to all mothers in the unit using questionnaires, and more information is given based on what the mother already knows about this factor. SNU should have attractive pictures on the wall of infants who suffered nutrition deficiency due to late initiation of breastfeeding. A record of such assessment should be kept by the unit. It should be mandatory for all midwives to be taught how to teach mother about the technique of breastfeeding and to give them valuable information.

5.6 RECOMMENDATIONS FOR FURTHER RESEARCH

Based on the study findings, the researcher recommends that further research could be undertaken in the following areas:

- Factors which delay initiation of breastfeeding to premature infants who were born with respiratory problems because this is common in many instances.
- Assessment of the neonatal outcomes to those infants who initiated breastfeeding and other feeding methods immediately after the removal of a nasogastric tube.
- An assessment of the midwives' knowledge of factors that prohibit the early initiation of breastfeeding to all premature infants in a unit.
- An in-depth study is necessary on cultural beliefs and socioeconomic determinants with regard to discarding of colostrum and rendering it bad and harmful to the infant, although this practice is not found in the South African communities, but South Africa has recently become a multinational and multicultural society because of so many other nationalities residing here.
- Identification of factors that lead to young and unmarried mothers not ready to initiate breastfeeding, and if they do, failure to sustain exclusive breastfeeding at least for six months.

5.7 STUDY LIMITATIONS

The study was limited to only one public and a district hospital in the Gauteng Province; hence, its findings cannot be generalised to other district hospitals in the whole province. The main intention was to identify evidence-based factors which delay the early initiation of breastfeeding to premature infants after removal of a nasogastric tube.

Data were collected at various periods from the Sick Neonate Unit, from the Kangaroo Mother Care and Paediatric Outpatient Department and that in prolonged the data collection process. The study also tried to identify factors delaying premature breastfeeding in general, but did not consider initiation strictly one hour after birth and duration of delay of initiation after a nasogastric tube is removed. The researcher added a question on breastfeeding other children by the premature mother, which revealed profound and important information based on the women's beliefs about colostrum, which should never be left out in any assessment of factors, which delay early initiation of breastfeeding, or any investigation pertaining to breastfeeding practice in general.

5.8 CONCLUDING REMARKS

Delaying the initiation of breastfeeding is still a global challenge, and this is evidenced by an increased in mortality rates of the under five years and young children. Hospital policies, protocols, and governmental guidelines are still challenging, which cannot be changed overnight, and that delays changes in breastfeeding practices that could be implemented to improve and prolong the lives of children.

Empowering midwives with more knowledge to be able to teach women of premature mothers about breastfeeding on a larger scale cannot be ignored. Commonly, everybody, including mothers who are under the care of health professionals and midwives believes that mothers are provided with the support and assistance they require, yet practically that is not the case. According to the study, delayed initiation of breastfeeding to infants is a multifactorial challenge, which also requires a multidisciplinary health team approach to address and tackle.

The study findings recommend a continuous assessment on health professional's knowledge of breastfeeding, benefits of breastfeeding and the type of support and assistance to be given to all mothers of premature infants irrespective of their sociodemographic background, education level and health service factors which hinder breastfeeding practices in health institutions.

Other findings, which were outstanding in this study, are that in the assessment of maternal breastfeeding knowledge should never be done in isolation, but of importance is considering the maternal source of breastfeeding information and their cultural beliefs and practices around that aspect of infant feeding.

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ANNEXURES

ANNEXURE A

ETHICAL CLEARANCE CERTIFICATE, DEPARTMENT OF HEALTH STUDIES, UNISA

UNISA university of south africa

UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

REC-012714-039

HSHDC/398/2015

Date:	26 February 2015	Student No:	5376-141-6
Project Title:	Factors associated with the delay in the initiation of breastfeeding to premature infants before discharge from hospital.		
Researcher:	Sibanyoni Edna Jeanette		
Degree:	MA in Nursing Science	Code:	MPCH594
Supervisor:	Prof LM Modiba		
Qualification:	D Cur		
Joint Supervisor:	-		

DECISION OF COMMITTEE

Approved [√] **Conditionally Approved** [ ]

Prof L Roets
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

Prof MM Moleki
ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES

ANNEXURE B

LETTER TO THE DEPARTMENT OF HEALTH FOR PERMISSION TO DO RESEARCH AT THE FAR EAST RAND HOSPITAL

Herbert Baker Street

Sharon Park 1496

Telephone: (H) 0113642710

(W) 012 3195782 (C) 0825535167

Email: jeans24s@yahoo.com

16th November 2014

Ekurhuleni Research Ethics Committee

Dr G Motlatla

Dear Sir

Request for permission to conduct research for MA Studies in 2015

Name of student: Sibanyoni E.J.

Supervisor: Professor LM Modiba

The institution of study: UNISA

I hereby request permission to conduct research at the far East Rand hospital Sick Neonate unit as part of my MA Studies with UNISA.

The study is aiming at investigating reasons for the late initiation of breastfeeding to premature infants after removal of nasogastric tube feeding, and will, therefore, promote the early initiation of breastfeeding to these babies before discharged from the hospital. Questionnaires will be provided for data collection from mothers of premature infants registered nurses and midwives working with premature infants in the neonatal unit. Confidentiality and anonymity of subjects will be maintained, and information about the study will be given to them before signing the consent form.

Subjects will be informed that their involvement in the study is voluntary and no personal identification will be necessary throughout data collection

I would appreciate a reply to this letter be attached to my email

Thanking you in anticipation

Yours sincerely

Sibanyoni E.J.

ANNEXURE C

A LETTER TO THE HOSPITAL CHIEF EXECUTIVE OFFICER FAR EAST RAND HOSPITAL

Herbert Baker Street
Sharon Park 1496
Telephone: (H) 0113642710
(W) 012 3195782 (C)0825535167
Email: jeans24s@yahoo.com

16 May 2015

The Chief Executive Officer
Far East Rand Hospital
Private Bag X 50
Springs 1560

Dear Sir

Application for permission to collect data at the Far East Rand Hospital

I hereby request permission to collect data at the above-named hospital for my UNISA studies for the Master's Degree in Nursing Sciences. Data collection will start in May 2015 and will continue depending on the availability of the respondents for the study. I have already obtained permission from Ekurhuleni Research Ethics Committee

The study topic is Factors associated with the delay in initiation of breastfeeding to premature infants before discharge from the hospital. Data will be collected in the following areas: The Sick Neonate Unit or High Care Unit, where premature infants are admitted post-delivery. Data will be collected from staff and mothers of premature infants.

Pediatric OPD will be visited for infants who were discharged and come back for review as well as the Kangaroo Mother Care area

Thank you

Sincerely

Sibanyoni E.J.

Student number: 05376416

Cc: Nursing Service Manager

ANNEXURE D

AN APPROVAL CERTIFICATE FROM EKURHULENI RESEARCH COMMITTEE

Ekurhuleni
METROPOLITAN MUNICIPALITY

GAUTENG PROVINCIAL GOVERNMENT

EKURHULENI RESEARCH CLEARANCE CERTIFICATE

Research Project Title: Early initiation of breast feeding to premature infants before discharged from hospital.

Research Project Number: 20/02/2015-6

Name of Researcher(s): Ms. P.J Sibanyoni

Division/Institution/Company: UNISA

DECISION TAKEN BY THE EKURHULENI HEALTH DISTRICT RESEARCH COMMITTEE (EHDRC)

- *THIS DOCUMENT CERTIFIES THAT THE ABOVE RESEARCH PROJECT HAS BEEN FULLY APPROVED BY THE EHDRC. THE RESEARCHER(S) MAY THEREFORE COMMENCE WITH THE INTENDED RESEARCH PROJECT.*
- *NOTE THAT THE RESEARCHER WILL BE EXPECTED TO PRESENT THE RESEARCH FINDINGS OF THE PROPOSED RESEARCH PROJECT AT THE ANNUAL EKURHULENI RESEARCH CONFERENCE.*
- *THE RESEARCH COMMITTEE WISHES THE RESEARCHER(S) THE BEST OF SUCCESS.*

DR. J. SEPHYA

DEPUTY CHAIRPERSON: EKURHULENI METROPOLITAN MUNICIPALITY

Dated: 25/02/2015

DR. R. Kellerman

CHAIRPERSON: GAUTENG DEPARTMENT OF HEALTH (EKURHULENI REGION)

Dated: 25/02/2015

ANNEXURE E

CONSENT FORM FOR ALL STAFF OF THE SICK NEONATE UNIT IN THE HOSPITAL

Early initiation of breastfeeding to premature infants before discharge from hospital
Researcher: Ms Sibanyoni EJ
Degree: MA Nursing Science UNISA

Consent form for the professional staff of the Sick Neonatal Unit at Far East Rand Hospital

I understand that I am being asked to participate in the research study at the Far East Rand hospital sick neonate unit. This research study will investigate the reasons behind the late initiation of breastfeeding to premature infants after they were fed on a nasogastric tube. If I agree to participate in the study, I will be provided with a questionnaire to complete about my experience as a mother of a premature infant who started breastfeeding before discharge. No identifying information will be included in the questionnaire. I realise that I may not participate in the study if my experience with premature infants is not adequate. I realize that the knowledge gained from this study may help other mothers of premature infants in the future and me.

I realise that my participation in this study is entirely voluntary, and I may withdraw from the study at any time I wish. If I decide to discontinue my participation in this study, I will continue to be treated in the usual and customary manner. I understand that all data will be kept confidential, my identity will not be revealed, during the study, and the information may be used in midwifery presentations, and I should have an ability to understand English to complete the questionnaire

I understand that if I sustain injuries during my participation in the study, I will not be automatically be compensated by the hospital. All study data will be collected by Ms Sibanyoni, will be stored in a secure place, and will not be shared with any other person without my permission

I have read this consent form and voluntarily consent to participate in this study. I understand that I will be given a copy of this signed consent form.
Signature of the subject: Date :
Signature of witness: Date :
Signature of investigator: Date :

ANNEXURE F

A DATA COLLECTION INSTRUMENT FOR STAFF IN THE SICK NEONATE UNIT

QUESTIONNAIRE FOR THE STAFF MEMBERS IN THE NEONATE UNIT

Section 1

Demographic data

1. Age

22 – 25	
26 – 30	
31 – 40	
41 – 50	
50 yrs. & above	

2. Sex

Male	
Female	

3. Marital status

Married	
Divorced	
Widowed	
Unmarried	

4. Designation

Registered nurse and midwife	
Registered nurse (Community service)	
Advanced midwifery student	
B. Cur Midwifery student	
D4 Midwifery student	

One Year Diploma in Midwifery	
Enrolled nurse	
Enrolled auxiliary nurse	

5. Number of years working in neonate unit

1 – 5	
6 – 10	
11 – 15	
16 – 15	
21yrs. & above	

Section 2

1. How long have you cared for premature infants who had a nasogastric tube removed? Write the correct number in the appropriate block

2. What was your view towards initiation of breastfeeding to premature infants who had a nasogastric tube removed?

Negative	
Positive	
Does not know	
Neutral	

3. How do you feel about it now?

Changed	
The same	
Uncertain	
Neutral	

Please explain

4. Premature infants should start breastfeeding immediately after removal of the nasogastric tube and before discharge from hospital

Strongly agree	
Agree	
Not certain	
Disagree	
Strongly disagree	

5. Some of the health professionals still believe that a premature infant should be fed with other methods other than breastfeeding because at 30-34 weeks of gestation, the sucking and swallowing reflexes are underdeveloped

Strongly agree	
Agree	
Not certain	
Disagree	
Strongly disagree	

6. Other infant feeding methods are more convenient for the staff of neonate unit because they are not time-wasting

Strongly agree	
Agree	
Not certain	
Disagree	
Strongly disagree	

6. Breastfeeding can be initiated early only to multipara women because they already know the breastfeeding technique

Strongly agree	
Agree	
Not certain	

Disagree	
Strongly disagree	

7. Do you think the mothers of premature infants who were on a nasogastric tube feed receive any support from the staff of neonate unit with regard to initiation of breastfeeding?

8. Delayed initiation of breastfeeding to premature infants leads to nutritional deficiency

Strongly agree	
Agree	
Not certain	
Disagree	
Strongly disagree	

9. What do you think is the appropriate gestation age to initiate breastfeeding on a premature infant?

6-29	
30-33	
34-37	

10. The sucking and swallowing reflexes of a premature infant are well developed at:

26-29	
30-33	
34-37	

11. How many times have you helped mothers of premature infants with breastfeeding in the last two weeks?

Please tick one response

Never		Once		2-3 times		4-5 times		times and more	

12. Describe an incident where you initiated breastfeeding to a premature infant of a primigravid mother

_____
_____
_____
_____
_____

Which of the following challenges did you face and were able to deal with successfully when you initiated breastfeeding to a premature infant after removal of nasogastric tube?

Please tick as many as applicable

	It was time-consuming to help the mother put her baby on breastfeeding for the first time
	I observed the bond between the mother and her infant strengthening
	The mother was very enthusiastic to feed her baby frequently every time the baby wanted to
	Breastfeeding should be started soon after removing the nasogastric tube; the baby should not be tried on any other feeding method
	The mother did not look happy after the first attempt of breastfeeding, because she thought her baby was still hungry
	All of the above

13. Which of the following are the most common reasons for not initiating breastfeeding to premature infants by the staff of neonate unit?
    Please tick as many as possible

	Infants whose mothers are admitted in high care, or ICU due to medical conditions
	Premature Infants who are admitted in high care or ICU for a longer period because of other conditions
	Mothers who are not able to visit their premature babies frequently in the hospital due to lack of transport and money

	The Sick Neonate Unit is full all the time, and there is no space to sit with the mother and spend time teaching her to latch her baby to the breast for the first time
	All of the above

Thank you for completing the questionnaire

ANNEXURE G

CONSENT FORM FOR MOTHERS OF PREMATURE INFANTS IN THE SICK NEONATE UNIT AT THE HOSPITAL

Early initiation of breastfeeding to premature infants before discharge from hospital
Researcher: Ms Sibanyoni EJ
Degree: MA Nursing Science UNISA

Consent form for mothers of premature infants in the Sick Neonatal Unit at Far East Rand Hospital

I understand that I am being asked to participate in the research study at the Far East Rand hospital sick neonate unit. This research study will investigate the reasons behind the late initiation of breastfeeding to premature infants after they were fed on a nasogastric tube. If I agree to participate in the study, I will be provided with a questionnaire to complete about my experience as a mother of a premature infant who started breastfeeding before discharge. No identifying information will be included in the questionnaire. I realise that I may not participate in the study if my experience with premature infants is not adequate. I realize that the knowledge gained from this study may help other mothers of premature infants in the future and me.

I realise that my participation in this study is entirely voluntary, and I may withdraw from the study at any time I wish. If I decide to discontinue my participation in this study, I will continue to be treated in the usual and customary manner. I understand that all data will be kept confidential, my identity will not be revealed, during the study, and the information may be used in midwifery presentations, and I should have an ability to understand English to complete the questionnaire

I understand that if I sustain injuries during my participation in the study, I will not be automatically be compensated by the hospital. All study data will be collected by Ms Sibanyoni, will be stored in a secure place, and will not be shared with any other person without my permission

I have read this consent form and voluntarily consent to participate in this study. I understand that I will be given a copy of this signed consent form.
Signature of the subject: Date :
Signature of witness: Date :
Signature of investigator: Date :

ANNEXURE H

DATA COLLECTION INSTRUMENT FOR MOTHERS OF PREMATURE INFANTS

THE QUESTIONNAIRE FOR MOTHERS OF PREMATURE INFANTS

Section 1

Demographic data

1. Age

18 – 22	
23 – 27	
28 – 32	
33 – 37	
38 and above	

2. Marital status

Married	
Divorced	
Widowed	
Not married	

3. Level of education (specify grade)

Never went to school	
Grade 1- 7	
Grade 8 -12	
Tertiary	

4. Occupation

Scholar	
Professional	
Unemployed	
Employed	

If employed specify type of employment : _____

5. Relationship to infant

Mother	
Grandmother	
Aunt	

Other (specify): _____

6. Do you have other children?

Yes	
No	

Number of children that you have

Girls	
Boys	

7. Ages of your children

1 - 5	
6 - 10	
11 - 18	
19 - 25	
26 & above	

8. Children staying with you

In the same household	
In the same premises	

Other (specify): _____

9. Other children staying with you

Sister's child	
Brother's child	
Stepchild	
Other related children	

Section 2

1. Do you have any knowledge of breastfeeding? Explain:
   _____
   _____
   _____

2. What type of knowledge do you have about breastfeeding? Explain

_____
_____
_____

3. How many of your children did you breastfeed?

1	
2	
3	
4	
All of them	
None of the above	

4. Where did you get information about breastfeeding?

Sister at the clinic	
Own mother	
Elder sister	
Magazine/newspaper	
Head from TV, Radio	

Other (specify): _____

5. How did you feel about breastfeeding before you breastfed your own baby?

Positive	
Negative	

I do not know	
Neutral	

6. How do you feel now?

Changed	
The same	
Uncertain	

Please explain

_____

_____

_____

7. Did you breastfeed any of your other children?

Yes	
No	

8. If you did not breastfeed any of your children give reasons

_____

_____

9. Do you know the benefits of breastfeeding your child?

Yes	
No	

10. Mention other methods of infant feeding that you have used in the past

Bottle	
Spoon	
Cup	
Syringe	

11. Many women do not choose to breastfeed because they believe that this method spoils your breasts and it is time-wasting

Strongly agree	
Agree	
Not certain	
Disagree	

12. A premature infant cannot be put on a breast after a nasogastric tube is removed, because the baby is still too small

Strongly agree	
Agree	
Not certain	
Strongly disagree	

13. Other methods of infant feeding should be prohibited on a premature infant before discharged from hospital

Strongly agree	
Agree	
Not certain	
Strongly disagree	

14. Delayed initiation of breastfeeding to premature infants leads to lack of nutrition in the infant's body

Strongly agree	
Agree	
Not certain	
Disagree	
Strongly disagree	

15 Which method of infant feeding would you prefer while your infant is still in the ward?

Bottle	
Breastfeeding	
Spoon	
Cup	
Syringe	

16. Give reasons for the choice of feeding method above

_____

_____

_____

_____

17. Where do you think the first-time mother of a premature infant can get assistance with breastfeeding from?

Ward sister	
Own mother	
Any family member at home	

Other (specify):

_____

_____

18. Do you think mothers of premature babies in the neonate unit get any support from the staff concerning the initiation of breastfeeding?

Please explain

_____

_____

_____

_____

Thank you for completing the questionnaire.

ANNEXURE I

EDITING CERTIFICATE

EDITING CERTIFICATE

Date: 1 April 2019

I, Berdine Smit, ID 7712190011083, hereby certify that the **MASTER OF ARTS** Dissertation by **EDNA JEANETTE SIBANYONI:**

FACTORS ASSOCIATED WITH THE DELAY IN THE INITIATION OF BREASTFEEDING TO PREMATURE INFANTS BEFORE DISCHARGE FROM HOSPITAL

has been edited by me according to the Harvard Author-date System (APA application).

BERDINE SMIT

BA. Publishing (UPE)

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berdine.smit@gmail.com

+(27) 82 882 9534