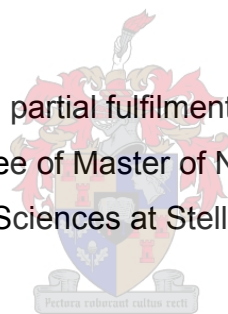


**Knowledge of first time mothers about the importance of tactile
stimulation during infancy and early childhood**

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Thesis presented in partial fulfilment of the requirements
for the degree of Master of Nursing in the
Faculty of Health Sciences at Stellenbosch University



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Declaration

“By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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Abstract

Research indicates that human touch plays an integral role in an infant's ability to thrive and grow, with a correlation existing between tactile stimulation and optimal physical, emotional, cognitive, and social development. The aim of this study was to explore the level of knowledge of first time mothers attending Mowbray Maternity Hospital (MMH) regarding the importance of tactile stimulation during infancy and early childhood.

A descriptive, non-experimental, research design was employed, using a pilot tested structured questionnaire for data collection during face-to-face interviews conducted by the Principal Investigator. Questions were divided into four domains: knowledge about the impact of tactile stimulation on the bonding domain, the emotional domain, physical domain and the social domain of infants and children. The inclusion of one open-ended question allowed participants to suggest recommendations for improved knowledge and care. A sample of 41 participants, constituting 40% of the study population (N=101) was randomly selected from MMH. Prior ethical approval was obtained from the Human Research Ethics Committee of Stellenbosch University, and operational approval from the Western Cape Department of Health, and the Research Committee and Senior Management of MMH. Written informed consent was obtained from the study participants.

The quantitative data was analysed using Statistica (Version 10) with the assistance of a statistician. The qualitative data yielded from the one open-ended question was analysed thematically and then quantified.

The findings show that 90% (n=37) of the participants were knowledgeable about tactile stimulation strategies, 81% (n=33) knew about the impact of tactile stimulation on the bonding domain, 75% (n=31) on the emotional domain, 52% (n=21) on the physical domain and 43% (n=18) on the social domain. Although all participants had reported for out-patient antenatal care on four and more occasions, 73% (n=30) indicated that they had improved their knowledge regarding pregnancy, labour, birth, and parenting by reading magazines, 20% (n=8) reported that a health care worker had spoken to them about the benefits of tactile stimulation, and 15% (n=6) had received literature on the benefits of tactile stimulation. The open-ended question generated

several findings which included suggestions to enhance healthcare by providing information and training about tactile stimulation and perinatal matters when attending antenatal clinic; by offering assistance with infant feeding during the postnatal period; and by improving the attitude and professional stance of health care workers.

The study findings suggest that first time mothers at MMH are not adequately knowledgeable about the importance of tactile stimulation during infancy and early childhood. Grounded in the empirical findings and based on the suggestions offered by the participants, several recommendations, including improved information and training, were identified toward strengthening tactile stimulation knowledge and practice at both the parental and health care provider levels.

Uittreksel

Studies toon dat menslike aanraking 'n belangrike rol in 'n baba se algemene vermoëns om te groei speel, terwyl 'n positiewe korrelasie tussen koestering en optimale fisiese, emosionele, kognitiewe en sosiale ontwikkeling bestaan. Die doel van hierdie studie was om vas te stel of moeders, wat vir die eerste keer geboorte geskenk het, en geskeduleer was om by Mowbray Kraamhospitaal geboorte te skenk, ingelig was aangaande die belangrikheid van streling tydens babaskap en die vroeë kinderjare.

'n Beskrywende, nie-eksperimentele navorsingstudie is uitgevoer, deur van 'n gestruktureerde, onderhoudsvraelys vir die insameling van data gebruik te maak. Vrae was opverdeel in die volgende seksies: kennis rakende die impak van babastreling op die band tussen moeder en baba, kennis rakende die impak op die emosionele dimensie, en kennis rakende die impak van babastreling op die fisiese en sosiale dimensies van babas en kinders. Die ewekansige gekose studie-groep van een-en-veertig deelnemers het 40% van die studie-populasie uitgemaak. Voorafgaande etiese en operationele toestemming is vanaf die Menslike Etiese Komitee van die Universiteit van Stellenbosch, die Wes-Kaapse Departement van Gesondheid en vanaf die Navorsings kommittee en Bestuur van Mowbray Kraamhospitaal verkry. Geskrewe toestemming is voor aanvang van die een-tot-een onderhoude vanaf die deelnemers verkry.

Die kwantitiewe data is met die hulp van 'n statistikus deur die gebruik van die sagteware, Statistica (Weergawe10) geanaliseer. Die kwalitiewe data wat na aanleiding van die oop-eindigende vraag verkry is, is tematies geanaliseer en gekwantifiseer.

Die resultate het getoon dat meeste 90% (n=37) van die deelnemers met die algemene praktyke van babastrelingstrategie gedurende babaskap bekend was. Die persentasie vir deelnemers se kennis rakende die impak van babastreling op die band tussen moeder en baba was 81% (n=33), en vir kennis omtrent die emosionele dimensie 75% (n=31), die impak van babastreling op die fisiese 52% (n=21) en die sosiale 43% (n=18) dimensies van babas en kinders. Alhoewel alle deelnemers vir voorgeboorte kliniek gerapporteer het, het 73% (n=30), terugvoer dat hulle hulle kennis omtrent

swangerskap, geboorte en ouerskap verbreed het deur tydskrifte te lees, 20% (n=8) van die deelnemers gerapporteer het dat 'n gesondheidswerker met hulle omtrent die voordele van babastreling gepraat het, terwyl 15% (n=6) leesmaterial rakende die voordele van babastreling ontvang het. Die oop-eindigende vraag het verskeie bevindings opgelewer met voorstelle met betrekking tot die verbetering van gesondheidsorg en opleiding, opleiding aangaande die voorgeboortelike sorg wat hulle ontvang het en aangaande perinatale aangeleenthede en stimulasie van babas deur streling. Deelnemers het ook voorgestel dat verpleegsters hulp aan moeders behoort te verleen met die voeding van hul babas in die periode na geboorte en dat gesondheidsorgwerkers hulle professionaliteit en gesindhede jeens pasiënte behoort te verbeter.

Ten slotte het die uitkomst van hierdie studie aangedui dat, moeders wat vir die eerste keer geboorte geskenk het by Mowbray Kraamhospitaal, onvoldoende kennis dra oor die belangrikheid van stimulasie van hulle babas en jong kinders deur streling. Gegronde in die empiriese bevindings en gebaseer op die voorstelle van deelnemers, is verskeie aanbevelings geïdentifiseer vir die moontlike verbetering van kennis rakende streling op die ouer- en gesondheidswerkervlakke.

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List of abbreviations used in the thesis

BFHI	Baby Friendly Hospital Initiative
CTDCC	Cape Town Drug Counselling Centre
MDG	Millennium Development Goals
MMH	Mowbray Maternity Hospital
MRC	Medical Research Council
NDoE	National Department of Education
NDoH	National Department of Health
PEP	Perinatal Education Programme
PI	Principal Investigator
PPIP	Perinatal Problem Identification Programme
PMNS	Peninsula Maternal and Neonatal Service
SANCA	South African National Council on Alcohol and Substance Abuse
TIK	Methamphetamine
UCT	University of Cape Town
UN	United Nations
UNICEF	United Nations Children's Emergency Fund
WCDoH	Western Cape Department of Health
WCDoT	Western Cape Department of Treasury
WCP	Western Cape
WHO	World Health Organization

CHAPTER ONE

SCIENTIFIC FOUNDATION OF THE STUDY

1.1 Introduction

Chapter 1 provides the rationale for the study and presents the research problem, the significance of the study, the research question, the aims and objectives, and briefly describes the methodology applied. The ethical considerations are discussed, followed by an outline of the chapters in this thesis.

1.2 Rationale and background literature

During the 1980's and early 1990's, the Principal Investigator (PI), while working as a neonatal nurse practitioner, often incorporated gentle massaging as part of her nursing care plan for critically ill newborn infants. Her observations were that when massaging these infants they would settle down and their oxygen saturation levels would improve. This often resulted in a decrease in assisted oxygen and ventilatory requirements. The acquisition of information and knowledge over the years resulted in the PI generating an interest in wanting to establish whether first time mothers are knowledgeable about the important role that tactile stimulation plays during infancy and early childhood.

Touch, as one of the five senses, fulfils the basic needs of safety, security, comfort, and love in human beings. Tactile stimulation, which includes holding, massaging, rocking, stroking, and skin to skin contact, is an intervention that has physical, emotional and behavioural benefits for all infants from as early as birth (Field, 2004:ix, Blackwell & Cattaneo, 2007:3, Klaus, Kennel & Klaus, 2004:101).

The practice of neonatal massage has for decades been entertained on the Indian subcontinent (Kulkarni, Kaushik, Gupta, Sharma & Agrawal 2010:771). Until recently, tactile stimulation strategies have been overlooked by the health care fraternity in the Western world as a supportive modality for neonatal and infant health (Field, 2004:vii).

A Cochrane review of the evidence for kangaroo mother care (placing an infant dressed only in a nappy and cap in an upright position on the mother's bare chest for maximum skin to skin contact) as a tactile stimulation strategy in low birth weight

infants (birth weight less than 2500 grams), revealed that the infants experienced: (a) daily weight gains of up to 20 grams after the first week of life, (b) improved temperature stability, which resulted in the prevention of hypothermia, (c) stabilised heart and breathing rates, (d) an increased alertness, (e) decreased episodes of crying, (f) a reduction in nosocomial infections, and (g) a reduction in days spent in hospital (Blackwell & Cattaneo, 2007:2). Kangaroo mother care also contributes to better emotional and relational bonds between mothers and their low birth weight infants (Sclarembra & Cattaneo, 2002:9).

Infant massage has been found to elicit the following physiological and behavioural responses in the newborn period: (a) prolonged periods of sleep, (b) enhanced motor development, (c) decreased colic, (d) and a reduction in mothers suffering from postnatal depression (Field, 2004:103). Infant massage also results in improved infant sleep-wake patterns, infant behaviour, a reduction in hospital stay, and improved vagal activity (Kulkarni *et al.*, 2010:771). During the infancy period, massage not only aids the process of “uncurling” from the fetal position of flexion, but also aids the strengthening of muscles, mobilising the joints, and promoting muscle co-ordination and suppleness (Johnson & Johnson, 2002:6).

The incorporation of skin to skin contact between mother and infant during the first hour post delivery, improves the infant feeding and bonding (United Nations Children's Fund (UNICEF), 2006:29), and prevents the manifestation of morbidities such as hypothermia and respiratory distress in newborns (Woods, 2009:137). Tactile stimulation during the early childhood phase also helps to secure connections between the different neural circuits in the brain (Bergman, 2007:82) which help in forming a foundation for future physical and mental health (Bergman, 2007:241).

Seminal studies by Harlow and Zimmerman on rhesus monkeys proved that a lack of tactile stimulation elicited profound negative behavioural and physiological changes, such as the avoidance of social contact, hyper aggressiveness, anger, depression, a decrease in antibody production, and abnormalities in sexual behaviour (Harlow & Zimmerman, 1959:421). In humans, infants who have been deprived of tactile stimulation during infancy were found to have physical and emotional stunting, decreased cognitive abilities, and poor socialisation abilities (Field, 2004:ix, Knight, 2010:2, Bergman, 2007:189).

Statistics in South Africa reveal an upward trend in various health care and social pathology statistics. The Western Cape Province (WCP) is known for its significantly higher low birth weight rates (Berry & Hendricks, 2006:2), a condition that predisposes children to physical, behavioural and cognitive challenges (Kokot, 2010:16).

The Saving Mothers Report for the period 2005 - 2007, reported non-attendance of antenatal clinic (18%) and infrequent antenatal care (6%) as the highest, avoidable, patient related factor that contributed to maternal deaths in South Africa (NDoH, 2008:3). With one of the aims of antenatal care being the provision of education on parenting and child care (Fraser and Cooper, 2005:253), it could be argued that mothers, who do not report for antenatal care, could be entering the parenting role with limited knowledge about the importance of tactile stimulation during infancy and early childhood.

The manifestation of teenage pregnancies has become an ongoing challenge to the various communities in South Africa (Panday, Makiwane, Ranchod & Letsoalo, 2009:41). In 2003, 12% of the South African teenage population fell pregnant, with 14% of the teenager population residing in the WCP falling pregnant (Berry & Hall, 2010:1). The teenage mother's emotional immaturity and limited knowledge and skills (Treas, 2004:63), and the risk of delivering a preterm infant (Pattison, 2009:7) predisposes their infants to tactile deprivation (Treas, 2004:63) and various childhood morbidities (Kokot, 2010:16).

Substance abuse (Sanders, Reynolds, Eley, Kroon, Zar and Davies, 2007:13), poverty (Sanders *et al.*, 2007:13), unemployment (Punt, Pauw, van Schoor, Nyodo, McDonald, Chant and Valente, 2005:16), and decreased levels of literacy amongst primary school learners (Casey, 2009:1) are some of the societal pathologies that many communities in the Cape Metropole region contend with on a daily basis. The question could be asked whether the lack of tactile stimulation during the infancy and the formative years contributes to the manifestation of these societal pathologies.

Perinatal health care settings in the Cape Metropole region are being challenged by a decrease in the utilisation of family planning services, the migration of clients from other provinces and countries (WCDoH, 2009:164), a shortage of skilled midwives, and the saturation of perinatal bed space (WCDoH, 2009:161), factors that negatively

impact the nurse-patient ratio, and in turn negatively impacts on patient care, especially the provision of patient education.

The literature review examines a cross section of historical and more recent studies on the benefits of tactile stimulation during infancy and early childhood. Many of these studies have explored the correlation between tactile stimulation strategies and various physiological functioning (Kulkarni *et al.*, 2010:773), and behavioural outcomes (Cristo, 2002:11).

The growing body of evidence on the benefits of tactile stimulation (Bergman, 2003:21, Kulkarni *et al.*, 2010:773; Cristo, 2002:11) and on the detrimental effects of tactile deprivation (Taylor, Lillis and LeMone, 2005:394; Blackwell & Cattaneo, 2007:3; Field, 2004:ix; Perry, 2001:5), demonstrate the need to investigate the knowledge of first time mothers about the importance of tactile stimulation during infancy and early childhood.

1.3 Research problem

Findings from the literature have revealed both the positive impact of tactile stimulation (Field, 2004:vii) *versus* the negative impact of tactile deprivation (Taylor, Lillis and LeMone, 2005:394) on the immediate and long-term health and wellbeing of infants and children. The literature review undertaken during this study did not identify any published or unpublished works regarding the knowledge of first time mothers about the importance of tactile stimulation during infancy and the early childhood period. The generation of such information is essential in order to promote tactile stimulation as a strategy towards the reduction of childhood morbidity and mortality.

1.4 Significance of the study

With a steady increase in the under five year old mortality rates over the past decade, South Africa is currently working at identifying gaps within the health care system that could contribute to reducing the number of neonatal and child deaths in the country (Pattison, 2010:141). Basic neonatal care has been identified as a key factor in meeting the Millennium Development Goal of reducing by two thirds the mortality of infants and children under the age of five years by the year 2015 (Pattison, 2010:141). The implementation of tactile stimulation strategies such as skin to skin care (UNICEF, 2006:29), kangaroo mother care (Blackwell & Cattaneo, 2007:2), and newborn

massage (Kulkarni *et al.*, 2010:771) could therefore aid in reducing the current morbidity and mortality statistics in South Africa. Further, with the expanding evidence that an absence of tactile stimulation contributes to physical, cognitive, and emotional stunting (Field, 2004:vii), it is imperative to determine whether first time mothers are knowledgeable about the important role that tactile stimulation plays during infancy and the early childhood period. The findings of the study could be used toward strengthening tactile stimulation knowledge at both the parental and healthcare provider levels.

1.5 Research question

The research question being explored during this study was: *“Are first time mothers, attending Mowbray Maternity Hospital in the Cape Town Metropole, knowledgeable about the importance of tactile stimulation during infancy and early childhood?”*

1.6 Research aim

The aim of this study was to explore the level of knowledge of first time mothers attending Mowbray Maternity Hospital (MMH), regarding the importance of tactile stimulation during infancy and the early childhood development period.

1.7 Research objectives

The specific objectives of this study were to:

- (a) Establish the existing level of knowledge of first time mothers about tactile stimulation strategies during infancy and early childhood,
- (b) Determine the existing level of knowledge of first time mothers regarding the impact of tactile stimulation and tactile deprivation on the bonding relationship, and the emotional, physical, and social domains of infants,
- (c) Ascertain whether information about tactile stimulation is being provided by health care workers, and
- (d) Identify recommendations, as proposed by the study participants, towards strengthening knowledge about the importance of tactile stimulation during infancy and early childhood at both the parental and healthcare provider levels.

1.8 Research methodology

The research methodology employed in this study is briefly discussed in the following subsections, i.e. research design, population and sampling, data collection tool, pilot study, validity and reliability, data collection, data analysis, and ethical considerations.

1.8.1 Research design

A descriptive, non-experimental, research design was employed, using a primarily quantitative approach.

1.8.2 Population and sampling

This study was undertaken at MMH, a secondary level referral hospital, situated in the Cape Town Metropole.

For this study, first time mothers were sampled, who matched the following inclusion criteria:

- (a) Aged between 18 and 25 years,
- (b) Expected delivery date between the 1^s and 31st of December 2008, and
- (c) Delivered a live infant (infants in the case of multiple births).

For this study, first time mothers were excluded who:

- (a) Had a perinatal loss (miscarriage, stillbirth, neonatal death),
- (b) Had given their infant(s) up for adoption, and
- (c) Were more than ten days post delivery.

During the one-month sampling period (December 2008), a total of 101 participants were found who matched the inclusion criteria. In consultation with a statistician at the Stellenbosch University, Prof Martin Kidd, it was determined that, for the purpose of this study, a random sample of 41 (40.6%) minimum would be sufficient for data analysis and for controlling sampling errors. Accordingly, a systematic random sample of 50 (49.5%) of participants was drawn from the study population (N=101). Of those selected (n=50), nine did not participate. Consequently, a statistically representative

sample of 41 (40.6%) was drawn from the study population (N=101) in accordance with the calculation of the statistician.

1.8.3 Data collection tool

The PI undertook the data collection by means of a structured interview questionnaire (Appendix A) during face-to-face interviews. The questionnaire was developed by the PI, based on the findings from the literature review, and coupled with recommendations from an expert in the field of tactile stimulation (Dr Nils Bergman, Independent Public Health Physician), and with the guidance from a nursing researcher (Dr. Frederick Marais, Stellenbosch University), as well as the statistician (Prof. Martin Kidd, Stellenbosch University).

The questionnaire comprised predominantly closed ended questions, covering several domains. The questionnaire also contained one open ended question for allowing participants the opportunity to provide further comments and / or recommendations. The questionnaire was printed in English as all the interviews were planned to be conducted by the PI. In cases where language barriers arose, multi-lingual health care workers from MMH provided assistance.

1.8.4 Pilot test

A pilot study comprising 7 (17%) of the study sample was conducted to test and refine any possible problems concerning the overall methodology, the research approach, questionnaire, and method of analysis. No changes were required. The pilot test sample and data were excluded from the final empirical study.

1.8.5 Validity and reliability

The structured interview questionnaire was tested for face validity through the pilot test. Content validity, including the appropriateness of the key domains and variables, used in the questionnaire was ensured by the findings from the literature and evaluative input from experts in the fields of tactile stimulation (Dr Bergman, Independent Public Health Physician) and research methodology (Dr Marais, Stellenbosch University).

Reliability was enhanced by means of the pilot test in order to ensure complete and consistent capturing of the required data. Reliability was further enhanced by the PI

undertaking all the data collection personally. In addition, based on the data yielded from the pilot test, the statistician evaluated and confirmed the feasibility of the questionnaire and the method of data analysis.

1.8.6 Data collection

The PI obtained written informed consent from each participant prior to data collection. Where a language barrier was identified, multilingual healthcare workers, employed at MMH assisted with the translations. Data collection took place over a one month period from the 1st to the 31st December 2008.

1.8.7 Data management and analysis

The data obtained from the structured questionnaires were captured into Microsoft Excel (office 2010) by the PI, and then validated by cross checking against all questionnaires for completeness and accuracy. The data was analysed using Statistica software (Version 10) with the support of the statistician, Prof Kidd. The primarily descriptive data was expressed in frequency tables, means, and proportions. The chi-square, Mann Whitney, Spearman, and Fisher LSD tests were used to determine associations between the variables. A 5% ($p \leq 0.05$) significance level was used as a guideline for determining statistically significant relationships. A thematic and subsequent quantifying approach (Culp & Pilat, 1998:3) was used to analyse the qualitative data yielded from the open ended question.

1.8.8 Ethical considerations

Ethical approval for the study was obtained from the Committee for Human Research Ethics, Faculty of Health Sciences, Stellenbosch University (Appendix B). Operational approval was obtained from the Western Cape Province Department of Health (Appendix C); and from the medical superintendent, nursing manager and the Research Committee at MMH (Appendix D).

Prior written informed consent was obtained from each participant (Appendix E). Several measures were taken to ensure confidentiality and anonymity. The questionnaires were coded and no personal identifying information was collected. The consent forms were completed and stored separately from the questionnaires. Where

translation was required, multilingual nursing staff from MMH were asked to assist in order to prevent any bias and to maintain confidentiality and data validity. In the case of participants having an emotional breakdown, the plan of action was to refer her to the resident social worker for counselling and support; this was not required. Only the PI had access to the completed questionnaires, which were stored in a locked cabinet at her workplace.

1.9 Definitions used in the study

1.9.1 Baby Friendly Hospital Initiative (BFHI)

The BFHI is a worldwide movement that was introduced by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) in 1991, with the aim of providing each infant with the best possible start in life, by creating a health infrastructure, with breastfeeding being the norm (UNICEF, 2006:3).

1.9.2 Early childhood development

According to the National Integrated Plan for Early Childhood Development in South Africa in 2005 to 2010, early childhood development refers to the application of policies and programmes for infants and children from birth to nine years of age, with a special focus on the birth to four-year old group (UNICEF, 2005:6). For the purpose of this study, the early childhood development phase represents the age group from birth up to four years.

1.9.3 Hypothermia

It is a skin temperature of less than 36°C, or an axillary temperature (taken under the child's arm) of less than 36.5°C in newborn infants (Woods, 2009:135).

1.9.4 Kangaroo mother care

Kangaroo mother care is an alternative way of caring for low birth weight infants. The infant is placed in an upright position on the mother's bare chest. Infants are only dressed in a diaper and a cap to allow for maximum skin to skin contact between mother and child (Woods, 2009:137).

1.9.5 Low birth weight infant

An infant weighing less than 2500 grams at birth (Woods, 2009:47).

1.9.6 Perinatal period

The perinatal period is defined from the beginning of fetal viability until the end of the sixth day after birth. In the context of South Africa as a developing country, viability begins after 28 weeks (Pattison, 2008:7)

1.9.7 Perinatal loss

A perinatal loss refers to a mother who has had a:

- Miscarriage (termination of a pregnancy before the 27th week of pregnancy),
- An intrauterine death (death of the fetus after the 27th week of pregnancy and before its birth), or
- An early neonatal death (death of an infant within the first seven days of birth). (Fraser & Cooper, 2005: 696)

1.9.8 Preterm

An infant that is born before the 37th week following conception (Woods, 2009:46).

1.9.9 Protest despair response

When newborn infants are removed from their mothers for prolonged periods of time, they experience a phenomenon, known as the “protest despair response”. The “protest” aspect of this response is recognised by a continuous crying activity, indicating the need for the infant to be reunited with the mother. The “despair” response is a withdrawal/survival response, recognised by a drop in body temperature, drop in heart rate and a surge in stress hormones. When the infant and mother are reunited, a rapid increase in body temperature and heart rate occurs. This response creates unfavourable changes in the infant’s brain, which could result in negative behavioural patterns that are irreversible and lifelong (Bergman, 2003:23).

1.9.10 Skin to skin contact

Skin to skin contact refers to creating an environment that allows for maximum skin to skin contact between a mother and infant (Field, 2004:118).

1.9.11 Tactile stimulation

Tactile stimulation includes touching, holding, cuddling, massaging, rocking, stroking and skin to skin contact which has proven to have physical, emotional and behavioural benefits for all infants from as early as birth (Field, 2004:ix). The concepts of touch therapy and tactile stimulation are normally used interchangeably. For the purpose of this study, the term tactile stimulation is used.

1.9.12 Thermoregulation

Thermoregulation refers to the maintenance of an axillary temperature of 36.5°C - 37.0°C in newborn infants (Woods, 2009:134).

1.9.13 Underweight for gestational age

Underweight for gestational age refers to infants having a birth weight that is below the 10th centile for their gestational / development age (Woods, 2009:48).

1.10 Timeframe

The process of conducting this study occurred over a period of eight months. During this period, the birth register of MMH was examined to calculate the average number of deliveries of first time mothers for the period between January and June 2008. In September 2008, a sample frame of mothers fitting the inclusion criteria was randomly compiled. Systematic random sampling followed by data collection took place during the month of December 2008.

1.11 Chapter outline of the thesis

Chapter 1: Scientific foundation of the study

Chapter 1 briefly outlined the background to, rationale for, and aim and objectives of this study. This chapter provided a brief overview of the research methodology and the conceptual framework applied in the study.

Chapter 2: Literature review

Chapter 2 presents the findings from the review of relevant literature for constructing evidence regarding the effect of both tactile stimulation and tactile deprivation during infancy and early childhood. Both primary and secondary source materials were consulted during the literature review.

Chapter 3: Research methodology

Chapter 3 describes the research methodology used in the study.

Chapter 4: Data analysis, interpretation and discussion

Chapter 4 presents and discusses the results of the study.

Chapter 5: Conclusions

Chapter 5 summarises the achievement of the study objectives, discusses the identified limitations of this study, presents the proposed recommendations, and draws together the final study conclusions.

1.12 Conclusion

Chapter 1 introduced some of the many benefits associated with tactile stimulation and the potential risks associated with tactile deprivation. Based on the literature findings, the importance of first time mothers to be informed about the importance of tactile stimulation during infancy and early childhood and, conversely, about the risks associated with tactile deprivation, was recognised. Although an integrated plan to address early childhood development matters has been established in South Africa (UNICEF, 2005:10), to date of this study, no evidence was available to confirm that a programme for informing first time parents about the importance of tactile stimulation during infancy and early childhood existed. Furthermore, the literature study revealed no published or unpublished works regarding the knowledge of first time mothers about the importance of tactile stimulation during infancy and early childhood. The purpose of

this study therefore was to explore the knowledge of first time mothers, aged between 18 and 25 years, attending MMH about the importance of tactile stimulation during infancy and early childhood.

Chapter 2 presents the findings from the literature review which underpinned the development of the research focus and approach.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Chapter 2 presents relevant findings from the reviewed literature. Burns and Grove (2007:135) state that literature reviews “provide you with the current theoretical and scientific knowledge about a particular problem, resulting in a synthesis of what is known and not known”. The undertaken literature review set out to explore existing evidence concerning the importance and the impact of tactile stimulation during infancy and early childhood. The review also explored whether perinatal facilities in the Cape Town Metropole region had the infrastructure to adequately inform first time mothers about the importance of tactile stimulation during infancy and the early childhood development phases. This chapter furthermore describes the conceptual framework that had been developed for and applied during this study.

2.2 Selecting and reviewing the literature

The sources consulted for this literature review comprised a combination of both primary and secondary source materials, obtained from electronic databases, hand searching of periodicals, journals, different monographs (e.g. conference proceedings, pamphlets and books on tactile stimulation), as well as searching through different reference lists. Various reports (governmental reports on health related matters, as well as non-governmental reports on societal matters) were also explored during the literature study. Both empirical and theoretical studies undertaken had been reviewed for the purpose of explaining the subjects of tactile stimulation and mother-infant attachment theories. Although the aim was to select material not older than ten years, seminal studies from earlier time periods have also been included.

Key words used in the literature searches included touch, tactile stimulation, touch therapy, tactile deprivation, first time mothers, knowledge, infancy, and early childhood.

Pubmed, Medline, and Cochrane Library searches brought about a myriad of publications on tactile stimulation during the newborn period, infancy and childhood. Many of the studies searched focused on the effect that tactile stimulation has on the

physiological, emotional and behavioural aspects of infants and children. The reviewed literature, however, uncovered no published or unpublished data regarding the level of knowledge of first time mothers about the importance of tactile stimulation during infancy and early childhood.

2.3 Findings from the literature

The literature review findings are described under the following headings, i.e. animal related studies, human fetal development, tactile stimulation during the early childhood period, tactile stimulation and maternal wellbeing, tactile deprivation, societal trends, and factors that influence the acquisition of patient information.

2.3.1 Animal related studies

Monkeys and apes, due to their similarities to humans in behaviour, anatomy and physiology, have offered touch researchers with valuable insights into human development. The ability to selectively breed and rear monkeys and apes under controlled settings, their availability to do daily observations and physiological tests and their age from birth to maturity being three to four years, have allowed for researchers to perform longitudinal studies in tactile stimulation and tactile deprivation (Lovgren, 2005:1).

Burns and Grove refer to a landmark study as an important research project that has a major influence on either a specific discipline, or on society as a whole and forms a foundation for the generation of additional studies (2007:139). During the mid fifties, a landmark study by Harlow (1958: 1, 2) showed that monkeys that were exposed to two surrogate mother figures providing nutrition (the one made of a light source, covered with a terry cloth that provided heat, and the other made of wire mesh), tended to attach themselves to the terry cloth figure rather than the mesh wire, thus confirming the overwhelming importance that contact comfort plays in the development of affectionate responses in monkeys. Ongoing seminal studies during this time period have aided in identifying the immediate and long-term effects of tactile stimulation and tactile deprivation on the physical, emotional and social behaviour of rhesus monkeys (Harlow & Zimmerman, 1959:421). Infant monkeys who had been raised away from their mothers for the first few months of their lives, showed a variety of immunological deficits that persisted long after these monkeys were reunited with their mothers

(Harlow & Zimmerman, 1959:429). Studies done on rats elicited similar outcomes. Mother-infant pup interactions were found to play an important role in regulating growth and development whereas interruptions of the maternal tactile input contributed to marked short term behavioural and physiological stress responses such as change in temperature, heart rate, and growth retardation and developmental delays following long term tactile deprivation (Schanberg & Field, 1987:431).

With research proving the important role that tactile stimulation plays in the lives of non-human primates, ongoing studies in the animal kingdom continues to provide valuable insights with regards to the effects that tactile stimulation, or tactile deprivation, could have on human beings.

2.3.2 Human fetal development

The skin is the largest sense organ in the human being, with touch being one of the first senses to develop in the human fetus (Slater & Lewis, 2006:54). From as early as the eighth week of pregnancy, the fetus is already exposed to the touching of the gentle pressure of the amniotic fluid against its skin (Slater & Lewis, 2006:55). The continuation of tactile stimulation post delivery, not only aids the infant in adapting to extra-uterine life (Buschbach & Bordeaux, 2002:36), but also plays an integral role in important physiological processes such as the development of neural pathways, thus laying the foundation for future optimal functioning (Bergman, 2007:19).

2.3.3 Tactile stimulation during the early childhood period

The National Integrated Plan for Early Childhood Development in South Africa describes the early childhood development period as the age from birth to four years (UNICEF, 2005:6). Numerous studies during the early childhood period attest to the benefits that tactile stimulation has on the overall health of infants and children.

2.3.3.1 Genetic capacity

In his article, "Bonding and attachment in maltreated children", Perry (2001:2) describes that infants enter extra-uterine with a genetic capacity to form and maintain healthy emotional relationships. The release however of this genetic capacity is aided

by the presence of attentive, responsive and loving care and touch during the early development period.

With genetics only playing a partial role in the brain development of infants (Perry, 2001:2) and sensory stimulation which includes tactile stimulation contributing to optimal physical, emotional and intellectual development, it is imperative that all caregivers especially first time mothers be informed of the pivotal role that they can play in the release of infants and children's overall health and development (Cohen, 2009:3).

2.3.3.2 Sensitive period post delivery

The first ninety minutes post delivery is a sensitive period, during which parent-infant bonding in humans is most optimal (Klaus *et al.*, 2002:101). The infant during this period is more alert, responding to the touch, voice, appearance, and the smell of the parent (Treas, 2004:142). Positive touch and stroking during this sensitive period aids in enhancing the bonding relationship between mother and infant (Buschbach & Bordeaux, 2002:36).

In light of the positive effects of skin to skin contact between a mother and her newborn infant (Blackwell & Cattaneo, 2007:2), it is important, where possible, to encourage the non-separation of the mother and her infant at least for the first hour post delivery, unless where the condition of the mother or infant necessitates separation (UNICEF, 2006:29). Bergman (2007:243) emphasises that the separation of mothers and newborn infants is undesirable and disrupts the inherent plan of a mother and her newborn infant.

2.3.3.3 Bonding and newborn attachment

The sense of touch is the most highly developed of all the senses at birth and is essential for the normal development of the awareness of self, as well as of others (Taylor *et al.*, 2005:350).

Bonding can be described as a secure relationship that is generated by the emotional investment that parents make in the lives of their children. It is a process that grows with repeated tactile experiences, such as touching, holding, stroking and is mutually meaningful and pleasurable to both parent and child (Klaus *et al.*, 2002:110). Tactile

experiences cause specific neuro-chemical activities in the brain, which lead to normal organization of brain systems that are responsible for attachment (Perry, 2001:2). The inability of the mother to establish the bonding relationship with her infant during the post delivery period could result in non-attachment, emotional detachment, and/or the potential for physical abuse (Treas, 2004:142).

Perry (2002:2) refers to attachment as the first core strength which plays an essential role in the generation of healthy emotional development in human beings. Attachment is created through the initial interaction that an infant has with its primary caregiver, usually the mother, during the immediate postnatal period. The attachment relationship between an infant and the primary care giver during the infancy period continues to grow as the care giver continues to provide the infant with soothing, comforting, and pleasurable activities. The loss, or threat of loss of this special person, can lead to the creation of intense distress for the infant (Perry, 2002:4, Bergman, 2007:169). Attachment can contribute to a child either generating a sense of security and calm or insecurity and anxiety – patterns which may carry into adulthood (Taylor *et al.*, 2005:823, Bergman, 2007:241).

2.3.3.4 *Brain development and intelligence*

Between the gestational ages of ten and twelve weeks, the fetal brain undergoes a burst of co-ordinated neural activity (Bergman, 2007:5). During the rest of the pregnancy period, ongoing migration of neurons to specific locations in the brain continues to take place (Semrud-Clikemen, 2012:3). At birth however, the refinement of the neural pathways is no longer a spontaneous process, but is dependent on early interpersonal events such as sensory stimulation to aid the structural organisation of the brain (Bergman, 2007:25).

The human brain reaches 80% of it's total size by the age of twenty one months post delivery (Bergman, 2007:105), with the remaining 20% of growth taking place from this point until adulthood (Bergman, 2007:103). During the first three years of a child's life, the stimulation that the child receives, aids in the ability to think and speak, learn and reason, and generate a sound basis for values and social behaviour (NDoE, 2001:2), thus showing the importance of optimising tactile stimulation during the early childhood period for optimal neural development.

During the early childhood period, windows of opportunity exist during which the brain is primed to receive sensory input for the development of more advanced neural pathways, such as those responsible for language, intelligence, sociability and curiosity (Bergman, 2007:82), with the outcome of these emotional and intellectual developments often only become evident once the child reaches grade three or four (Montessori, 2010:1). Deprivation of a stimulating environment results in neural connections and synapses functioning sub-optimally, or getting to a point of seizing to function (Knight, 2010:1).

The experiences during the first three years of a child's life play an important role in establishing a platform for the future development of higher cognitive functioning (Bergman, 2007:191). The purpose of early childhood development programmes is therefore vital in protecting every child's right to develop his/her cognitive potential (NDoE, 2001:3). South Africa has embraced various early childhood development strategies to ensure that children develop holistically (NDoE, 2001:4). Literature shows that inadequate human interaction during the formative years prevents approximately 200 million children globally from reaching their full potential in cognitive and socio-emotional development (Borisova, Grossman & Rigg, 2010:2).

2.3.3.5 *Physiological responses*

In a randomised control study to measure cardio-respiratory stability, newborn infants receiving skin to skin care, were compared with a control group receiving conventional, incubator care. The results showed that after six hours, 100% of the group exposed to skin to skin contact achieved cardio-respiratory stability, with only 50% achievement in the control group (Bergman, 2003:23).

Tactile stimulation during the newborn period also contributes to the reduction of stress hormones, an increase in the secretion of growth hormone and the boosting of the immune system (Buschbach & Bordeaux, 2002:36).

A Cochrane review (Blackwell and Cattaneo, 2007:2) of the evidence for kangaroo mother care in low birth weight infants (birth weight less than 2500 grams), revealed that infants experienced: (a) daily weight gains of up to 20 grams after the first week of life, (b) improved temperature stability, which resulted in the prevention of hypothermia, (c) stabilised heart and breathing rates, (d) an increased alertness, (e) decreased

episodes of crying, (f) a reduction in nosocomial infections, and (g) a reduction in the number of days spent in hospital.

Sleep, an important feature in the life of human beings, is necessary for self regulation and growth. In a study to determine the effect of massage therapy on the sleep patterns of infants, mothers were instructed to massage their infants for 30 minutes following their evening bath routines, while the control group performed the usual bath routines without giving their infants a massage. The outcome of the study showed that the infants who had been massaged, reached favourable rest activity cycles by the age of eight weeks (Field, 2004:183).

A meta-analysis of data from nineteen studies on infant massaging showed that nearly three quarters of the infants responded positively, with infants preferring deeper pressure massaging to being lightly stroked (Field., 2004:107).

2.3.3.6 *Tactile stimulation and self esteem*

Self esteem develops from how competent children think they are at different stages of their lives and from the amount of social support that they receive. Stages in the development of one's self concept occur over the first six to seven years of a child's life. Since interaction, in the form of holding and cuddling during infancy, plays an important role in the development of a child's self esteem, the lack of adequate body and sensory stimulation during infancy may negatively influence the self concept of a child, which in turn could have an impact on his/her self esteem (Taylor *et al.*, 2005:823).

In a longitudinal study in which 482 infants had been monitored from the age of eight months through to adulthood, it was found that infants who had received more physical affection and love from their mothers during their formative years, were better able to cope with stress and anxiety during adulthood, had better social skills, felt secure in relationships and coped better with difficulties in life (Derbyshire, 2010:25).

2.3.4 *Tactile stimulation and maternal wellbeing*

Ensuring that mothers experience a sense of wellbeing during the perinatal period not only positively affects the mother, but aids in setting a foundation for secure attachments with their infants (Klaus *et al.*, 2002:101)..

2.3.4.1 Birth companionship

Mothers who received regular touch input during their labour and delivery period spent less time away from their infants during the first twenty four hours, showed a higher incidence of exclusive breastfeeding at six week post delivery, touch and soothed their crying infants twice as many times as the control group (Klaus *et al.*, 2002:104). The research proves that massaging and touching mothers during labour motivate mothers to interact and touch their infants thus feeding positively into the secure attachment process.

2.3.4.2 Bonding

In a study by Scaletbra and Cattaneo (2002:9), the emotional responses and interactive behaviours of nineteen mothers, providing kangaroo mother care to their newborn infants, were compared to twenty-one mothers, whose infants received conventional incubator care. Using the Parent Stress Index Questionnaire, the maternal stress of these mothers was measured immediately post delivery and then again prior to their discharge from hospital. The results reflected similar scores for both groups immediately post delivery, whereas at discharge, a marked reduction in emotional stress and an increase in interactive behaviour were observed in the mothers who had provided their infants with kangaroo mother care, further confirming that kangaroo mother care, as a tactile stimulation strategy, contributes to a better emotional and relational bond between mothers with preterm infants.

2.3.4.3 Effects of oxytocin

Skin to skin contact combined with breastfeeding affords mothers many physiological benefits. Effective breastfeeding generates the release of the hormone oxytocin which not only aids in milk production, but also has a contractile effect on the mother's uterus, thus decreasing her risk of bleeding. Oxytocin also causes vasodilatation of the mother's chest, which enhances the mother's sense of relaxation and wellbeing, as well as increasing her pain threshold, thus assisting her in coping with her newborn infant (Field, 2004:196).

2.3.5 Tactile deprivation

Tactile deprivation, a term predominantly used in the infancy period, refers to the lack of tactile stimulation. If continued for a prolonged period it has the potential of serious

developmental and emotional disturbances such as stunted growth, personality disorders and social regression (Knight, 2010:2).

Depending on the severity of the tactile deprivation, the manifestation thereof may range from interpersonal discomfort to profound social and emotional problems (Perry, 2001:1, Bergman, 2007:181)). Some of the behavioural patterns brought about by tactile deprivation include developmental delays, odd eating behaviours (hoarding food, swallowing problems, eating as if they would never have food again), and self soothing behaviours (head-banging, rocking, cutting themselves (Perry, 2001:8.)). In the case of chronic deficit of tactile deprivation and nurturing, children may be at risk of losing their capacity to form meaningful relationships later in life, (Perry, 2001:4).

2.3.5.1 *Impact of tactile deprivation on stress levels*

Cortisol is a hormone that is secreted by the adrenal glands in response to any stressful event, causing a rise in heart rate and blood pressure. When cortisol levels remain elevated for prolonged periods of time, it has detrimental effects on the various body systems (Schoenfeld, 2003:29).

When newborn infants are removed from their mothers for prolonged periods of time, they experience a phenomenon, known as the “protest–despair” response. The “protest despair” response, also known as the hyperarousal/disassociation response manifests when an infant is separated from its mother. The “protest” aspect of the response is recognised by continuous crying, indicative of the infant’s need to be reunited with its mother. The “despair” response is a withdrawal / survival response, recognised by a drop in body temperature, and heart rate and a surge in stress hormones. When the infant and mother are reunited, a rapid increase in body temperature and heart rate occurs, which creates chaotic biochemical alterations and the development of a toxic neurochemistry in the brain, resulting in negative behavioural patterns that are irreversible and lifelong (Bergman, 2003:23).

In a randomised control study performed on 84 full-term infants, the salivary cortisol levels of infants who stayed with their mothers were compared with that of infants who continued receiving routine care, but were separated from their mothers. Six hours post birth the salivary cortisol levels of the infants separated from their mothers were

exceptionally high compared with the group that remained with their mothers being much lower (Field, 2004:117).

Stressful incidents, such as vaccinations, the presence of strangers and infant-mother separation, produce increased levels of cortisol during the infancy period. By the age of two years, children who are exposed to ongoing, insecure attachments with their primary caregivers, continued to show elevated levels of cortisol, whereas children who experienced secure attachments with their mothers during infancy did not have such surges of cortisol, even when subjected to stressful incidents (Gunnar & Cheatham, 2003:203).

When infants are forced to use their stress related paths during infancy, the pleasure related paths are pruned away, resulting in the stress driven neurological pathways gaining dominance. Although the brain has the ability to compensate for various losses later in life, this does not apply to the loss of the pleasure related paths during infancy. Failure to rectify this foundation early in life, contributes to defective mental health and the inability to be flexible in various life situations (Bergman, 2004:1).

Practices such as the separation of the mother and the infant post delivery to allow the mother to recover from the birthing experience, the separation of the infant from the mother during the first hour post delivery for weighing and bathing purposes, and the admission of an infant born by caesarean section to a neonatal unit for a brief observation period (Johnson & Johnson, 1998:23) are being replaced by practices such as skin to skin contact immediately post delivery, keeping healthy mothers and healthy newborn infants together for 24 hours a day (UNICEF, 2006:3-37), infant massage (Kulkarni, 2010:771) and kangaroo mother care (Blackwell & Cattaneo, 2007:2). These practices aim to prevent the negative effects of the protest-despair response in newborns (Bergman, 2003:23) during the immediate post delivery period when vital mother-infant bonding occurs (Blackwell & Cattaneo, 2007:2).

2.3.5.2 *Impact of tactile deprivation on behavioural patterns*

Good mother-infant attachment generates efficient right brain regulation, and this in turn creates a platform for optimal infant and adult mental health. Conversely, the lack of skin to skin contact contributes to poor mother-infant attachment, which negatively

influences right brain regulation and thus poor infant and adult mental health (Bergman, 2007:191).

In cases where children are exposed to ineffective affection, nurturing and care giving experiences during infancy and early childhood, they often show a lack of ability to engage in normal interactions with other human beings (Cohen, 2009:5). These children, when older, are difficult to “mould” and teach, displaying a decreased ability to generate a sense of pleasure from words and actions of affirmations, received from teachers or parents (Kokot, 2010:16). In extreme cases, children with a poor attachment capacity, due to ineffective affection, often show no remorse when hurting others and are at risk of developing anti-social, aggressive and violent behaviour later in life (Perry, 2001:6).

A cross cultural study among preschoolers found that French parents touched their children 43% of the time compared with American parents who touched their children 11% of the time. Affectionate touch amongst the same groups of children reflected a percentage of 23% in the French group and 3% in the American group whereas aggressive touch amongst the same groups of children took place 1% of the time amongst the French group and 37% amongst the American group (Field, 2004:x). The study shows that a lack of tactile stimulation between parents and their children directly impacts on the amount of affection or aggression that children display towards each other, emphasising the significant behavioural impact that tactile stimulation has over a person’s life continuum, from infancy and early childhood through to adulthood (Field, 2004:100). In families where children experience emotional neglect, it is common for the abuse to be transgenerational i.e. the neglect is passed on from generation to the next (Perry, 2001:5), subjecting future generations to the consequences of tactile deprivation.

Teenage pregnancies (Treas, 2004:63), substance abuse (Sanders *et al.*, 2007:13), delivery of low birth weight infants (Kokot, 2010:16) and decreased levels of literacy amongst school learners (Casey, 2009:1) are all factors that have the potential of exposing children to tactile deprivation and the risk of perpetuating the deprivation and consequences, due to the potential risk of its transgenerational effect. Research studies have shown that tactile stimulation strategies have the potential of feeding positively into secure infant attachments (Bergman, 2007:191), optimal emotional and

mental health (Cohen,2009:3), decreased aggression amongst toddlers (Field, 2004:x), and a reduction in anti-social and violent behaviour later in life (Perry.2001:1).

2.3.6 Societal trends

Low birth weight accounts for a large proportion of South African births (Berry & Hendricks, 2006:2) and deaths of children aged five years and younger (NDoH, 2008:9). This poses a challenge to communities due to low birth weight infants being susceptible to emotional and behavioural problems such as aggression, Attention Deficit Hyperactivity Disorder, perceptual disorders and lowered intelligence (Kokot, 2010:16). A lack of tactile stimulation during the early childhood development period has also been found to lead to societal trends such as teenage sexual activity, violence, addictions and self-mutilation (Knight, 2010:1).

2.3.6.1 Low birth weight

Birth weight plays a crucial role in determining perinatal, neonatal, and post neonatal outcomes in children (Corrigal, Pienaar, Matzopoulos, Bourne, Bradshaw, Draper, Chopra & Sanders, 2007:6). Annually, more than 20 million infants worldwide are born weighing less than 2500 grams, resulting in a global low birth weight rate of 15% (Corrigal *et al.*, 2007:4). For the period 2006 – 2007, low birth weight was the main course for neonatal deaths in South Africa (NDoH, 2008:45). Table 1.1 shows a breakdown of the national low birth weight statistics for the year 2006.

Table 2.1: Low birth weight statistics in South Africa (Hendricks & Berry 2006:1)

Province	2006
	Proportion (%)
Eastern Cape	9.6
Free State	14.3
Gauteng	0.6
Kwazulu-Natal	9.2
Limpopo	7.8
Mpumalanga	7.8
North-West	11.9
Northern Cape	24.5
Western Cape	16.6

Due to the low birth weight infant's inability to thermo-regulate, hypothermia is one of the greatest risks, a condition that contributes significantly to infant mortality in under-resourced settings (Woods, 2009:51). With many of these deaths occurring at community hospital level, it is imperative that tactile stimulation strategies be utilised as a core strategy to provide basic neonatal care in order to dent morbidity and mortality figures in South Africa (NDoH, 2008:10).

Low birth weight is not only associated with physical conditions, such as poor immunity and deficiency in thermoregulation (Woods, 2009:51), but also poses the risk for developing motor, cognitive, behavioural, emotional, and intellectual problems (Corrigal *et al.*, 2007:9). Some of these problems include negative temperament characteristics such as aggression, anxiety, and depression; attention deficit hyperactivity disorder; low levels of social competence; perceptual disorders and low intelligence (Kokot, 2010:16).

A study to determine the neurodevelopment of preterm infants from low-resourced family settings revealed the following results: at the mean age of 31 months, 32% of the infants showed normal development, 45% had mild neuro-developmental impairments, whilst 23% had serious neuro-developmental impairments. Preterm infants from low-resourced settings therefore have an increased risk for neuro-developmental impairments (Khan, Muslima, Parveen, Battacharya, Begum, Chowdhury, Jahan & Darmstadt, 2006:282). Preterm

Studies show that low birth weight infants are vulnerable to both physical, emotional and behavioural conditions (Kokot, 2010:16) which could be alleviated by tactile stimulation strategies (Kulkarni 2010:772; Bergman, 2007:226; Blackwell & Cattaneo, 2007:3).

2.3.6.2 Antenatal care

One of the aims of antenatal care is to offer women education in preparation for parenthood (Fraser & Cooper, 2005:253), which includes information such as the importance of tactile stimulation during infancy and the early childhood period.

The Saving Mothers Report (NDoH, 2008:317) states that the second highest patient related factor that contributed to maternal deaths in the WCP for the period 2005 – 2007 was non-attendance of antenatal clinic (18%) and infrequent antenatal care (3%).

Teenagers, who fall pregnant, are known to conceal the pregnancy thus not benefiting from antenatal care (Treas, 2004:63).

Based on the statistics for death due to non-attendance, and infrequent attendance of antenatal care (NDoH, 2008:3), one could infer that similar statistics exist for mothers who do not report for antenatal care, thus not benefiting from antenatal education programmes where information on the importance of tactile stimulation during infancy and early childhood is shared, thus leading to a lack of knowledge about the importance of tactile stimulation.

2.3.6.3 *Teenage pregnancy*

A teenager by definition is a girl aged between 15 and 19 years of age (Berry & Hall, 2010:1). For the year 2009, the Marie Stopes reproductive health clinic in Cape Town reported having performed approximately 5000 termination of pregnancies on teenagers aged between 12 and 19 years, with the Western Cape Department of Health reporting the Cape Town and Tygerberg sub districts having the highest teenage pregnancy statistics for the same period (Maposa, 2010:7).

Teenage pregnancies in most cases are unplanned, resulting in late presentation for antenatal care and often being non-compliant with antenatal care attendance (Treas, 2004:63). The absence of antenatal care, subjects pregnant teenagers to an increased risk of conditions, such as hypertension disorders, preterm birth, and intra-uterine growth restriction (Treas, 2004:63), which in turn increases the infant's risk of being born with a low birth weight. The teenage mother, based on the risk for perinatal morbidities, her immaturity and limited knowledge, and reporting late for antenatal care and education (Treas, 2004:63), may potentially be ignorant of the importance of tactile stimulation during infancy and early childhood, thus predisposing her offspring to tactile deprivation. With these infants being at risk of weighing less than 2500 grams at birth (low birth weight), are at risk for insecure attachments, and susceptibility to physical, emotional and behavioural problems (Kokot, 2010:16).

Although adolescence is a period of sexual expression and experimentation (Taylor *et al.*, 2005:939), experimentation with teenage sex, could also be a symptom of teenagers having grown up with a lack of affective care during their formative years (Knight, 2010:4). Failure to provide postnatal support and resources to teenage

mothers regarding the importance of tactile stimulation during infancy (Cohen, 2009:4), may set a platform for trans-generational abuse and deprivation (Perry, 2001:5).

2.3.6.4 *Substance abuse*

The South African National Council on Alcohol and Substance Abuse (SANCA) reports that substance abuse has continued to flourish, causing havoc in families and communities in the WCP (SANCA, 2009:11).

The 2009 statistical report of the Cape Town Drug Counselling Centre (CTDCC) indicates that 17% of clients started using drugs before the age of thirteen, 70% in their teenage years (CTDCC, 2009:1). SANCA statistics for 2008 compared with 2007, revealed a 67% increase in the number of outpatient clients, a 5% increase in the number of female clients, and 45% of all clients being under the age of twenty-one years (SANCA, 2009:19).

Substance abuse not only has a detrimental effect on the abuser, but in the case of female abusers who fall pregnant and become mothers, the abuse disrupts the parenting process and interferes with the mother's ability to nurture her child's social and emotional development (Cohen, 2009:3).

Low birth weight infants due to their immature status, frequently require hospitalization which separates them from their mothers, thus increasing their risk of insecure mother-infant attachment, a setting that further predisposes them to risk taking behaviour such as substance abuse and sexual promiscuity later in life (Kokot, 2010:16).

With tactile deprivation during infancy being known to cause addictive behaviours (Knight, 2010:4), one needs to ask whether the statistics of substance abuse in the WCP is a symptom of children having been reared with a deficit of tactile stimulation during their formative years.

2.3.6.5 *Numeracy and literacy levels*

Healthy social-emotional development is a strong predictor of academic performance in primary school (Cohen, 2009:5). Studies done in 2002 show that 37% of grade three learners had numeracy levels equivalent or higher to grade three, while 32% had literacy levels equivalent to grade three (Casey, 2009:1). In 2003, an assessment of

the literacy of grade six learners in the WCP revealed a 35% literacy level. A repetition of the study in 2007 revealed an average literacy level of only 27.9% (Casey, 2009:1).

Every infant is born with a genetic capacity for optimal development (Perry, 2001:2). Brain growth (of which 80% takes place during the twenty one months post delivery) is dependent on the sensory stimulation that infants receive (Bergman, 2007:103), with a lack of tactile stimulation during the infancy period contributing to stunting of neural cell growth (Knight, 2010:1).

One could postulate that a possible factor, contributing to the lack of cognitive ability amongst school going children in the WCP (Casey 2009:1), could be the lack of tactile stimulation received during infancy and early childhood, thus highlighting the need to ensure that mothers receive the necessary knowledge about the importance of tactile stimulation during infancy and childhood. In order to justify this argument, further research is required to investigate a possible link between poor academic performance and tactile deficit during childhood.

2.3.6.6 *Crime and violence*

The statistics for murder, assault, rape and domestic violence are noticeably higher in the Cape Town Metropole region than the rest of the country, with homicide being the highest cause of death in most Western Cape districts. Health care facilities felt the brunt of the violence, with a spillage of violent activities into health care facilities in the Cape Town Metropole, and the WCP having the highest incidence of health care worker assaults (WCDoH, 2004:20). For the year 2007, the WCP had the highest incidence of youth crime, with the number of youth awaiting trial having increased from 6 558 in December 2005 to 8 800 in December 2007 (WCDoT, 2008:112).

Children, who are deprived of tactile stimulation and secure attachments during the early childhood period, often present with aggression, cruelty, poor impulse control and a lack of empathy (Perry, 2001:6). A lack of tactile stimulation during the early childhood development can lead to increased violence and self-mutilation (Knight, 2010:1). In cultures where touching is part of daily behaviour, low incidences of societal crime was observed (France: 1/100 000 population), compared with the high incidence

of societal violence in cultures showing a low affinity for touching (America: 22/100 000) (Field, 2004:x).

With the reported high crime rates (WCDoh, 2004:20; WCDoh, 2009:7), there is a need for research into a possible link with tactile deficit and juvenile crime in the Cape Town Metropole.

2.3.6.7 Surrogate parenting

Within the context of this study, surrogate parenting refers to a child who is raised or nurtured by someone other than its biological mother. Within the black communities in South Africa, many children are being raised by surrogate parents. This scenario often manifests in situations where teenage mothers return to school once the infant is born, or where migrant mothers work away from home (Coovadia, Jewkes, Barron, Sanders & McIntyre, 2009:823).

The absence of the biological mother to fend for the interests of her child often has major negative effects on the experiences of these children during infancy and childhood. Children in surrogate parent settings are often frequently moved between households, resulting in their emotional needs being neglected (Coovadia *et al.*, 2009:823). Emotional neglect, which may take the form of tactile deprivation, negatively impacts on the secure attachment, necessary for the development of a positive self concept (Taylor *et al.*, 2005:825).

Maternal deprivation contributes to hypersensitivity to touch, a condition where abnormally high electrical activity in the brain results in neurons becoming hypersensitive due to the lack of tactile stimulation. Some of the behaviours that individuals subjected to hypersensitivity to touch exhibit include violence, rejection and self-mutilation (Knight, 2010:2). Children, who are deprived of secure attachment relationships during their formative years, often find difficulty in making friends, trusting adults and tend to lack empathy (Perry, 2001:1).

Research studies attest to the fact that many children in South Africa find themselves in surrogate mothering settings (Coovadia *et al.*, 2009:823), where they may be subjected to the consequences of maternal deprivation (Knight, 2012:2) and insecure attachments (Taylor *et al.*, 2005:825). With many children growing up within a

surrogate parent setting (Coovadia *et al.*, 2009:823), there is a need to ensure that biological mothers as well as surrogate parents are made knowledgeable about the importance of tactile stimulation during infancy and the early childhood period.

2.3.7 Factors that influence the acquisition of patient information

2.3.7.1 Provision of patient education

Patient education can be described as a process whereby a health care worker strives to influence a patient's behaviour that would bring about a change in knowledge, skills and attitudes for optimal health (Taylor *et al.*, 2005:475).

When patients are provided with information and training, they are known to experience better health and have fewer complications (Taylor *et al.*, 2005:475). The provision of informational resources to caregivers play an important role in the social and emotional development of children during the early childhood development period (Cohen, 2009:4).

With the reported infrequent antenatal care and non attendance of antenatal clinic being an ongoing challenge in South Africa (NDoH, 2008:3), it could be postulated that many women in South Africa are not benefiting from the patient education strategies that are provided by perinatal health facilities.

2.3.7.2 Impact of service capacity on the therapeutic environment

In 1999, the number of live births within public health facilities in the WCP was documented as 70 549. In 2007, the number increased to 96 821 (NDoH, 2008:310). Despite the appointment of additional health care workers at MMH, and the opening of an additional twenty level one perinatal beds in 2007 at MMH (WCDoH, 2009:160), services have remained over-saturated, with facilities often not being able to cope with the demand for service delivery (WCDoH, 2009:164). The service pressures in perinatal and neonatal care have resulted in the total number of obstetric deliveries continuing to increase by 17% per annum (WCDoH, 2009:162). An additional challenge that perinatal services in the WCP are facing, includes a shortage of skilled midwives (WCDoH, 2009:161).

One of the roles of the nurse / midwife is to aid the patient in achieving or maintaining a level of optimal health and wellness (Bruce, Gagnon, Gendron, Puteris & Tambryn, 2007:23). A therapeutic environment is one that provides a sense of warmth, friendliness, openness, respect, empathy, care, education, competence and trust (Taylor *et al.*, 2005:456). Safeguarding the provision of a therapeutic patient environment contributes to patients achieving this state of health and wellness (Muller, 2005:200).

Perinatal services remain saturated with a shortage of human resources posing a challenge to the quality of patient care being provided (WCDOT, 2008:120). The low statistics of mothers who have opted to exclusively breastfeed for the first six months post delivery despite the aggressive patient education strategy via the baby Friendly Hospital Initiative (NDoH, 2011:1), could be indicative of service pressures having a negative impact on the therapeutic environment of patients especially on the provision of patient education.

2.3.7.3 *Knowledge and skills of health care workers in perinatal care*

The Fourth Saving Mothers Report in South Africa (NDoH, 2008:319) reveals a deficit in the knowledge and skills of perinatal health care workers, with substandard management of patients being the most common health care worker related problem in the WCP. A review of the National Perinatal Problem Identification Programme (PPIP) database for the period January 2006 to December 2008 (Pattison, 2009:51), substantiates these findings. Cohen (2009:5) reports that the lack of a skilled workforce often functions as a barrier to implementing effective patient care services. In order to ensure optimal infant and early childhood health and development, health authorities need to ensure that health care providers caring for mothers and infants generate the necessary competencies (Cohen, 2009:3).

2.4 Conceptual framework

A conceptual framework can be described as a systematic structure of meaning that provides the researcher with guidance in the development of a study. The conceptual framework can be tested in the study and enables the researcher to connect the findings to the body of knowledge in nursing (Burns & Grove, 2007:240).

Orem's self care theory (Bruce *et al.*, 2007:17), plays an integral role in the manner in which health care is provided to pregnant women. Maslow's theory displays the various hierarchical needs that individuals need to experience in order to function optimally (Maslow, 1943:388).

2.4.1. Orem's theory of self care

Orem's theory of self care is based on the belief that every person has a need for self care in order to enjoy optimal health (Bruce *et al.*, 2007:17). Self care is the ability to perform activities to meet one's personal needs in order to function holistically (Bruce *et al.*, 2007:18). The theory describes three support modalities that can be implemented to assist a patient in reaching a state of health and self-sufficiency.

The first modality, i.e. the *total compensatory modality*, can be applied to patients who are unable to do things for themselves. The nurse in this instance fulfils most, if not all, of the patient's needs such as bathing, feeding, elimination, provision of a safe environment. Secondly, the *partial compensatory support modality* involves a situation where the patient is able to perform some self care activities, but needs the input of the nurse for complementary activities for overall health and wellbeing.

With the third modality, known as the *educative/supportive compensatory modality*, the patient or client is able to meet most, to all of his / her self care needs, but requires assistance with issues, such as decision making, guidance, behavioural control and the acquisition of information and knowledge. The nurse in this instance fulfils a role of consultant, educator and advocate (Bruce *et al.*, 2007:23, 24).

The majority of pregnant women, receive antenatal care on an outpatient basis and are therefore able to fulfil most of their self care needs (Bruce *et al.*, 2007:23). The care modality, applicable during pregnancy, is therefore predominantly the provision of the educative/supportive compensatory modality, which includes aiding in decision making, guidance, behavioural control, and the provision of information and knowledge (Bruce *et al.*, 2007:24).

During the labour and delivery period and the immediate postnatal period, the self care needs of a woman increases and she thus moves into a phase where the partial compensatory support modality becomes operational (Bruce *et al.*, 2007:23). As she

recovers from the birthing experience, most women again enter the phase where the educative/supportive compensatory modality (Bruce *et al.*, 2007:24) becomes operational.

2.4.2 Maslow's hierarchy of needs theory

Maslow's needs hierarchy theory refers to specific needs in man that follow a hierarchical flow, with one need manifesting after the previous having been satisfied (Maslow, 1943: 370). The first need in the hierarchical structure is that of physiological needs i.e. an individual's basic need for homeostasis. Homeostasis refers to the body's effort to maintain a state of physiological functioning and equilibrium. At any given time in an individual's existence, the need to have the physiological needs fulfilled often supersedes that of all the other needs (Maslow, 1943:372). The second need is the need for safety. Once an individual's homeostatic and safety needs have been fulfilled, the need for love and belonging will manifest. The manifestation is seen in the need to generate relationships with people or for the individual to find its place in a specific group (Maslow, 1943:381). Most people have a desire to be valued and esteemed by others. The manifestation of the esteem needs is seen in the desire to achieve, to be recognised and be appreciated. Satisfaction of the esteem need generates feelings of self-confidence, with a lack thereof resulting in feelings of inferiority, weakness and helplessness which in turn may result in neurotic trends (Maslow, 1943:383). The process to the point of self-actualization is not a rigid one, and does not take place in a fixed order (Maslow, 1943:388).

Infants are birthed into this world in a state of immaturity (Bergman, 2007:9), with a need for their physical and physiological needs to be met (Fraser & Cooper, 2005:709). Mothers and primary caregivers play an important role in providing an environment that feeds into the provision of an infant's physical and physiological needs for the maintenance of homeostasis (Fraser & Cooper, 2005:727). The implementation of tactile stimulation during the newborn period contributes to the physiological needs of temperature regulation, weight gain, cardio-pulmonary stabilisation (Blackwell & Cattaneo, 2007:2) and brain cell organisation (Bergman, 2007:7).

When an infant is separated from its mother for prolonged periods, the phenomenon of "protest-despair" occurs – a setting that places the infant in a stress / survival mode which physiologically speaks of being in an unsafe environment (Bergman, 2007:235).

Holding, massage, and stroking results in the establishment of the secure bonding relationship between a mother and her infant (Klaus *et al.*, 2004:110), thus feeding positively into the need for safety and security.

The love need that Maslow attests to is seen in the implementation of skin to skin contact in the post delivery period which generates the release of the hormone oxytocin and enhances a mother's feeling of well being and interaction with her infant (Field, 2004:196). Infants who receive physical affection and love from their mothers during their formative years, cope better with stress and anxiety during adulthood, have better social skills, feel secure in relationships and cope better with difficulties in life (Derbyshire, 2010:25).

Although the generation of a positive self esteem appears higher on Maslow's hierarchical structure of needs (Taylor *et al.*, 2005:28), if the needs to belong and be loved are poorly addressed during infancy and early childhood, it contributes to the generation of a poor self esteem later in an individual's life (Maslow, 1943:383). The generation of a poor self esteem in turn impacts on the overall release of potential in the individual, thus negatively impacting the self actualisation level of the person (Maslow, 1943:383).

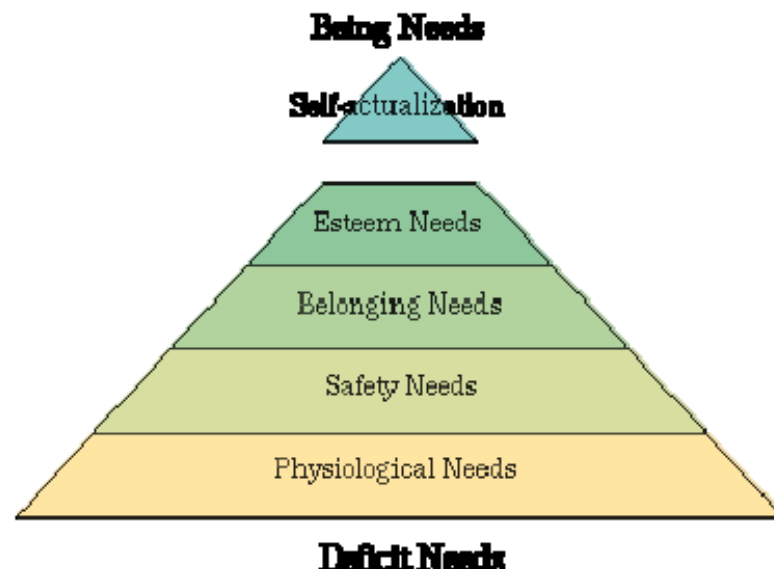


Figure 2.1 Maslow's hierarchy of needs (Boeree, 2006:1)

2.5 Conclusion

Chapter 2 presents the findings from the literature review, producing scientific knowledge regarding the benefits of tactile stimulation and the detrimental effects that tactile deprivation could have on infants and children, as well as later in adult life. The studies reviewed show that an association exists between tactile deprivation and societal pathologies, such as crime, violence, lowered literacy levels and teenage pregnancies.

The findings also reveal that perinatal services in the Cape Town Metropole region, are experiencing ongoing service pressures due to an increased influx of patients from neighbouring provinces and countries. Limited human resources and under skilled health care workers are factors impacting on the quality of patient care. The absence of a therapeutic environment could result in mothers, passing through perinatal facilities, without receiving adequate patient education on matters pertaining to tactile stimulation or receiving patient education but not implementing it. The Department of Health has aligned itself to many programmes that aim at aiding child survival and reducing the rates of morbidity and mortality among infants and young children. The question to be asked is whether the benefits of these strategies are being sabotaged by service pressures.

Community education to improve neonatal health has been identified as one of the ten key recommendations in the Saving Mother's Report of 2005 - 2007 (NDoH, 2008:45). It is therefore imperative for the strengthening of community infrastructure and community "buy-in" to successfully inform and educate communities about matters, such as the importance of tactile stimulation during infancy and early childhood.

What is not known is whether first time mothers in the Cape Town Metropole region possess adequate knowledge about the importance of tactile stimulation during infancy and the early childhood development phases, and about the negative impact that a lack of tactile stimulation could have on the lives of an infant and young child.

The literature review did not reveal any published or unpublished data regarding the existing knowledge that first time mothers have about the importance of tactile stimulation during infancy and early childhood.

Chapter 3 presents the methodology being applied to investigate the existing knowledge of first time mothers regarding the importance of tactile stimulation during infancy and the early childhood period.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology refers to the manner in which the research study was carried out and provides detail that would enable the replication of the study (Brink, van der Walt & van Rensburg, 2012:199). This chapter provides a detailed description of the methodology applied in this study, and describes the ethical considerations pertinent to the undertaking of the study.

3.2 Research question

A research question can be described as a succinct, interrogative statement that has been developed to give direction to a study (Burns & Grove, 2007:553). The focus of a research question also aids in examining the relationships between variables. In quantitative studies, the research question is normally concise and inclusive of the study variables and the population being studied (Burns & Grove, 2007:115).

The research question explored during this study was: *"Are first time mothers, attending Mowbray Maternity Hospital in the Cape Town Metropole, knowledgeable about the importance of tactile stimulation during infancy and early childhood?"*

3.3 Research aim

The aim of this study was to explore the level of knowledge of first time mothers attending Mowbray Maternity Hospital (MMH), regarding the importance of tactile stimulation during infancy and the early childhood development period.

3.4 Research objectives

Research objectives are clear and concise statements that give direction to a study and aim at identifying and describing the variables and the relationships between variables (Burns & Grove, 2007:553). The research methodology used in this study facilitated the attainment of the research objectives.

The specific objectives of the study were to:

- (a) Establish the existing level of knowledge of first time mothers about tactile stimulation strategies during infancy and early childhood,
- (b) Determine the existing level of knowledge of first time mothers regarding the impact of tactile stimulation and tactile deprivation on the bonding relationship, and the emotional, physical, and social domains of infants,
- (c) Ascertain whether information about tactile stimulation is being provided by health care workers, and
- (d) Identify recommendations, as proposed by the study participants, towards strengthening knowledge about the importance of tactile stimulation during infancy and early childhood at both the parental and healthcare provide levels.

3.5 Research methodology

The research methodology is described under the following subsections, i.e. research design, population and sampling, data collection tool, pilot test, validity and reliability, data collection, data management and analysis, and ethical considerations.

3.5.1 Research design

A research design can be described as a plan of how one intends to conduct a research study (Mouton, 2006:55).

During this study, a descriptive, non-experimental research design, using a primarily quantitative approach, was employed. Descriptive research refers to research that is conducted to discover new meaning, to describe what exists, to determine the frequency with which something occurs, and to categorise information (Burns & Grove, 2007:537). Descriptive research explores and describes trends in real life situations, by providing an accurate account of the characteristics of the individuals taking part in the study (Burns & Grove, 2007:24). The outcomes of descriptive research studies help to describe concepts, to identify relationships, and to develop hypotheses that provide a basis for future, quantitative research (Burns & Grove, 2007:25).

Quantitative research focuses on measurable aspects of human behaviour (Brink *et al.*, 2012:10) and involves the use of a formal process that objectively describes variables,

tests the relationships between them, and examines the cause and effect interactions among them (Burns & Grove, 2007:551). Although the study was primarily quantitative in nature, an open ended question was included in the questionnaire to gain an understanding of mothers' experiences regarding the care and patient education that was provided, and to use their input towards possible improvements. According to Culp and Pilat (1998:3), qualitative data can be quantified to strengthen a study. The qualitative data obtained was therefore thematically analysed and presented in a quantitative format.

With no previous studies having reported on the existing level of knowledge of first time mothers regarding the importance of tactile stimulation during infancy and early childhood, as discussed in chapter 2, the employment of the descriptive design enabled the exploration of the real life experiences and perspectives of first time mothers, in order to determine their understanding of the importance of tactile stimulation during infancy and early childhood.

With the conceptual framework (see section 2.4) incorporating the theories self care and Maslow's hierarchy of needs, the research design employed facilitated the discovery of new understanding and the provision of a basis for future research, regarding the importance of ensuring that first time mothers are equipped with the necessary knowledge about the importance of tactile stimulation during infancy and early childhood.

3.5.2 Population and sampling

This section describes the criteria of the study population and of the sample included in this study.

3.5.2.1 Study population

Population refers to all individuals, objects, or substances that are included in a research study, due to them meeting certain criteria (Brink *et al.*, 2012:56). The population, for the purpose of this study, included first time mothers, who attended the antenatal clinic and who were scheduled to deliver at MMH during the month of December 2008.

MMH was selected for this study, as it provides a range of various levels of perinatal care. The hospital predominantly functions as a secondary referral hospital to three Midwife Obstetric Units, situated in the Cape Town Metro West area (previously known as the Peninsula Maternal and Neonatal Service). The hospital also provides a level one perinatal service to the community residing in the immediate geographical area of Mowbray and surrounding residential areas. Besides these services being offered, MMH is also unique in that it has a semi-private perinatal unit, providing a level one service to low risk pregnant women. This setting thus provides a mixture of patients, representing various geographical areas in the Cape Town Metropole district, rather than only a specific geographical area, as well as a mixture of patients from diverse socio-economic backgrounds.

3.5.2.2 *Inclusion criteria*

Inclusion criteria refers to specific features that a participant must have in order to be part of the target population (Burns & Grove, 2007:325). For this study, first time mothers were sampled, who matched the following inclusion criteria:

- (a) Aged between 18 and 25 years,
- (b) Expected delivery date between the 1^s and 31st of December 2008,
- (c) Delivered a live infant (infants in the case of multiple births), and
- (d) Was admitted to a postnatal ward (from days one to ten post delivery).

3.5.2.3 *Exclusion criteria*

Exclusion criteria refer certain elements that would guide a researcher in excluding individuals or objects from the target population (Brink *et al.*, 2012: 131). For this study, first time mothers were excluded who:

- (a) Had a perinatal loss (miscarriage, stillbirth, neonatal death),
- (b) Had given their infant(s) up for adoption, and
- (c) Were more than ten days post delivery.

3.5.2.4 Study sample

A sample is defined as a fraction of a whole of a larger set as a part or fraction of a whole, or subset of a larger set, selected by the researcher to participate in a research study (Brink *et al.*, 2012:132). For this study, a systematic random sampling technique was used in the selection of participants.

Random sampling ensures representativeness of the population being studied. It also reduces any bias and allows the researcher to use inferential statistics. For random sampling to take place, a random list must be compiled of all the members in the population. Subjects are then randomly selected from this list (Brink, van der Walt & van Rensburg, 2012:137).

During the first half of 2008, an initial assessment of the delivery register reflected that the average number of first time mothers, delivering at MMH, was 350 per month. During September 2008, the folders in the antenatal clinic were examined and a sample frame was compiled of first time mothers, who matched the inclusion criteria. The PI constructed a random list with the names of all the participants meeting the inclusion criteria (N=101).

Ideally, all of the eligible participants (N=101) should have been included in the study sample. However, total population sampling, or an extended data collection period was not feasible, due to the restricted resources and available time of the PI. In consultation with a statistician from Stellenbosch University, Prof Martin Kidd, it was determined that, for the purpose of this study, a random sample of at least 41 (40.6%) would be sufficient for data analysis and for controlling sampling errors. From the random numbered list, each second number was selected by the PI. Accordingly, a systematic random sample of 50 (49.5%) was drawn from the study population (N=101). The strategy of random sampling was adhered to, as it increased the representativeness of the target population (Burns & Grove, 2007:551).

The PI arranged with the midwives in the antenatal clinic for the written informed consent to be obtained from the selected participants (n=50) when they reported for antenatal care. Due to the workload in the antenatal clinic, it did not happen. Consequently, the PI approached the participants on their admission to the postnatal

ward, and obtained written consent prior to the completion of the structured questionnaires during the face-to-face interviews.

Out of the selected participants (n=50), nine did not participate, due to them either delivering before (n=5), or after (n=1) the data collection period, or due to one having been transferred to another maternity hospital prior to the data collection period (n=1), or due to the unavailability of a translator (n=1), or because the patient was not found (n=1). Consequently, a statistically representative sample of 41 (40.6%) was drawn from the study population (N=101) in accordance with the calculation of the statistician.

3.5.3 Data collection tool

Due to the broad spectrum of information that can be collected from participants (demographic data, knowledge, beliefs, and opinions), questionnaires are often used in descriptive studies (Burns & Grove, 2007:382). When a researcher aims to explore what people think, believe or know, then posing direct questions is the most efficient method of gaining such information (Brink *et al.*, 2012:152).

Due to the study aiming at ascertaining the existing knowledge of first time mothers, a structured interview questionnaire was chosen for data collection. Accordingly, the PI developed a questionnaire (Appendix A), underpinned by the findings from the literature review, coupled with recommendations from an expert in the field of tactile stimulation (Dr Nils Bergman, Independent Public Health Physician), and with guidance from a nursing researcher (Dr Frederick Marais, Stellenbosch University) and a statistician (Prof Kidd, Stellenbosch University). Subsequently, the questionnaire was pilot tested, as described in section 3.5.4.

The structured questionnaire mainly comprised closed ended questions and one open ended question. The questionnaire was divided into two sections (Parts A and B). Part A collected the demographic data, including the participant's age, ethnicity, relationship status, main spoken language, residential area, schooling completed, ability to read, employment status, mode of delivery, birth weight, gavidity and parity, pregnancy planning and primary caregiver for the first four months post delivery .

Part B comprised thirty-one closed questions and one open ended question. This section covered participant knowledge about the importance of tactile stimulation and

the effects of tactile deprivation, and was subdivided into five key domains: bonding relationship, emotional impact, physical impact, social impact, and information on awareness and training. The open ended question was incorporated to allow mothers an opportunity to voice their opinions regarding the care and training that had been provided during their stay at the hospital, and to offer any additional comments and/or recommendations. The questionnaire was printed in English as all the interviews were planned to be conducted by the PI. In cases where language barriers arose, multi-lingual healthcare workers from MMH provided assistance; this was required in two cases.

The interview questionnaire was also used for the many other advantages attached to it, such as participants not having to read and write, the fact that all segments of a population could be targeted, the response and retention being high, the fact that non-verbal mannerisms can be observed, and questions may be clarified if misunderstood (Brink, *et al.*, 2012:153).

3.5.4 Pilot test

A pilot study also known as a preliminary study, is a small scale study, which is conducted before the main study on a limited number of participants from the same population, as that intended for the actual project (Brink, van der Walt & van Rensburg, 2012:174). A pilot study assists with the development and refinement of the research methodology (Burns & Grove, 2007:549).

In this study, the pilot was completed to test and refine, where necessary, the methodology (including the questionnaire and method of data analysis), and to test the interview questions for any ambiguity and inaccuracies.

A group of seven participants, representing 17% of the size of the actual study sample (n=41), was randomly selected for the pilot test. These participants were first time mothers, attending the antenatal clinic at MMH, whose expected dates of delivery fell within the last two weeks of November 2008.

The outcomes of the pilot test revealed no problems with the overall research methodology. The findings confirmed the clarity, content and ease of administration of the questionnaire. The data being yielded from the pilot study was analysed by the

statistician, Prof Kidd (Stellenbosch University), who confirmed the validity of the questionnaire and the method of analysis. The pilot test participants and data were subsequently excluded from the main study.

While conducting the pilot test, the PI became aware of the need to allow the mother an opportunity to recover from the delivery experience and to bond with her infant, before subjecting her to the interviewing process. The researcher had taken cognisance of this observation and as a result planned to conduct the main interviews at a later stage within the postnatal period. In the case of mothers who had vaginal deliveries, the interviews took place 12 hours post delivery, and for mothers who had caesarean section deliveries, the interviews were conducted two days post operatively.

3.5.5 Validity and reliability

Both validity and reliability are measured on a continuum, reflecting the degree of reliability and validity, rather than their presence or absence (Burns & Grove, 2007:365).

Validity refers to how well the data collection tool reflects the subject, or concept being examined. (Brink *et al.*, 2012:166).

Face validity is the extent to which the instrument appears to be valid to a participant in the study (de Vos, Strydom, Fouche, Delport, 2007:161). The structured interview questionnaire was tested for face validity by means of the pilot test, as described above (section 3.5.4).

The content validity of an instrument refers to the representativeness of all variables being measured in the study (de Vos *et al.*, 2007:161). Content validity, including the appropriateness of the key domains and variables being used in the questionnaire, were ensured through the findings from the literature and by the evaluative inputs from experts in the fields of tactile stimulation (Dr Nils Bergman, Independent Public Health Physician) and in research methodology (Dr Marais, Stellenbosch University). Subsequently, the questionnaire was reviewed by the statistician from Stellenbosch University (Prof Kidd) to ensure that the data yielded, would be suitable for the required data analysis method.

Reliability refers to the consistency in which the information being gathered is measured (Burns & Grove, 2007:552). Reliability of the questionnaire was enhanced by means of the pilot test that had ensured complete and consistent capturing of the required data, and by the PI collecting all the data, using the structured, interview questionnaire, within a specified one-month period. In addition, based on the data yielded from the pilot test, the statistician evaluated and confirmed the statistical feasibility of the questionnaire and the method of data analysis. The written data was captured electronically and validated for completeness and accuracy by the PI.

3.5.6 Data collection

Data collection is the precise, systematic gathering of information, relevant to the research purposes, or the specific objectives, questions, or hypotheses of a study (Burns & Grove, 2007:536).

The use of a face-to-face, interview, rather than a self-completion questionnaire was chosen, due to the data collection being scheduled for the immediate postnatal period, a time of major adjustment to the new role of motherhood and to the physiological processes taking place. These adjustments may include the new responsibilities of caring for and bonding with another human being, experiencing abdominal pains from uterine contractions that vary in intensity, edema or discomfort of the perineal area due to a vaginal birth, post-operative pain in the case of mothers having had a caesarean section birth, and adapting to the breastfeeding experience (Treas, 2004:135). For many new mothers, this is an emotionally, overwhelming period. The PI was of the opinion that a structured interview questionnaire would be preferable, as these factors could have contributed to respondents not viewing the self completion of the questionnaire as a priority.

In the clinical areas, where the participants were expected to pass through or stay, whilst in hospital (antenatal clinic, labour wards, obstetric theatre and postnatal wards), the PI briefed the midwives on their roles with regards to the study. Midwives in the antenatal clinic agreed that they would be able to obtain the required informed consent from the sampled participants. A Participant Information Form (Appendix F) and Consent Form (Appendix E) were placed in the folders of the respective participants. Besides the information sessions that had been held in the various clinical areas, multi-

colour, patient information posters (Appendix G) were also placed in the various clinical areas, in order to inform patients about the proposed study.

During the data collection period of one month (1st to 31st December 2008), the PI did rounds twice a day (morning and late afternoon) in the labour wards and in the various postnatal areas, to identify any of the randomly selected participants.

At the commencement of the data collection period, the PI discovered that due to the excessive workload in the antenatal clinic, the midwives were not able to complete the Consent Forms (Appendix E), as per prior arrangement. Informed consent was however obtained from the participants prior to conducting the face- to- face interviews. All data was collected by the PI at the bedside of the participant. To ensure privacy and confidentiality, the curtains were drawn and the PI posed the questions so that they were not audible to fellow patients. Most interviews lasted an average of ten to fifteen minutes.

In respect for the participants' autonomy, data collection took place once the mother had settled down in the postnatal ward. In the case of participants who had vaginal deliveries (n=19), the interviews were conducted twelve hours post delivery, or a few hours prior to discharge. In the case of participants who had had caesarean section deliveries (n=22), the interviews were conducted on either the second or the third day post delivery.

3.5.7 Data management and analysis

Data analysis is the technique used to reduce, organise, and give meaning to data (Burns & Grove, 2007:536). The PI captured the quantitative data yielded from the interview questionnaires onto Microsoft Excel (Office 2010), and verified and validated it for accuracy. Data quality was assured through cross checking that data had been capturing correctly, by comparing the completed questionnaires with the electronic dataset. Following the completion of the electronic data entry, all data was again validated by the PI. Subsequently, the data was analysed statistically, using Statistica Version 10 software, with the assistance of the statistician from Stellenbosch University, Prof Kidd.

As the study was primarily descriptive in nature, the data analysis focused predominantly on descriptive statistics, including frequency tables, proportions, and means, as discussed in chapter 4. Where indicated, the chi-square (χ^2), Mann Whitney, Spearman and Fisher LSD tests were utilised to determine the measures of relationships between various variables. A 5% ($p \leq 0.05$) significance level was used as a guideline for determining statistically significant relationships.

A thematic approach (Culp & Pilat, 1998:3) was used to analyse the qualitative data obtained in response to the open ended question. The participants' responses were grouped into identified categories, resulting in the identification of nine descriptors, which were further grouped into the following five themes: antenatal care, adequate care, staff attitude, postnatal care and professionalism. Subsequently, in order to strengthen the findings of the study, these qualitative themes were quantified, based on the approach developed by Culp and Pilat (1998:3), by using descriptive statistics.

The results and findings of the study are presented in chapter 4.

3.5.8 Ethical considerations

Ethical approval for the study was obtained from the Committee for Human Research, Faculty of Health Sciences, Stellenbosch University (Appendix B). In addition, operational approval was obtained from the Western Cape Province Department of Health (Appendix C); and from the medical superintendent, nursing manager and Research Committee of MMH (Appendix D).

Written informed consent was also obtained from each participant (Appendix E). Several measures were taken to ensure confidentiality and anonymity. The PI undertook all the data collection on a face-to-face basis. The questionnaires were coded and no personal identifying information was collected, whilst the Consent Forms (Appendix E) were completed and stored separately from the questionnaires. Where translation was required, multilingual nursing staff from MMH assisted to prevent any bias and to maintain confidentiality and data validity. A translator was required during two interviews. Only the PI had access to the completed questionnaires, which were stored in a locked cabinet at her workplace. Data will be kept for a period of five years.

In addition, the main ethical principles that govern all biomedical research studies, i.e. beneficence, respect for human dignity and justice, as discussed below, were adhered to during the study (Burkhardt & Nathaniel, 2002:237).

3.5.8.1 *Beneficence*

Beneficence refers to the right to be protected from harm and discomfort, as well as to find a balance between the benefits and the risks of a study. The premise of this principle is that one should refrain from causing any harm, whether physical, mental, emotional, spiritual, economic, or social. Beneficence also includes discomfort, such as fatigue, physical pain, anxiety and embarrassment (Burkhardt & Nathaniel, 2002:237).

As explained above (section 3.5.4), while conducting the pilot test, the researcher took cognisance of the fact that mothers had been fatigued during the immediate post delivery period and therefore planned to rather conduct the interviews later within the postnatal period. In the case of participants having an emotional breakdown, the plan of action was to refer the participant to the resident social worker for counselling and support; this was not required.

3.5.8.2 *Respect for human dignity*

Respect for human dignity refers to the autonomy that a potential participant has, and therefore the right to choose whether he/she would like to participate in the research study, as well as the right to withdraw from the study at any time, without any negative consequences with regards to the subsequent care being rendered (Burkhardt & Nathaniel, 2002:239). Participation should therefore be voluntary and free from coercion (threatening to harm or to penalise for non-participation and/or offering excessive rewards for participation). Potential participants should also be fully informed about the anticipated risks, benefits and time constraints associated with the study (Burkhardt & Nathaniel, 2002:239).

In an information session, prior to conducting the interview, each participant was individually invited to participate and was informed about the reasons for the study. Participants were also informed that ethical permission had been obtained to conduct the study and that all shared information would be kept confidential. Participants were

further ensured that they had the right to refuse to participate and that the study would carry no risks, and that future mothers would benefit from the outcome of the study.

3.5.8.3 *Justice*

The principle of justice includes the right to privacy, maintaining anonymity and confidentiality, and the right to fair treatment (Burkhardt & Nathaniel, 2002:236).

The right to privacy was adhered to by ensuring that the interviews took place in private and that they were conducted at a tone that was not audible to fellow patients. All records pertaining to the study was kept in a secured area, with no other persons having access to the information.

To conform to the ethical principles of confidentiality and anonymity, questionnaires were coded, with no identifiable patient information being reflected on the questionnaires.

3.5.8.4 *Informed consent*

Informed consent ensures that the potential participant understands the information being shared and has a chance to clarify any misunderstandings, or to request any further information (Burkhardt & Nathaniel, 2002:240).

Written informed consent was obtained prior to conducting the interviews. All participants were provided with an information leaflet (Appendix F) that explained the nature of the study. Where participants were unable to converse in either English or Afrikaans, nurses from MMH were asked to assist with the translation, in order to maintain confidentiality and anonymity and to prevent any bias.

Participants were assured that they had the right to refuse to participate, or to withdraw at any stage during the interview and that this refusal would not negatively affect the further care that they would receive.

3.6 Conclusion

Chapter 3 presented an in-depth account of the methodology being applied in the study. Due to no previous studies having been done to ascertain first time mothers' knowledge about the importance of tactile stimulation during infancy and early childhood, a descriptive design was chosen, with the aim of generating an accurate account of participants' existing levels of knowledge.

Systematic random sampling was chosen to ensure representativeness of the population being studied and also to reduce any sample bias. A random sample of 50 (49.5%) was drawn from the study population (N=101). Due to various unforeseen factors, the sample size decreased to 41 (40.6%). A pilot test, comprising seven participants, was undertaken to test and refine, where necessary, the methodology and the interview questions for any ambiguities and inaccuracies. These seven participants were excluded from the main study. Each participant made an informed decision to participate in the study and gave prior, written consent to be interviewed.

All data was collected by the PI by means of a face-to-face interview using a structured questionnaire. The PI captured the collected data into Microsoft Excel (Office 2010) and validated the accuracy of the data being captured. With the assistance from a statistician, the quantitative data was analysed, using Statistica Version 10 software. The one open ended question had yielded qualitative data, which was thematically analysed and converted into quantitative statistics, based on the approach developed by Culp and Pilat (1998:3). This chapter also included a discussion of the ethical issues relating to this research that were incorporated prior to, during, and following the study.

The study results are presented, interpreted, and discussed in chapter 4.

CHAPTER 4

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

Chapter 4 presents, interprets, and discusses the results of the analysed data. As the study was quantitative in nature, the analysis of the statistics was descriptive. The results are presented in the form of frequency tables, proportions and measures of relationships. A p-value of ≤ 0.05 was used to indicate statistically significant associations between variables. In order to strengthen the findings of the study, a thematic approach (Culp & Pilat, 1998:3) was used to analyse the qualitative data generated from the responses to the open-ended question. The latter data was converted and quantified into quantitative statistics, in accordance with the approach developed by Culp and Pilat (1998:3).

4.2 Presentation and discussion of the study findings

The aim of this study was to explore the existing knowledge of first time mothers about the importance of tactile stimulation during infancy and the early childhood development period.

The outcomes of the study are consecutively presented and discussed under the following headings: demographic data; knowledge of tactile stimulation strategies and their impact on the bonding, emotional, physical, and social domains; patient training and awareness; and emerging themes identified from the open-ended question.

As described in chapter 3, where applicable, the chi-square (χ^2), Mann Whitney, Spearman, and Fisher LSD tests were utilised to determine the measures of any relationships between the variables. Overall, across most of the variables, no statistically significant differences were observed ($p \geq 0.05$) when cross tabulated against age, ethnicity, relationship status, residential area, and employment status; apart from those ones specifically reported in the text. Results are reported only for that data that was found to be statistically significant ($p \leq 0.05$).

4.3 Demographic data

The demographic data that was collected for the purpose of this study included age, ethnicity, relationship status, main spoken language, residential area, schooling completed, ability to read, and employment status, mode of delivery, birth weight, gravidity and parity, pregnancy planning, primary caregiver for first four months. The data is summarised in table 4.1, with the discussions following thereafter.

Table 4.1: Summary of the demographic data of participants

Variable	n=41	100%
Age		
18 years	2	4.9
19 years	2	4.9
20 years	2	4.9
21 years	4	9.8
22 years	6	14.6
23 years	10	24.4
24 years	6	14.6
25 years	9	21.9
Ethnicity		
Coloured	21	51.2
African	12	29.3
Other ethnic groups	6	14.6
White	1	2.4
Indian	1	2.4
Relationship status		
Married	29	70.7
Permanent partner	11	26.8
No partner	1	2.4
Main spoken language		
English	19	46.3
Xhosa	12	29.3
Other	7	17.1
Afrikaans	3	7.3
Residential area		
Other	15	36.6
- Outside of drainage area	8	-
- Adjacent to Mowbray	7	-
Mitchell's Plain	9	22.0
Mowbray	8	19.5
Guguletu	7	17.0

Khayelitsha	2	4.9
Schooling completed		
Grade 12	19	46.3
Tertiary busy / Completed	11	26.9
Grade 8 - 11	10	24.4
Grade 1 - 7	1	2.4
Ability to read		
English and Afrikaans	21	51.2
English and Xhosa	8	19.6
English and Other	7	17.1
English, Afrikaans and Xhosa	3	7.3
English only	1	2.4
Not mentioned	1	2.4
Employment status		
Unemployed	19	46.3
Employed	15	36.6
Housewife	4	9.8
Scholar	3	7.3
Mode of delivery		
Caesarean section	22	53.7
Vaginal delivery	19	46.3
Birth weight		
> 2500 grams	40	97.6
< 2500 grams	1	2.4
Gravidity and parity		
Primigravida	32	78.1
Gravida 2 Parity 0	6	14.6
Gravida 3 Parity 0	3	7.3
Pregnancy planning		
Pregnancy unplanned	22	53.7
Pregnancy planned	19	46.3
Primary caregiver for first four months		
Self	25	60.9
Grandmother	9	22.0
Caregiver – non-family member	7	17.0

4.3.1 Age

The ages of the participants in the study ranged from 18 to 25 years. The mean age of the study participants was 23 years, with the mean age of the two dominant ethnic groups being 22.5 years for the Coloured participants, and 22.5 years for the African participants. This age range was similar to that of first time mothers who delivered at MMH (MMH, 2008:n.p.).

The age of eighteen (18) was chosen as the lower level of the range, as this is considered to be the age when children reach a state of majority in South Africa (Govender & Masango, 2007:1). The age of twenty-five (25) years was chosen as the upper limit of the range, as it is considered the age at which women would normally start a family (Taylor *et al.*, 2005:380).

The mean age of the study participants of 23 years was similar to the reported mean age of 24 years of first time mothers in South Africa (Armoateng, 2004:35). A comparison of the mean ages of first time mothers among the various race groups in South Africa showed that Coloured and African women entered motherhood at a mean age of 22 years, with 32% of them having had their first infant by the age of 20 years, while 14% of Asian and White girls, having had their first infants at the age of 20 years (Armoateng, 2004:10).

4.3.2 Ethnicity

The majority (51.2%, n=21) of the participants were Coloured, followed by African (29.2%, n=12), other ethnic groups (14.6%, n=6), Whites (2.4%, n=1) and Indian (2.4%, n=1). This ethnic distribution was congruent with the demographics for the WCP, which is home to most of South Africa's Coloured population (Punt *et al.*, 2005:2).

Participants being categorised as "other ethnic groups" included women from Zimbabwe (n=3), Malawi (n=1), Lesotho (n=1), and the Democratic Republic of the Congo (n=1). The purpose for the inclusion of the ethnicity of participants was to determine the number of mothers passing through the facility, who were of ethnic groups other than those commonly residing in the WCP (African, Coloured, Indian and White).

4.3.3 Relationship status

The majority (70.7%, n=29) of participants reported being married, followed by those having a permanent partner (26.8%, n=11). One participant reported not having a partner at the time of giving birth. Of the participants who reported being married (n=29), 27.6% (n=8) indicated that their marriages had taken place as a result of their pregnancies. Although most South Africans view marriage as the event that initiates the formation of a family (Amoateng, 2004:8), marriage in South Africa (as was confirmed by the findings of this study), is often linked to pregnancy, childbearing (Statistics SA, 2010:2).

4.3.4 Main spoken language

Almost half (46.3%, n=19) of the participants reported English as being their main spoken language, 29.3% (n=12) Xhosa, and 7.3% (n=3) Afrikaans. A further 17.1% (n=7) reported their main spoken languages as being other than English, Xhosa or Afrikaans, including Ndebele (n=1), Chewa (n=1), Sotho (n=1), Shona (n=2), Bangla (n=1) and French (n=1). Of these seven participants, six were able to speak English. The French speaking participant reported not being able to speak English at all.

Although only one participant indicated French as her mother tongue, staff at MMH reports an increase in the number of French speaking women passing through the facility (Keck, 2009:n.p.). The Annual Performance Plan for the Western Cape (WCDoH, 2009:164) acknowledges the ongoing migration of individuals from countries on the African continent to the WCP. Health reports have substantiated the increase in the number of foreign national women frequenting maternity facilities in the WCP (WCDoH, 2009:161).

4.3.5 Residential area

Twenty-two percent (n=9) of the participants resided in Mitchell's Plain, 19.5% (n=8) in Mowbray, 17.0% (n=7) in Guguletu, and 4.8% (n=2) in Khayelitsha. These residential areas reflected the various drainage areas for MMH (MRC, 2005:89).

More than a third (36.6 %, n=15) of the participants were from other residential areas, of which 46.6% (n=7) lived in areas adjoining Mowbray, while 53.3% (n=8) were from

areas outside of the MMH drainage area. This residential pattern was in keeping with that of the various drainage areas for MMH (MMH, 2008:n.p.).

One reason for the high percentage of participants who were from other residential areas could be attributed to the influx of other ethnic groups, not having access to medical aid schemes that made use of MMH (Riekert, 2008 n.p.).

4.3.6 Schooling completed

Nearly half (46.3%, n=19) of the participants had completed their secondary schooling, with 26.8% (n=11) having either completed, or were in the process of completing some form of tertiary education. Ten participants (24.4%) reported scholastic achievements ranging between grades eight and eleven, while one participant reported a schooling leaving certificate below grade seven.

4.3.7 Ability to read

Of the 41 participants, 51.2% (n=21) were able to read English and Afrikaans; 19.5% (n=8) English and Xhosa; 17.1 % (n=7) English and another language other than Afrikaans and Xhosa; 7.3% (n=3) English, Afrikaans and Xhosa; with one participant being able to read English only. Another participant did not provide information regarding her literacy.

4.3.8 Employment status

A large proportion (46.3%, n=19) of the participants reported being unemployed, followed by employed (36.6%, n=15), being housewives (9.8%, n=4), or at school (7.3%, n=3).

Based on area of residence, participants from Guguletu reported the highest percentage of unemployment (85.7%, n=6), followed by Mowbray (75%, n=6), Khayelitsha (50%, n=1), those living in "other areas" (26.6%, n=4), and Mitchell's Plain (22.2%, n=2).

Twenty-seven percent of people residing in the WCP are known to be unemployed, with the city centre having higher rates of unemployment than the rural areas (Punt *et al.*, 2005:16). Three of the Midwife Obstetric Units referring to MMH fall within the sub-

districts, reported to having the highest unemployment rates in the Cape Town Metropole region, with Khayelitsha having an unemployment rate of 47%, Klipfontein 36%, and Mitchell's Plain 33% (WCDoH, 2004:13).

Unemployment and poverty create conditions for limited schooling, poorer health care, and increased susceptibility to illness and disease (Hartley, 2011:1). Limited schooling and poorer health further pose the risk of restricted access to health information and training about tactile stimulation, which in turn, increases the risk of tactile deprivation.

4.3.9. Mode of delivery

More than half (53.7 %, n=22) of the participants had delivered by caesarean section, due to an obstetric or fetal complication, while 46.3% (n=19) delivered by vaginal birth.

The World Health Organization (WHO) (Gibbons, Belzan, Lauer, Betran, Merialdi & Althabe, 2010:5) recommends that caesarean section births should not exceed an upper range of 20% of the total number of births at a facility. Delivery statistics at MMH reflected that the percentage of caesarean section births for the year 2008 had consistently exceeded the upper limit of 20% (Fawcus, 2008:1). Contributory factors to the persistently high caesarean section rates included (a) MMH being a secondary referral hospital, providing caesarean section delivery services to both resident medium to high risk women when clinically indicated, and to women being referred by the primary midwifery obstetric units in cases of perinatal complications, (b) the WCP experiencing an ongoing influx of foreign nationals and inhabitants from adjoining provinces who require health care (Sanders *et al.*, 2007:33) and (c) the high incidence of hypertension amongst pregnant teenagers and primiparae under the age of twenty-four years, who often require emergency interventions in the form of caesarean section deliveries (NDoH, 2008:48).

Caesarian section births compared with vaginal deliveries carry a heavier workload (Fraser & Cooper, 2005:588) With just over 50% of mothers having delivered by caesarean section, the question could be asked whether health care workers have sufficient time at their disposal for the provision of total patient care (which includes the provision of adequate patient education).

4.3.10 Birth weight

All but one (97.6%, n=40) of the infants of the study participants weighed more than 2500 grams. This finding was in contrast with the high low birth weight statistics (16%) being reported for the WCP (Berry & Hendricks, 2006:1). Although only one participant in the study had given birth to an infant weighing less than 2500 grams, low birth weight contributes significantly to child morbidity and mortality of the under five age group in the WCP (Sanders *et al.*, 2007:6). The under five mortality rate for the WCP is 46/1 000 of live births, ranging from 15 to 45/1 000 live births across the various districts (Sanders *et al.*, 2007:9). The study was performed in a metropolitan area having a different patient profile and disease burden, compared with those of peri-urban and rural areas. A repetition of the same study at a different level of care, or in a rural area, may therefore generate higher low birth weight statistics.

4.3.11 Gravidity and parity

The majority (78%, n=32) of the participants were pregnant for the first time, whilst 14.6% (n=6) reported having had one, and 7.3% (n=3) having had two abortions. The type of and the reasons for the abortions were not investigated in this study. A future study is required to explore the reasons why women, who subsequently delivered, sought to have an abortion(s).

First time, rather than second or third time mothers, were sampled for taking part in this study, in order to assess their current knowledge of tactile stimulation, without having been subjected to a prior mothering experience. The women who had abortions were included in the study, as their previous pregnancies had not resulted in viable births and thus no exposure to the role of mothering.

4.3.12 Pregnancy planning

The majority (53.7%, n=21) of the participants reported unplanned pregnancies, while 46.3% (n=19) reported a planned pregnancy. The findings confirm statistics that show that 53% of pregnancies in South Africa are either unplanned or unwanted (Morrison *et al.*, 2007:7). A cross tabulation between pregnancy planning and knowledge about the importance of tactile stimulation revealed no significant difference. With both groups having displayed low levels of knowledge about the importance of tactile stimulation, the conclusion was made that irrespective of whether women had planned or not planned their pregnancies, they all had entered their pregnancies with minimal

knowledge about the importance of tactile stimulation during infancy and early childhood. A need was identified for antenatal services to ensure that patient education regarding the importance of tactile stimulation during infancy and early childhood forms part of the antenatal patient education.

4.3.13 Primary caregiver

Sixty percent (n=25) of the participants indicated that they would be caring for their infants during the first four months post delivery.

The question pertaining to care giving during the first four months post delivery was posed, in order to ascertain who the primary caregiver of the infant over this important developmental period would be. Since the South African law stipulates that working women are entitled to four months of maternity leave (Republic of South Africa, 1997:14), this period was used as a parameter for establishing whether the mother would be the primary caregiver.

Although every infant is born with the genetic capacity to form and maintain healthy emotional relationships, the release of the genetic potential is, however, brought about by attentive care giving and touch during the infancy period (Perry, 2001:2). Unlike the pregnancy period when there is a spontaneous establishment of neural circuits in the fetal brain (Bergman, 2007:5), the brain of the newborn infant is dependent on various sensory experiences, especially tactile stimulation, for neural circuits to undergo a further process of stabilisation and refinement (Bergman, 2007:17).

Tactile stimulation during infancy and the early childhood period plays a pivotal role in the laying of strong foundations not only for current and future physiology (Blackwell & Cattaneo, 2007:2), but also cognitive, intellectual, emotional, and the social abilities of the child (NDoH, 2001:2).

Twenty two percent (n=9) of the participants reported that a grandmother would be the primary caregiver, while 17% (n=7) indicated that the role of caregiving would be performed by someone, unrelated to the infant.

Newborn infants, who are removed from their mothers for prolonged periods of time, are at risk of experiencing the phenomenon, known as the “protest-despair” response.

This response is known to create unfavourable changes in the infant brain, resulting in negative behavioural patterns that are irreversible and lifelong (Bergman, 2003:23). Failure to rectify “protest-despair” experiences early in life, could contribute to infants growing up with defective mental health and the inability to be flexible in future life situations (Bergman, 2004:1).

Infants who frequently use their stress related neural paths in infancy, lose their pleasure related neural paths, resulting in the stress driven neurological pathways gaining dominance. Although the brain has the ability to later in life compensate for various losses, this, unfortunately, does not apply to the loss of the pleasure related paths during infancy.

The fact that 39% (n=16) of the participants reported someone other than themselves as being the primary caregiver during the first four months post delivery, emphasises the importance of ensuring that caregivers also be made knowledgeable about the importance of tactile stimulation.

4.4 Knowledge of tactile stimulation

This section presents the existing levels of knowledge that participants reported to have with regards to tactile stimulation and tactile deprivation during infancy and early childhood, with statistical significance being reported where applicable.

Due to tactile stimulation impacting on the physical, emotional, bonding, and social domains of the infant (Field, 2004:vii), questions posed were to obtain insights into participants’ existing levels of knowledge with regards to the impact of tactile stimulation on these specific domains. The overall knowledge and percentage scores are discussed under the various domains.

4.4.1 Overall knowledge score

This section presents the overall (combined) and individual knowledge scores for the four specific domains investigated during this study, as summarised in table 4.2.

Table 4.2: Knowledge scores of the four domains

Domain	Minimum %	Maximum %	Mean %
Bonding	40	100	81
Emotional domain	33	100	75
Physical domain	0	83	52
Social domain	0	100	43
Overall knowledge score	33	86	63

The mean overall knowledge score for questions on bonding was 81%, with the scores ranging between 40% and 100%. The mean overall knowledge score regarding the emotional impact was 75%, with scores ranging from 33% to 100%. The mean score for the overall knowledge about the physical domain was 52%, with the scores ranging between 0% and 83%. Of all the domains investigated, scores regarding participants' knowledge about the impact of tactile stimulation on the social domain had the poorest outcome, with the scores ranging from 0% to 100%, with a mean score of 43%. The overall knowledge scores for the four domains reflected a minimum of 33% and a maximum of 86%, with the mean being 63%.

It was evident from the outcomes that the participants had a higher level of knowledge about the impact of tactile stimulation and deprivation on the bonding and emotional domains, than about the impact thereof on the physical and social development of infants and young children. The implications of these findings are that, due to maternal ignorance about the comprehensive importance of tactile stimulation, infants could unintentionally grow up without fully benefiting from the advantages of tactile stimulation.

When comparing the different domains, the mean overall knowledge score regarding the social impact of tactile stimulation, was significantly lower than that of the emotional impact (43% *versus* 75%, LSD, $p \leq 0.01$), and that of bonding (43% *versus* 81%, LSD, $p \leq 0.01$). Equally, the overall mean of the physical impact was significantly lower, compared with the emotional impact (52% *versus* 75%, LSD, $p \leq 0.01$) and bonding (52% *versus* 81%, LSD, $p \leq 0.01$). These findings suggest that when compared with the bonding and emotional domains, the participants were significantly less

knowledgeable about the impact of tactile stimulation on the physiological processes, such as nutrition, cardio-pulmonary stability, oxygenation (Bergman, 2003:23), and the long-term social impacts of tactile deprivation, such as aggression, substance abuse, violence, low cognitive ability, and sociability (Bergman, 2007:241). With the literature confirming the association between tactile deprivation and social pathologies (Field, 2004:x), it could be argued that infants in the Cape Town Metropole could be at high risk of growing up with a predisposition to these social pathologies should their mothers be ignorant about the association. .

4.4.2 Knowledge about tactile stimulation strategies

Participants were generally knowledgeable about the various tactile stimulation strategies that could be implemented during infancy and early childhood. The majority (92.7%, n=38) perceived stroking to be a tactile strategy, with 90.2% (n=37) being familiar with hugging as a tactile strategy, 90.2% (n=37) regarded massaging as a tactile strategy, and 51.2% (n=21) perceived touching to be a tactile strategy. These findings are tabulated below in table 4.3.

Tactile stimulation is an inherent human need that not only makes individuals feel safe, comfortable and loved, but plays an intrinsic role in the normal development of every child (Field, 2004:ix). Stroking, hugging, massaging, and touching are phenomena commonly being practiced in many communities, and are known to aid in producing well adjusted children and adults (Montagu, 1986:292). Conversely, a lack of tactile stimulation strategies contributes to a multitude of problems, ranging from physical (Bergman, 2003:23), to emotional (Field, 2004:viii) and social (Perry, 2002:4).

Mothers had an inborn need to interact with their infants during the immediate post delivery period (Klaus *et al.*, 2004:101). This factor could explain why participants were overall knowledgeable about the various tactile stimulation strategies. Although familiar with the various tactile stimulation strategies, the sections below revealed that participants were less informed about the potential impact of tactile stimulation on the emotional, bonding, social, and physical domains of human beings.

Table 4.3: Knowledge about tactile stimulation strategies

Tactile stimulation strategies	n=41			
	Yes	No	Don't know	% Correct
Stroking is a tactile strategy	38	0	3	92.7
Hugging is a tactile strategy	37	2	2	90.2
Massaging is a tactile strategy	37	1	3	90.2
Touching is a tactile strategy	21	8	12	51.2

4.4.3 Knowledge about the impact of tactile stimulation on the bonding relationship between the mother and newborn

The overall mean knowledge score for the impact of tactile stimulation on the bonding relationship was 81%, with scores ranging between 40% and 100%, as shown above in table 4.3.

Five questions were posed to the participants in order to measure their levels of knowledge about the potential impact of tactile stimulation and tactile deprivation on the bonding relationship between a mother and her infant. The findings are summarised below in table 4.4

Most participants 97.6% (n=40) felt that touch was a form of communication between a mother and her infant, while 95.1% (n=39) felt that touch strengthened the mother-infant bond. The majority (90.2%, n=37) of the participants were of the opinion that mothers, who regularly held their infants, would feel more comfortable about their mothering role. Seventy-percent (70.7%, n=29) felt that stroking the infant's skin while feeding, would disturb the infant, while 43.9% (n=18) believed that bathing should only be used to cleanse an infant.

Experiential learning is described as the generation of knowledge, due to one being subjected to an experience (Kolb & Kolb, 2005:193). Communities in the Western Cape are known to teach the art of infant massaging from one generation to the next (Jewkes, Abrahams & Mvo, 1998:15). One could deduce that the high mean score of 81% for the bonding domain could be due to participants having been subjected to experiential learning, as brought about by their socialisation processes.

Table 4.4: Knowledge about the impact of tactile stimulation on the bonding relationship

Bonding relationship	n=41			
	Yes	No	Don't know	% Correct
Touching is a form of communication between mother and infant	40	0	1	97.6
Touch strengthens the bond between mother and infant	39	2	0	95.1
A mother who regularly holds her infant feels better about her mothering role	37	2	2	90.2
Stroking the infant's skin while feeding will disturb the infant	6	29	6	70.7
Bath time is only for cleansing the infant	18	21	2	43.9

4.4.4 Knowledge about the impact of tactile stimulation on the emotional domain of the infant

As reported above in table 4.3, the overall mean score for the emotional domain was 75%.

The participants scored between 66% (n=27) and 93% (n=38) for five of the six questions pertaining to the impact of tactile stimulation on the emotional domain of a child, as summarised below in table 4.5. The majority (92.7 %, n=38) of the participants correctly indicated that stroking gives infants a sense of security, 90.2% (n=37) agreed that hugging gives infants a sense of emotional security, and 73.3 % (n=30) felt that allowing infants to cry themselves to sleep would not help with disciplining an infant. A further 73.2 % (n=30) were aware that infants would not only cry when they are hungry, and 65.9% (n=27) answered that hugs would not lead to spoiling an infant. Fifty nine percent (n=24) of the participants were of the opinion that infants cry more if not regularly touched.

At the turn of the twentieth century, many paediatricians encouraged mothers to keep an emotional distance from their infants, by feeding by the clock, rather than on demand, and allowing infants to cry until it was time for the next feed. Activities, such as kissing or hugging infants and allowing them to sit on a parent's lap, were also discouraged (Montagu, 1986:150).

Recent studies have revealed that infant crying for extended periods of time have detrimental effects on various physiological processes (Bergman, 2003:23). Although 73.2 % (n=30) correctly answered that infants do not only cry when hungry, just over half of the participants (59.0%, n=24) knew that infants would cry more if not regularly touched.

The findings suggested that although participants were knowledgeable about the impact of tactile stimulation on the emotional domain of infants and children, they showed a lack in the ability to draw associations between “hugging gives infants emotional security” (90.2%, n=37) and “infants cry more often if not regularly touched” (59.0%, n=24).

Table 4.5 Knowledge about the impact of tactile stimulation on the emotional domain of the infant

Emotional domain	n=41			
	Yes	No	Don't know	% Correct
Stroking gives the infant a sense of security	38	2	1	92.7
Hugging gives the infant emotional security	37	0	4	90.2
Letting the infant cry itself to sleep helps with disciplining it	6	30	5	73.2
The infant only cries when being hungry	8	30	3	73.2
Giving the infant extra hugs will lead to spoiling	13	27	1	65.9
The infant cries more often if not regularly touched	24	11	6	59.0

4.4.5 Knowledge about the impact of tactile stimulation on the physical domain of the infant

The overall mean knowledge score for the impact of tactile stimulation on the physical domain of the infant was 52%, with the scores ranging between 0% and 83%, as shown above in table 4.3.

Six questions were posed to the participants in order to ascertain their existing levels of knowledge regarding the impact of tactile stimulation and tactile deprivation on the

physical domain of infants and children. The findings reported below in table 4.6, revealed that for three of the six questions, the participants had high knowledge scores that ranged from 80.5% (n=33) to 92.7% (n=38), whereas for the rest of the questions, the knowledge scores ranged between 12.2% (n=5) and 24.4% only (n=10).

Ninety three percent (92.7%, n=38) of the participants knew that skin to skin contact between a mother and her baby helps to keep the infant warm. Ninety percent (90.2%, n=37) of the participants knew that massaging strengthens the muscles of an infant, and 81% (n=33) knew that massaging helps infants sleep for longer periods. Regarding the physiological impact of tactile stimulation, a quarter of the participants (24.4%, n=10) knew that a lack of touch may weaken an infant's immunity, and 12.2 % (n=5) were aware that regular touching contributes to the boosting of an infant's immune system. Five participants (12.1%) knew that massaging contributes to weight gain during the infancy period.

As previously mentioned under section 4.4.3, a common practice amongst communities in the Western Cape involves massaging infants with Dutch remedy preparations to strengthen muscle tone and aid infants in sleeping for extended periods of time (Jewkes *et al.*, 1998:15). Recent anecdotal evidence has confirmed that this practice is still being practiced by the communities in the Cape Town Metropole region (Marcus, 2011:n.p.). It could thus be postulated that the high scores of 90.2% (n=37) for "massage strengthens infant's muscles" and 81% (n=33) for "massage helps infants sleep for longer periods", could be based on participants' experiential knowledge, as a result of family and community exposure.

Table 4.6: Knowledge about tactile stimulation on the physical domain of the infant

Physical domain	n=41			
	Yes	No	Don't know	% correct
Skin to skin contact between mom and baby keeps the baby warm	38	0	3	92.7
Massaging strengthens the infant's muscles	37	1	3	90.2
Massaging helps the infant to sleep for longer periods	33	1	7	81.0
Lack of touch can weaken the infant's immunity	10	20	11	24.4
Massaging helps the infant to gain weight	5	10	26	12.2
Regular touching strengthens the infant's immune system	5	20	16	12.2

4.4.6 Knowledge about the impact of tactile stimulation on the social domain of the infant

Knowledge about the impact of tactile stimulation on the social domain of the infant achieved the lowest score, ranging from 0% to 100%, with an overall mean of 43%, as reported above in table 4.3.

Four questions were posed to the participants in order to ascertain their knowledge about the impact of tactile stimulation and tactile deprivation on the long-term, social development of infants and children. The data is summarised below in table 4.7.

Sixty three percent (63.4%, n=26) of the participants were aware that regular touching would help infants form a good self image. Fifty six percent (n=23) were knowledgeable about the connection between tactile deprivation and potential problems with anger control later in life. Thirty two percent (n=13) of the participants knew that tactile deprivation during infancy and childhood may have a detrimental effect on the learning abilities of children, and 20% (n=8) knew that a relationship exists between tactile deprivation during infancy and childhood, and the risk of substance abuse later in life. A higher proportion of Coloured than African participants lacked this knowledge (90% *versus* 58%, χ^2 , $p=0.03$).

The literature shows that regular tactile stimulation during the early childhood period contributes to improving an individual's self image later in life (Derbyshire, 2010:25); the establishment of neural pathways responsible for language and intelligence (Bergman, 2007:23); and increasing brain growth (Bergman, 2007:23). Conversely, tactile deprivation may lead to stunting of neural connections and synapses during infancy (Knight, 2010:1) which may have a detrimental effect on the learning abilities of children (Borisova, 2010:4); behaviour patterns such as adult aggression and anger (Perry, 2001:5), extreme shyness (Bergman, 2007:184), and violence (Field, 2004:x),

Substance abuse statistics amongst the youth in the WCP is high (CTDCC, 2009:1). Taylor *et al.* (1989:22) allude to the fact that human beings are multi-dimensional beings, thus having a need for all dimensions to be nurtured. Besides the need for physical sustenance, infants also have the need for emotional nurturing in the form of stroking, hugging, holding, and massaging (Field, 2004:ix). The absence of tactile deprivation could therefore result in children growing up without receiving the necessary emotional nurturing thus seeking to fill this emotional void, by using and / or abusing various illicit substances that give them a sense of pleasure and wellbeing (Knight, 2010:1).

The fact that knowledge scores ranged from 20% to 63% reveal a need to investigate whether a determining factor for the high substance abuse (CTDCC, 2009:1), violence and crime (Gie & Haskins, 2007:7), and low literacy rates (Casey, 2009:1) could be rooted in mothers lacking knowledge about the important role that tactile stimulation plays in the social development of children.

Table 4.7: Knowledge about tactile stimulation on the social domain of the infant

Social domain	n=41			
	Yes	No	Don't know	% Correct
Regular touching during infancy helps to form a good image of self	26	7	8	63.4
Lack of touch leads to aggression/anger later in life	23	4	14	56.1
Lack of touching in infancy could lead to learning problems later in life	13	13	15	32.0
Lack of touch in infancy may lead to drug use later in life	8	14	19	20.0

4.5 Patient training and awareness

Information on training and awareness was included, with the purpose of determining how often the participants had reported for antenatal care during their pregnancies, and whether information on the importance of tactile stimulation during infancy and early childhood had been offered by the health care providers.

4.5.1 Antenatal clinic attendance

Antenatal clinic attendance is reflected in table 4.8 below. Fifty four percent (n=22) of the participants had reported for antenatal on more than six occasions, 34% (34.1%, n=14) between four and six times, and 12% (n=5) between one and three times during their pregnancy. A cross tabulation of the frequency of antenatal clinic attendance (for all categories of attendance) against the specific domains being explored in this study, revealed significant scores for the following domains, i.e. overall knowledge (Spearman, $p < 0.01$), emotional (Spearman, $p < 0.01$) and bonding (Spearman, $p < 0.01$). The findings, as tabulated in table 4.9, suggest a positive correlation between the frequency of antenatal visits and the respective overall knowledge score. There was no statistical significance for knowledge about the physical and social domains.

One of the aims of providing antenatal care is to prepare pregnant woman to care for their newborn infant (Fraser & Cooper, 2005:253). In South Africa, pregnant women who are otherwise healthy normally have five antenatal visits scheduled for their pregnancy (MRC, 2005:17). MMH functions predominantly as a referral centre for pregnant women, who have developed a complication during the perinatal period (MRC, 2005:89). This study shows that more than half of the participants (53.6%, n=22) had reported for antenatal care on more than six occasions, thus suggesting that these women had complicated pregnancies.

The findings, as tabulated in table 4.9, could be an indication that health care workers had failed to share information on the impact of tactile stimulation on the physical and social domains. Alternatively, the observed positive associations concerning the emotional and bonding domains could be attributed to participants having entered the role of motherhood with experiential knowledge (Kolb & Kolb, 2005:193), acquired through family or community exposure.

The study findings suggest that mothers had not received adequate information and training on the impact of tactile stimulation and deprivation on the various domains of infants and children. A need exists to explore the existing levels of knowledge of health care workers regarding the important role that tactile stimulation plays during infancy and early childhood. With more than half of the participants (53.6%, n=22) having attended antenatal clinic on more than six occasions, ample time had been available to ensure that women received the necessary information and training regarding the importance of tactile stimulation during motherhood.

Table 4.8: Antenatal clinic attendance frequency

Class interval	n=41	100%
1-3 visits	5	12.2%
4-6 visits	14	34.1%
> 6 visits	22	54.0%

Table 4.9: Cross tabulation: Antenatal clinic attendance frequency and knowledge regarding the four domains

	1 Variable 1	2 Variable 2	3 Spearman	4 Spearman p-value	5 No of cases
1	Antenatal clinic attendance	Knowledge score	0.48	<0.01	41
2	Antenatal clinic attendance	Emotional impact	0.46	<0.01	41
3	Antenatal clinic attendance	Physical impact	-0.00	0.99	41
4	Antenatal clinic attendance	Bonding impact	0.52	<0.01	41
5	Antenatal clinic attendance	Social impact	0.16	0.33	41

4.5.2 Provision of information and health promotion

The variable of training and health promotion was included in the questionnaire, with the purpose of assessing whether information on tactile stimulation had formed part of the patient education being provided during the antenatal and postnatal periods. Data on health promotion being provided during the antenatal period is shown in table 4.10, and during the immediate postnatal period in table 4.11.

The majority of the participants (78.0%, n=32) indicated that they would have been interested in parent classes had they been offered. Seventy-three percent (n=30) indicated that they had resorted to reading magazines to improve their knowledge and skills about pregnancy, labour and delivery, and parenting. No specific magazines were mentioned during the interviews. Twenty percent (n=8) of the participants reported that a health care worker had spoken to them about the importance of touching their infants, whereas 15% (n=6) indicated that they had received some form of educational material on the importance of touching their infants, whilst attending the antenatal clinic and 10% (n=4) reported that parent classes were offered.

Questions pertaining to information and health promotion during the immediate postnatal period revealed that 93% (n=38) of the participants felt confident about their newly acquired mothering role, 83% (n=34) had been encouraged to practice skin to skin contact, and 34% (n=14) had been given advice on how to keep their infants warm. Of these fourteen participants, 57% (n=8) had been informed about skin to skin contact as a strategy for temperature control, while 43% (n=6) had been advised to dress their infants with warm clothing. Although 83% (n=34) reported that they had been encouraged to practice skin to skin contact, only 20% (n=8) had been advised that this could be used as a strategy to keep their infants warm.

The findings show that although most mothers 83% (n=34) had been encouraged to practise skin to skin contact, only 20% (n=8) had been informed that skin to skin contact could be used as a strategy to keep infants warm. These outcomes suggested that although health care workers had been informing mothers about “what to do”, they had failed to disclose “why it should be done”. This finding indicates the possibility that health care workers themselves may be lacking the necessary knowledge about the physiological benefits of tactile stimulation and that further research on health care worker knowledge is needed.

Although 34.1% (n=14) of the participants had attended the antenatal clinic between four and six times, and 53.6% (n=22) on more than six occasions, the findings reveal that very limited information and health promotion regarding tactile stimulation had taken place during the antenatal period. It thus appears that the antenatal visits had not been optimally utilised by nurses for information sharing and health education

regarding the benefits of tactile stimulation and the risks of tactile deprivation the early childhood period.

Table 4.10: Training and health promotion: antenatal period

Training and health promotion	n=41	100%
Indicated interest in parent classes	32	78.0
Read magazines to improve knowledge and skills about pregnancy, labour and delivery, and parenting	30	73.2
Health care worker spoke about the importance of touching the infant	8	20.0
Mother received educational material on the importance of touching the infant	6	15.0
Parent classes offered	4	10.0

Table 4.11: Training and health promotion: immediate postnatal period

Training and health promotion	n=41	%
Confident about her mothering role	38	93.0
Encouraged to practice skin to skin contact	34	83.0
Advised on how to keep her infant warm	14	34.1
- <i>skin to skin</i>	8	57.1
- <i>dress warm in baby clothing</i>	6	43.0

4.6 Emerging themes

The structured interview concluded with an open ended question which allowed mothers to voice their opinions regarding the care and training received, and to offer any additional comments and / or recommendations. By using the method being developed by Culp and Pilat (1998:3), as explained in chapter 3, the qualitative data was quantified to strengthen the outcomes of the study. From the qualitative question posed, nine descriptors were identified, which were grouped into five themes, i.e. antenatal care, adequate care, staff attitude, postnatal care and professionalism, as shown below in table 4.12, with each of the themes being discussed below.

4.6.1 Antenatal care

Seventeen participants rendered comments regarding the antenatal care that they had received. Of these, thirteen suggested that information and literature on labour, birth and matters pertaining to the post delivery period (cord care, infant bathing and infant

feeding matters) should be provided when attending the antenatal clinic. Two participants requested that birth education classes be provided to patients. One participant commented that she would have liked to have been examined by the same midwife at each antenatal visit. Another suggested the implementation of an antenatal clinic appointment system.

The spontaneous suggestions that were offered by the participants indicate the need, not only for information and training about tactile stimulation, but also about general matters regarding child care.

4.6.2 Adequate care

Twelve participants indicated that they were satisfied with the care being rendered, while eight refrained from commenting. No specific criteria were used to determine the level of satisfaction; the aforementioned were the comments that participants offered when asked whether they had any suggestions.

4.6.3 Staff attitude

Six participants commented on the attitudes of the health care workers who had taken care of them while being hospitalised. Of these, four were of the opinion that health care workers needed to improve their attitudes towards patients, and two suggested that doctors should speak to patients while examining them.

4.6.4 Postnatal care

Five participants suggested that nurses should provide mothers with infant feeding support during the postnatal period. As all of these participants had their infants delivered by caesarean section, they had experienced difficulty with mobility during the first 24 hours post delivery.

4.6.5 Professionalism

Three participants made reference to the professional behaviour of the staff that had provided care. One participant emphasised the lack of professionalism of a staff member based at the referring perinatal clinic, while two reported that they had been examined by a doctor who had not introduced himself, or who was unidentified.

The Batho Pele Initiative (Muller, 2005:9), along with many other codes of conduct and pledges (Muller, 2005:4), aim at ensuring that patients are treated with dignity and respect. The Patient's Rights Charter states that every patient has the right to be examined by a named health care worker (Muller, 2005:6). There is a need for clinical managers to ensure that all health care workers function within the parameters that govern them as public servants.

Table 4.12: Themes yielded from the qualitative data

Theme	n=41	100%
Theme: Antenatal care	17	42.0
Provide information on labour, birth and postnatal issues (feeding, cord care, infant bathing)	13	77.0
Offer birth education classes	2	12.0
Examination by the same midwife at every antenatal visit	1	6.0
Implement an antenatal appointment system	1	6.0
Theme: Adequate care	12	29.3
No comments offered	8	20.0
Theme: Staff attitude	6	15.0
Health care workers to improve their attitudes towards patients	4	67.0
Doctors to speak to mothers while examining them	2	33.3
Theme: Postnatal care	5	12.2
Nurses to provide postnatal support, e.g. with breastfeeding	5	12.2
Theme: Professionalism	3	7.3
Doctors to wear some form of identification and to introduce themselves	2	67.0
Midwife obstetric unit (MOU) staff lack professionalism	1	33.3

4.7 Conclusion

Chapter 4 presented, interpreted, and discussed the analysed data. The aim was to explore the level of knowledge of first time mothers attending MMH about the importance of tactile stimulation during infancy and the early childhood development period.

The mean age of participants in this study was found to be comparable with the mean age of first time mothers in South Africa (Amoateng, 2004:35), with the race

representivity being congruent with the demographics for the WCP (Punt *et al.*, 2005:2). Close to three quarters of the participants reported being married, whilst more than half reported not having planned their pregnancies. Just under half of the participants reported being unemployed. More than half of the infants of the participants were delivered by caesarean section and only one infant weighed less than 2500 grams. Sixty percent of the participants reported that they would be the primary caregivers for the first four months post delivery.

Most participants were knowledgeable about the various tactile stimulation strategies entertained during infancy and early childhood. Where the majority of participants were knowledgeable about the impact of tactile stimulation on the bonding relationship and on the emotional domain, just over half of the participants knew that tactile stimulation has an impact on the physical domain, whilst a smaller proportion was aware that tactile deprivation could have a negative impact on the future sociability and cognitive ability of a child.

One third of the participants were aware of the effect that tactile stimulation could have on the learning ability of children, and less than a quarter of the participants knew that a correlation exists between tactile deprivation and the risk of substance abuse later in life. A higher proportion of Coloured than African participants, the two main ethnic groups represented in the study, lacked the necessary knowledge about the connection between tactile deprivation and the risk of substance abuse later in life (90% *versus* 58%, χ^2 , $p=0.03$).

More than half of the participants reported for antenatal care on more than six occasions. Antenatal visits had however not been optimally utilised for information sharing about the importance of tactile stimulation during infancy and early childhood.

The open ended question generated several suggestions, with participants expressing a need for information and training about tactile stimulation and general matters pertaining to infant care, postnatal support with infant feeding matters, and improvement in the professional conduct of health care workers.

In conclusion, the study findings reveal that overall, irrespective of the demographics of the participants, first time mothers were not adequately informed about the importance of tactile stimulation during infancy and early childhood. Of concern is the fact that

more than half of the participants did not plan on falling pregnant, and just under half reported being unemployed – factors that could impact on the acquisition of knowledge about tactile stimulation.

Chapter 5 concludes the thesis by providing an overview of pertinent findings, as well as comments on certain limitations of the study. Recommendations, congruent with the lack in knowledge identified amongst patients, and suggestions offered by the participants in the study, are presented in order to recommend possible steps to improve the knowledge of first time mothers regarding the importance of tactile stimulation during infancy and early childhood.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Grounded in the study findings, chapter 5 draws conclusions regarding the knowledge of first time mothers about the importance of tactile stimulation during infancy and early childhood. The conclusions are discussed in accordance with the study objectives and demonstrate the achievement of each. Underpinned by the empirical evidence, recommendations are presented in order to increase the existing levels of knowledge of mothers and health care workers regarding the importance and application of tactile stimulation. Chapter 5 further outlines the identified areas for future research, describes the limitations of this study, and ends with the final conclusions of the study.

5.2 Achievement of the aims and objectives of the study

The aim of this study was to explore the level of knowledge of first time mothers attending MMH regarding the importance of tactile stimulation during infancy and the early childhood period. Accordingly, specific study objectives were identified and achieved, as summarised below and in table 5.1.

5.2.1 Objective 1: To establish the existing level of knowledge of first time mothers about tactile stimulation strategies during infancy and early childhood

As discussed in section 4.4.2, the participants were generally familiar with the various tactile stimulation strategies: 92.6% (n=38) perceived stroking to be a tactile strategy, 90.2% (n=37) perceived hugging, 90.2% (n=37) regarded massaging and 51.2% (n=21) perceived touching to be a tactile strategy. Studies show that the mothers of newborn infants have an inborn need to touch their infants (Klaus *et al.*, 2002:101). Communities in the Western Cape are known to teach the art of infant massaging from one generation to the next (Jewkes *et al.*, 1998:15; Marcus, 2011:n.p.). These factors could have influenced the tactile stimulation strategy scores.

5.2.2 Objective 2: To determine the existing level of knowledge of first time mothers regarding the impact of tactile stimulation and tactile deprivation on the bonding relationship, and the emotional, physical, and social domains of infants.

The findings indicate that participants' knowledge about the impact of tactile stimulation and tactile deprivation on the various domains varied, with participants being more knowledgeable about the impact on the emotional and bonding domains, but less familiar with regards to the impact on the physical domain, and least aware of the impact on the infant's social domain. The findings are presented per domain.

5.2.1.1 *Emotional domain*

Participants generated a mean score of 75% for their overall knowledge about the impact of tactile stimulation and tactile deprivation on the emotional domain. Most participants (92.7%, n=38), knew that stroking gives infants a sense of security (Field, 2004:9), 90.2% (n=37) acknowledged that hugging gives infants a sense of emotional security (Field, 2004:107), 73.1% (n=30) acknowledged that allowing infants to cry themselves to sleep would not aid in disciplining the child, and 73.1% (n=30) affirmed that infants do not only cry when hungry (Kulkarni, 2010:772). The findings are summarised in table 4.5. No statistical significance was observed.

5.2.2.2 *Bonding relationship*

Participants generated a mean score of 81% (minimum score 40% and maximum score 100%) for their knowledge about the impact of tactile stimulation on the bonding relationship between a mother and her infant. Most questions were well answered: 97.6% (n=40) knew that touch plays a role in communication between a mother and her baby (Field, 2004:52); 95.1% (n=39) knew that touch strengthens the parent-child bond (Scalegbra & Catteneo, 2002:9); 90.2% (n=37) knew that mothers who regularly hold their infants, feel confident about their mothering role, and 70.7% (n=29) correctly answered that stroking while feeding would not disturb the infant (Klaus *et al.*, 2002:104). Half of the participants (51.2%, n=18) felt that bathing time should be utilised for tactile stimulation purposes as well.

5.2.2.3 *Physical domain*

Compared with the overall mean score for the emotional domain (mean=75%) and the bonding domain (mean=81%), the overall mean score for knowledge about the impact of tactile stimulation on the physical domain was 52% (minimum 0% and maximum 83%).

Although participants were fairly knowledgeable about the role that tactile stimulation plays in keeping babies warm (Field, 2004:vii), in strengthening their muscles (Busch & Bordeaux, 2002: 36), and allowing infants to sleep for longer periods, just under a quarter (n=10) of the participants knew that a lack of touch may weaken an infant's immunity (Kulkarni *et al*, 2010:773), five knew that regular touching contributes to the strengthening of an infant's immune system (Buschbach & Bordeaux, 2002:36), and five were aware that touch positively influences the weight gain of infants (Blackwell & Cattaneo, 2007:3). These findings show that the participants although knowledgeable about the impact of tactile stimulation on the emotional and bonding domains, were ill-informed about the impact of tactile stimulation on the physical domain. Irrespective of whether participants had been referred to MMH by the midwife obstetric units, or had attended the antenatal clinic from the time of booking, the questions on immunity and weight gain were poorly answered.

5.2.2.4 *Social domain*

The study findings showed that participants were least knowledgeable about the impact of tactile stimulation / deprivation on the long term social development of infants and children (NDoE, 2001:n.p.) The overall mean score for questions on the social domain was 43% (minimum 0% and maximum 100%) The scores for the various questions that were posed on the social domain are summarised in table 4.7.

Just over 60% (63.4%, n=26) of the participants were aware that regular touching helps infants to form a good self image (Derbyshire, 2010:25), 56%, n=23) knew that an association exists between tactile deprivation and possible problems with anger control later in life (Field, 2004:100), one third (32%, n=13) knew that tactile deprivation during infancy and childhood may have a detrimental effect on the learning abilities of children (Borisova, 2010:2) and 20% (19.5%, n=8) of mothers knew that a correlation exists between tactile deprivation during infancy and childhood, and the risk of substance abuse later in life (Knight, 2010:2).

Although statistically insignificant, 75% (n=9) of the African participants compared with 47.6% (n=10) of the Coloured participants were knowledgeable about the association between tactile deprivation and aggression later in life. No statistically significant association was found between knowledge about the impact of tactile deprivation on the social domain and demographic factors, such as residential area, age, or level of schooling of the participants.

With regards to the relationship between tactile deprivation and the potential for future learning problems (Kokot, 2010:16), the overall mean knowledge score of participants representing the various residential areas was under 50%, ranging from 11% to 47%. Approximately one third of both Coloured (29%, n=6) and African participants (33%, n=4), the two main ethnic groups in the study, knew that a correlation exists between tactile deprivation and the potential for future learning problems.

The findings revealed that more Coloured than African participants lacked the necessary knowledge about the impact of tactile deprivation on the potential for substance abuse later in life (90.5% *versus* 58.3%; χ^2 , $p = 0.03$). There was no significant difference in this knowledge when compared with the demographic factors, such as residential area, age, and level of schooling of the study participants.

Participants were overall knowledgeable about the various tactile stimulation strategies, the impact of tactile stimulation on the bonding and emotional domains, but lacked knowledge about the impact of tactile stimulation on the physical and social domains. The inference is that health care workers may be knowledgeable about the impact of tactile stimulation on the bonding and emotional domains, but lack knowledge pertaining to the impact of tactile stimulation on the physical and social domains of infants. Another factor is that no information sharing about tactile stimulation had occurred and that scores for the emotional and bonding domains were due to participants' experiential knowledge. No statistical significance was observed.

5.2.3 Objective 3: To ascertain whether information about tactile stimulation is being provided by health care workers

All participants had reported for antenatal care, as indicated in table 4.8. Fifty four participants (53.6%, n=22) had attended antenatal clinic on more than six occasions, 34.1% (n=14) between four and six times, and 12.1% (n=5) between one and three times. There were statistically significant associations between a higher frequency of antenatal clinic attendance and a higher level of knowledge about the emotional domain (Spearman, $p < 0.01$) and the bonding domain (Spearman, $p < 0.01$). The knowledge scores for the physical and social domains however showed no statistical significance.

Eighty eight percent (n=36) of participants attended antenatal clinic on four and more occasions, eight participants responded that a health care worker had spoken to them about the importance of touching their infants, and six reported that they had received some form of educational material on the importance of touching their infants. Seventy three percent (n=30) indicated that they had resorted to reading magazines to improve their knowledge and skills about pregnancy, labour and motherhood and 78% (n=32) indicated that if parent education classes were offered they would have attended.

The findings indicate that limited information and health promotion regarding the importance of tactile stimulation had occurred during the antenatal period. It could be argued that the lack of statistical significance for the physical and social domains may be indicative of the health care workers themselves not being knowledgeable about the impact of tactile stimulation on the physical (Table 4.6) and social domains (Table 4.7) of infants and children. An added factor could be that the workload pressures of health care workers in the antenatal clinic (WCDoH, 2009:164) is of such a nature that there is limited time for patient education.

Although 93% (n=38) of participants were encouraged to practise skin to skin contact (Blackwell & Cattaneo, 2007:2), only eight were told that skin to skin contact was a strategy to keep infants warm, while six participants were informed to cloth their infants to provide warmth. The outcome of this finding could be that health care workers may be encouraging mothers to implement the skin to skin strategy, but not know the reason for doing so.

5.2.4 Objective 4: To identify recommendations as proposed by study participants towards strengthening the knowledge about the importance of tactile stimulation during infancy and early childhood at parental and health care provider levels

In response to the open ended question, 80% (n=33) of the participants offered suggestions and recommendations towards improved patient care, 29.3% (n=12) reported that the care received was adequate, while 8 preferred not to make any suggestions or recommendations. Forty two percent (n=17) suggested that over and above information on the importance of tactile stimulation during early childhood, information regarding perinatal matters and infant care should be provided when reporting for antenatal care. Six offered suggestions regarding the attitude of health care workers, five made suggestions about improving postnatal care and three suggested an improvement in the professional stance of the health care worker. These findings are tabled in table 4.12.

Table 5.1 provides the key findings relating to the achievement of the study objectives.

Several recommendations for the possible improvement of future policies and practices, in order to enhance the knowledge and implementation of tactile stimulation among mothers and health care workers, were identified during this study. These recommendations were grounded in the empirical findings, including the suggestions being offered by the study participants. The recommendations are presented and discussed in section 5.3.

TABLE 5.1 Summary of the key findings relating to the achievement of the study objectives

Study objective	Summary of key findings	Text Reference (Section / Table)
To establish the existing level of knowledge of first time mothers about tactile stimulation strategies during infancy and early childhood	Participants were knowledgeable about tactile stimulation strategies (hugging, touching, stroking, massaging).	4.4.2 / Table 4.3
To determine the existing level of knowledge of first time mothers regarding the impact of tactile stimulation and tactile deprivation on the bonding relationship, and the emotional, physical, and social domains of infants.	The majority of participants were knowledgeable about the effect of tactile stimulation on the bonding relationship.	4.4.3 / Table 4.4
	Most participants were knowledgeable about the effect of tactile stimulation on the emotional domain of the infant	4.4.4 / Table 4.5
	Most participants knew that tactile stimulation is a form of communication between mother and infant.	Table 4.4
	Most participants knew that skin to skin helps to keep infants warm; massage strengthens infants' muscles and makes infants sleep for longer periods	4.4.5 / Table 4.6
	Few participants knew tactile stimulation strengthens the immune system and positively impact weight gain in newborn infants	4.5.5 / Table 4.6
	Participants were least knowledgeable about the effect of tactile stimulation/ deprivation on the social domain.	4.4.6 / Table 4.7
	Half of the participants knew about the connection between tactile deprivation and a lack of anger control later in life.	4.4.6 / Table 4.7
	Most Coloured participants did not know about the association between tactile deprivation and substance abuse later in life.	4.4.6 / Table 4.7
	Just over half of the African participants knew about the association between tactile deprivation and substance abuse later in life.	4.4.6 / Table 4.7

To ascertain whether information about tactile stimulation is being provided by health care workers	More than half of the participants had attended the antenatal clinic on more than 6 occasions.	4.5.1 / Table 4.8; 4.9
	Antenatal attendance had increased knowledge of the emotional and bonding domains, but not about the physical and social domains.	4.5.1 / Table 4.9
	Very few participants had been offered parent classes.	4.5.2 / 4.10
	Most mothers had improved their knowledge by reading magazines.	4.5.2 / Table 4.10
	Very few health care workers had spoken to participants about the importance of tactile stimulation / risks of tactile deprivation.	4.5.2 / Table 4.10
	Very few participants had been given educational material on the importance of tactile stimulation / risks of tactile deprivation.	4.5.2 / Table 4.10
	Less than half of the participants had been advised on how to keep their infants warm.	4.5.2 / Table 4.11
To identify recommendations as proposed by study participants towards strengthening the knowledge about the importance of tactile stimulation during infancy and early childhood at parental and health care provider levels	The need to compile a structured, antenatal patient education programme.	Table 4.10; 4.11; 4.12
	Continuing professional development of health care workers regarding tactile stimulation matters.	5.3.1.3; /Table 4.12
	Review of curricula of health care workers to include the importance of tactile stimulation by parents to infants and children.	5.3.1.4
	Policy makers to address the over-saturation of perinatal services.	5.3.2
	Ensuring a therapeutic environment for perinatal health care.	5.3.2.2 / Table 4.12
	Strengthen patient education (antenatal and postnatal) and support.	4.6.1; 5.3.1.1 / Table 4.12
	Enhance professional image	4.6.3; 4.6.5 / Table 4.12

5.3 Recommendations

The recommendations identified are discussed in accordance with the themes that emerged from the analysed data. These themes are presented under the following broad categories, i.e. education, policy and practice, and future research. Each category is discussed in turn.

5.3.1 Education

The following educational recommendations were identified: antenatal education classes, provision of educational material, health care worker training, undergraduate education, and the training and knowledge of crèche workers.

5.3.1.1 *Antenatal education classes*

The study indicated that participants did not only lack the necessary knowledge about the importance of tactile stimulation during infancy and early childhood, but also lacked knowledge about matters pertaining to routine infant care (infant feeding and infant care). The recommendation is made for a structured birthing/parent education programme, covering the importance of tactile stimulation and perinatal topics, such as matters pertaining to labour, delivery and infant care. These classes are to be made available to both women attending the antenatal clinic and their partners and / or surrogate mothers. To effectively implement this strategy, a survey needs to be conducted to ascertain the logistics of such a programme (the length of the slots, subject matter to be included, duration of programme, time of day for classes). To augment the antenatal information and training that takes place in the antenatal clinic, the feasibility of employing a health promoter should be explored.

5.3.1.2 *Provision of educational material*

Based on the study findings, the provision of patient education brochures detailing the importance of tactile stimulation is recommended. Although only one French speaking patient formed part of the study population, feedback from the clinical areas reveal an increase in the number of French speaking women, utilising the services at MMH (Keck, 2009). It is recommended that patient education brochures be compiled in the three official languages (English, Afrikaans and Xhosa) of the WCP, as well as in

French, in order French speaking women also benefit from the information on tactile stimulation.

5.3.1.3 *Health care worker training*

Nurses and midwives, responsible for caring for mothers and their newborn infants, have a responsibility to be familiar with current trends relating to the care that they provide to their patients (Muller, 2005:287). With perinatal care being regarded as a specialist nursing field (Muller, 2005:12), it is important for health care providers to be equipped with the highest possible levels of knowledge regarding current perinatal trends and practices. The study findings indicate a need for improved tactile stimulation information and training at health care worker level. Awareness training regarding the importance of tactile stimulation and tactile deprivation during infancy and early childhood should be strengthened. Regular monitoring and evaluation will ensure both the implementation of tactile stimulation strategies and in determining the efficacy of the training programmes.

5.3.1.4 *Undergraduate education and training*

The numerous therapeutic benefits that tactile stimulation offers infants, has made it a complimentary model of care alongside the sophisticated, technological advancements in infant and child care (Field, 2004:vii). The current, undergraduate curricula for health care workers in maternal and child health care should be examined, to ensure that information on tactile stimulation is included.

Upon appointment to perinatal health facilities, health care workers should receive an orientation, and regular continuing professional development sessions regarding the importance of tactile stimulation.

5.3.2 *Policy and practice*

Recommendations relating to future policies and practices include professionalism, the provision of a therapeutic environment, postnatal care, pregnancy planning, and perinatal service infrastructure.

5.3.2.1 Professionalism

Based on the study findings, there is a need for health care workers to improve their behaviour and attitude towards patients.

To ensure that a standard of professionalism is adhered to, it is recommended that clinical managers regularly monitor and evaluate the professional performances of their team members and ensure that they are positively identified at all times. Patients should be reminded of their rights and be encouraged to use the existing channels (patient satisfaction surveys, complaint procedure) to communicate unprofessional behaviour to the relevant authorities.

5.3.2.2 Provision of a therapeutic environment

Burkhardt and Nathaniel (2002:330) allude to the fact that being able to successfully communicate with one's patients is central to the practice of nursing and health care. Perinatal care warrants regular examinations of the patient's breasts, abdomen and genital area (Theron, 2010:43, 47, 53). Due to these examinations being of a very intimate nature (Theron, 2010:53), it is imperative that health care workers employ the appropriate communication skills when performing these examinations.

In settings of increased patient loads and shortages in human resources (WCDoH, 2009:164), communication skills may easily become eroded. It is thus recommended that a key performance area that covers the soft skills/affective care, be included into staff appraisals so that affective care is monitored on a regular basis.

5.3.2.3 Postnatal care

One of the functions of the midwife in caring for the postnatal patient is to daily assess the condition of the patient and her infant, and to compile a care plan to ensure that all needs are identified and addressed (Treas, 2004:136). Entertaining a holistic approach towards the patient's physical and psycho-emotional status, will ensure the timeous provision of relevant information and postnatal support.

5.3.2.4 Pregnancy planning

A decrease in the use of contraception has been reported as a major contributing factor to the pregnancy rates in the WCP (WCDoH, 2009:164). This trend was reflected by

the number of participants in the study, who reported having had an unplanned pregnancy. (53.6%, n=22). One of the recommendations thus is for resources to be made available to generate the necessary infrastructure and human resources at community health care facility level, to ensure that women have adequate access to family planning services in order to avoid unplanned pregnancies. The efficacy of reproductive health services will aid in denting the load on perinatal services.

5.3.2.5 *Perinatal service infrastructure*

Besides providing a secondary service to referring midwife obstetric units, MMH also provides a primary perinatal service to residents of Mowbray and the surrounding geographical areas. MMH has experienced a steady increase in delivery rates, with up to 40% of women delivering *via* caesarean section (Fawcus, 2008:1).

There is a need for policy makers at provincial level to address the feasibility of establishing a midwife obstetric unit in the Mowbray/Cape Town city area in order to alleviate the burden of patients at MMH. The creation of such a unit would not only improve the nurse-patient ratio, but would allow for the adequate provision of patient education and essential postnatal support.

5.3.3 Future research

Specific topics for possible future research include:

- To ascertain the tactile experiences of youth, residing in areas with high incidences of crime and violence, juvenile delinquency, and teenage pregnancies, during their early childhood,
- To determine whether a similar research study in a rural setting would generate the same findings,
- To explore the knowledge of care providers in early childhood development facilities, such as crèches, about the importance of tactile stimulation during infancy and early childhood,
- To explore the knowledge of perinatal health care providers regarding the importance of tactile stimulation during infancy and early childhood,

- To investigate the need for appropriate training modalities to enhance the knowledge of caregivers and health care providers regarding the importance of tactile stimulation during infancy and early childhood, and
- To investigate the availability of current community education programmes to addresses the creation of an awareness regarding the importance of tactile stimulation and tactile deprivation, with an emphasis on brain development.

5.4 Limitations of the study

This study was undertaken in one urban setting in the WCP. A repeat of this study in a peri-urban or rural setting may present higher numbers of low birth weight infants (weighing less than 2500 grams). It was unfortunately not possible to expand the study to other regions, due to a lack of operational resources and time. A multi-site design should thus be considered for a future study in this particular field.

The expected date of delivery was used as a guideline for determining when each of the participants in this study would deliver. Women however frequently deliver either two weeks before or two weeks after their expected date of delivery. This factor was not taken into consideration when the planning for the data collection period was done. A few participants delivered before and others after the data collection period (1st to 31st December 2008). This resulted in a reduction of the sample size. Due to resource and time constraints, it was not possible to increase the sample size, or to undertake a total population sampling, or to extend the data collection period. Although the study sample was relatively small, it was statistically calculated and endorsed by the statistician from Stellenbosch University, Prof Kidd. In the case of a future study, an extended data collection period would thus be considered.

Despite the limitations, the findings of this study disclosed implications for the effective future provision of tactile stimulation information both at MMH, as well as at other perinatal facilities.

5.5 Conclusions of the study

Based on the findings from the literature review, this was the first study in the WCP to explore the existing levels of knowledge of first time mothers, regarding the importance of tactile stimulation during infancy and early childhood. The findings from the literature review indicated that newborn infants are highly complex individuals with a need for sensory stimulation to aid their overall development (Kulkarni *et al.*, 2010:772). The literature review aptly confirmed the important role that tactile stimulation plays in the lives of infants and young children.

The stated aim and objectives of this study had been achieved (as summarised in table 5.1). The findings revealed that although knowledgeable about tactile stimulation strategies and the impact of tactile stimulation on the bonding relationship and the emotional domain, participants were not adequately knowledgeable about the impact of tactile stimulation on the physical / physiological processes within the body and the long term impact on an infant's social development.

Information and health promotion about the importance of tactile stimulation was found to be lacking, when attending the antenatal clinic and during the participants' postnatal stay in hospital. Despite more than half of the participants having reported for antenatal care on more than six occasions, the findings revealed that these visits had not been optimally utilised by health care workers for information sharing and patient education. The reasons for the lack of patient education being offered by health care workers during these critical contact periods were not investigated during the study and would thus require further investigation, in order to identify and implement appropriate corrective action.

The open ended question generated suggestions for improved health care in the form of educational material on tactile stimulation during infancy as well as general infant care, adherence to professional codes of conduct, and improvement in professional behaviour. It is, however, important to take cognisance of these factors within the context of the over-saturation of perinatal services, the shortages of staff, health care workers working extended hours, and the daily use of agency personnel to complement the workforce quota. There is therefore a need for ongoing operational research to address these areas of concern.

With the study showing that just over half of the participants indicating that they would be the primary caregiver for the first four months post delivery, a need exists for large scale community education to ensure that caregivers (other than the biological mother) who may provide care during the early childhood period also acquires the necessary knowledge regarding the importance of tactile stimulation during infancy and childhood.

In summary, the study findings revealed that, overall, irrespective of the demographic factors, such as age, the reason for hospital delivery, ethnicity, level of schooling, and residential area, first time mothers were not sufficiently knowledgeable about the importance of tactile stimulation during infancy and early childhood. Despite certain limitations of the study, the findings and corresponding recommendations suggest several implications for both MMH and other facilities providing maternal and child health services.

Tactile stimulation during infancy and childhood not only contributes to the physical health, and emotional and social wellbeing of infants and children, but also ensures that children grow up with a sense of security, the potential for optimal learning opportunities, and a decreased susceptibility to social pathologies. In turn, tactile stimulation not only has the potential of building confident and successful human beings but also a strong and healthy nation. The findings from this study emphasises the importance of and the need to increase existing knowledge about tactile stimulation during infancy and early childhood, at the parental, community, and health care provider levels.

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APPENDIX A: Data collection tool

TACTILE STIMULATION IN EARLY CHILDHOOD DEVELOPMENT

Subject number..... Name of interviewer.....

Agreed to be interviewed..... Refused to be interviewed.....

Date of interview..... Duration of interview.....

Interpreter used..... Interview conducted in: Eng. Afri. Xhosa,
Other

AIM

The aim of this study is to ascertain whether first time mothers are knowledgeable about the importance of tactile stimulation (touching, stroking, cuddling, massaging) during early childhood development.

CONFIDENTIALITY

All information shared will be treated as confidential.
Questionnaires are numbered to maintain anonymity

INTERVIEW

1. The interview will last for 15 - 20 minutes.
2. There are 32 questions that will be asked.
3. Subjects are to answer "YES" "NO" or "DON'T KNOW"
4. The information shared will help the researcher identify ways of improving the knowledge of future first time mothers in tactile stimulation strategies.
5. The questionnaire consists 2 parts:

Part A - comprising of demographic information

Part B - comprising of knowledge questions covering the following domains:

- Emotional impact
- Physical impact
- Parental bonding
- Social impact
- Training and awareness

PART A: TICK THE APPROPRIATE BOX

1	Age in years.....	Don't know	
2	Gravidity / Parity	G	P
3	Mode of delivery	Normal Forceps Vacuum Caesarian	
4	Infant's birth weight	< 2500gms > 2500gms	
5	Reason for hospital delivery	Referred Live in area Private patient Other	
6	Residential area	Mowbray Khayelitsha Guguletu Mitchell's Plain Other	
7	Relationship status	Married Permanent partner Single: No partner Single: Divorced Single: Widowed	
8	Ethnicity	Coloured African White Indian Other	
9	Main spoken language	Xhosa Afrikaans English Zulu Other	
10	Schooling completed	No schooling Grade 1 - 7 Grade 8 -11 Grade 12 Tertiary	
11	Able to read	English Xhosa Afrikaans Other	
12	Employment status	None Employed Unemployed Housewife Scholar	
13	Over the next 4 months, who will be caring for your baby	Self Caregiver Grandmother Creche Other	
14	Was this pregnancy planned?	Yes	

No

**PART B: TICK THE APPROPRIATE BOX
KNOWLEDGE**

**YES NO DON'T
KNOW**

EMOTIONAL IMPACT

- 1 Hugging babies gives them a sense of emotional security.
- 2 Babies who are not regularly touched tend to cry more often
- 3 Allowing babies to cry themselves to sleep helps to discipline them
- 4 Giving babies extra attention through hugging leads to spoiling them
- 5 Regular stroking gives babies a sense of security /sense of belonging
- 6 Babies only cry when they are hungry

PHYSICAL IMPACT

- 7 Massaging babies helps them to gain weight
- 8 Lack of touching babies could lead to babies being sickly / having a weak immunity
- 9 Massaging helps to strengthen babies' muscles
- 10 Massaging helps babies sleep for longer periods of time
- 11 Placing a baby naked on it's mother's chest with the baby's skin touching the mother's skin will help to keep the baby warm
- 12 Regular touching between a mother and her newborn baby helps to protect the baby from infection

BONDING

- 13 Baby's bath time should only be used to wash and cleanse the baby.
- 14 Mothers who regularly touch their babies help to strengthen the emotional connection between them and their baby (bonding relationship)
- 15 Stroking a baby's skin while being fed will disturb the baby
- 16 Mothers who regularly hold their babies feel better about their role as mothers
- 17 Touching is one of the ways that mothers can communicate love to their babies

SOCIAL IMPACT

- 18 Babies who are not regularly touched during babyhood may have problems with aggression / anger control later in life
- 19 Babies who are not regularly touched during babyhood may land up using drugs later in life
- 20 Babies who are not regularly touched during babyhood may experience problems with learning later in life.
- 21 Regular touching during infancy helps children to form a good self image

TRAINING AND AWARENESS

- 22 Did you read any magazines on baby care during your pregnancy?
- 23 Did you attend antenatal clinic during your pregnancy?
(If "yes" answer questions 24,25,26,27. If "no" proceed to question 28)
- 24 How often did you attend an antenatal clinic during your pregnancy?
(a) Once
(b) Twice
(c) Three times
(d) Four times
(e) Other
- 25 While attending antenatal clinic, did the nursing staff speak to you about the benefits of touching your baby?
- 26 While attending antenatal clinic, were you given reading matter on the benefits of touching your baby?
- 27 Were parent classes offered antenatally?
- 28 If parent classes were offered antenatally, would you have attended?
- 29 Were you encouraged by the healthcare staff to hold your baby skin-to-skin when your baby was born
- 30 Were you given any advice by the health care staff on how to keep your baby warm?
(If "yes" ask participant to explain what she was told):
(a) dress warmly in baby clothing
(b) practice skin to skin contact
(c) other

- 31 Do you feel confident about providing the necessary care for your baby?
- 32 Are there any suggestions or comments that you would like to make to improve the care and training that this hospital provides to first time mothers?

THANK YOU FOR YOUR TIME - ENJOY YOUR BABY!

APPENDIX B: Ethical committee approval letter



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvennoot • your knowledge partner

17 October 2008

Ms ML Petersen
Division of Nursing
Dept of Interdisciplinary Health Sciences

Dear Ms Petersen

RESEARCH PROJECT : "AN EXPLORATIVE STUDY OF THE KNOWLEDGE OF FIRST TIME MOTHERS ABOUT THE IMPORTANCE OF TACTILE STIMULATION IN EARLY CHILDHOOD DEVELOPMENT"

PROJECT NUMBER : N08/09/263

At a meeting of the Committee for Human Research that was held on 8 October 2008 the above project was approved on condition that further information that was required, be submitted.

This information was supplied and the project was finally approved on 17 October 2008 for a period of one year from this date. This project is therefore now registered and you can proceed with the work.

Please quote the above-mentioned project number in ALL future correspondence.

Please note that a progress report should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly and subjected to an external audit.

Translations of the consent document in the languages applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372

Institutional Review Board (IRB) Number: IRB0005239

The Committee for Human Research complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

Kind regards

pp 

Prof PJT de Villiers

Chairperson: Committee for Human Research

RESEARCH DEVELOPMENT AND SUPPORT (TYGERBERG)

Tel: +27 21 938 9207 / E-mail: mertrude@sun.ac.za

Approval Date: 17 October 2008

Expiry Date: 17 October 2009

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Fakulteit Gesondheidswetenskappe • Faculty of Health Sciences



Verbind tot Optimale Gesondheid • Committed to Optimal Health
Afdeling Navorsingsontwikkeling en -steun • Research Development and Support Division
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E-pos/E-mail: rdsinfo@sun.ac.za

APPENDIX C: Operational approval DoH

28/10/2008 14:51

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FINANCE

Received
27/10/08

PAGE 01/01



Verwysing
Reference
Isilathiso
19/18/RP87/2008
Navrae
Enquines
Imibuzo
Dr T. Naledi
Telefoon
Telephone
Ifowuni
021 483 8901

Departement van Gesondheid
Department of Health
iSebe lezeMp

Ms M. Petersen
41 Viking Close
Thornton
7460
Cape Town

FAX: 021 6852991

Dear Ms Petersen

An explorative study of the knowledge of first time mothers about the importance of tactile stimulation in early childhood development

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research. Please contact the following members of staff to assist you with access to the facilities:

1) Dr P. Mabusela at pmabusela@gwc.gov.za Tel: 021 6595544 (Mowbray Maternity Hospital)

We look forward to hearing from you.

Yours sincerely

MR. J. LEDWABA
CHIEF-DIRECTOR HEALTH PROGRAMMES
DISTRICT HEALTH SERVICES AND PROGRAMMES
DATE: 27/10/2008

Deerpstraat 4
Postbus 2060
KAAPSTAD
8000

4 Deerp Street
PO Box 2060
CAPE TOWN
8000

APPENDIX D: Permission for data collection

Education & Training Department
Ground Floor, Old Nurses Home
Mowbray Maternity Hospital

28 November 2007

Dr. W. Chitha
Senior Medical Superintendent
Mowbray Maternity Hospital

Dear Dr. Chitha

RE: REQUEST TO PERFORM RESEARCH STUDY

I am currently doing the Master's Programme in Nursing through Stellenbosch University.

My research proposal for the above studies is as follows: **An evaluation of first time mothers' knowledge on the importance of tactile stimulation during early childhood development.**

I hereby request permission to draw the population sample for the pilot study as well as the research study from the patients who have delivered at Mowbray Maternity Hospital.

I trust that my request receives your favourable consideration.

Yours sincerely


Melvina Petersen
Chief Professional Nurse
Education & Training Department

Copy sent 29/11/07

Due to viral activity on the computer network of the Western Cape Provincial Department of Health in 2010, the correspondence received granting permission for the research study to take place at Mowbray Maternity Hospital was lost.

The researcher had obtained permission to do the study from the Research Committee of Mowbray Maternity Hospital. The chairperson at the time of applying for permission was Professor Sue Fawcus.

APPENDIX E: Participant information leaflet and consent form

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

TITLE OF THE RESEARCH PROJECT:

An explorative study on the knowledge of first time mothers about the importance of tactile stimulation in early childhood development

REFERENCE NUMBER:	N08/09/263
PRINCIPAL INVESTIGATOR:	Melvina Petersen
ADDRESS:	Education & Training Department Mowbray Maternity Hospital Cape Town
CONTACT NUMBER:	021- 659 5587 / 5588 (work) 083 608 4077 (cell)

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. / I will be spending some time to explain the details of the project to you. Please stop me at any time if you are unsure of what I am saying or what is presented here. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This research study has been approved by the **Committee for Human Research at Stellenbosch University** and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What is this research study all about?

The study will be done at Mowbray Maternity Hospital. Many other mothers will be participating in this study – approximately 70

By doing this study, we are trying to find out what mothers know about touching / massaging their babies. This information will be used in the future to teach mothers how to care for their babies.

Firstly, it is important that you give permission for me to interview you.

Secondly, I will be asking you some questions

None of the information that you share with me will be made available to any other persons.

Once the information has been processed, it will be destroyed.

The findings of the study will be published – you may have access to the report if you so wish

Selection of mothers will be done in a certain order so that all mothers have a fair chance of taking part in this study

Why have you been invited to participate?

You have been invited to take part in this study because we would like to find out what first time mothers know about touching /massaging their babies.

What will your responsibilities be?

Your responsibilities will be to answer the questions that I ask you to the best of your ability

Will you benefit from taking part in this research?

You will not benefit directly from taking part in this study. The information that we receive will however help us to determine whether mothers having babies for the first time have sufficient knowledge on the importance of touching their babies

Are there any risks involved in your taking part in this research?

There are no risks attached to this study

Who will have access to your medical records?

All the information that you share with me will be kept confidential. If the information is published, your identity will not be revealed.

What will happen in the unlikely event of some form of injury occurring as a direct result of your taking part in this research study?

NA

Will you be paid to take part in this study and are there any costs involved?

You will not be paid to take part in the study.

Is there anything else that you should know or do?

You can contact me (Ms Petersen) at 021 6595587 if you have any further queries about the study

You can also contact the Committee for Human Research at 021-938 9207 if you have any concerns or complaints that have not been adequately addressed by the person doing the study

You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I agree to take part in a research study entitled: An evaluation of first time mothers' knowledge, skills and attitudes regarding the importance of tactile stimulation in early childhood development.

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.

Signed at (place) on (date)
2007.

.....
Signature of participant

.....
Signature of witness

Declaration by investigator

I (name) declare that:

- I explained the information in this document to
.....
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use a translator. (*If a translator is used then the translator must sign the declaration below.*)

Signed at (place) on (date)
2005.

.....
Signature of investigator

.....
Signature of witness

Declaration by translator

I (*name*) declare that:

- I assisted the investigator (*name*) to explain the information in this document to (*name of participant*)using the language medium of Xhosa.
- We encouraged her to ask questions and took adequate time to answer them.
- I conveyed a factually correct version of what was related to me.
- I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her question satisfactorily answered.

Signed at (*place*) on (*date*)
2007.

.....
Signature of translator

.....
Signature of witness

APPENDIX F: Patient information poster

RESEARCH STUDY

THE IMPORTANCE OF TOUCHING YOUR BABY

The above study is in progress at Mowbray
Maternity Hospital.

You may be approached by the midwives
in the clinic
to participate in this study

The information gained will assist us in
providing better care to mothers and
babies.

Thank you!