

**Factors influencing high socio-economic class mothers' decision regarding
formula feeding practices in the Cape Metropole**

Thesis

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Master of Nutrition

By

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Degree of Confidentiality:	Grade A
Date:	April 2006

DECLARATION

Hereby I, Marwyn Bester, declare that this thesis is my own original work and that all sources have been accurately reported and acknowledged, and that this document has not previously in its entirety or in part been submitted at any university in order to obtain an academic qualification.

Signed:



Date: 10 October 2005.



ABSTRACT

Objective:

To identify the reasons why high socio-economic class women in the Cape Metropole decide not to breastfeed; to identify the factors that influence the decision-making process when deciding which infant formula to feed the infant aged 0–6 months of age and to evaluate whether the type and volume of infant formula selected by the mother is appropriate for the infant's needs.

Method:

The study was conducted as an observational descriptive study and consecutive sampling was used. Data was collected by means of a self-administered questionnaire that was available both in Afrikaans and English. Both open and closed ended questions were included. A Likert scale comprising four possible answers was used to determine attitude.



Results:

A total of 55 utilizable questionnaires were obtained.

The majority of the mothers decided only after the birth of their infant to rather opt for formula feeding. Evident factors that were identified as a barrier to breastfeeding include a lack of knowledge and experience as well as a lack of facilities at public places and at work to breastfeed.

Perceived benefits of infant formula included that the father could help with the workload and thus the father does not feel left out if the mother is breastfeeding, the mother knows what volume of infant formula the infant receives and it is more convenient if she is working.

The mothers were overall not concerned about possible side effects of breastfeeding e.g. leaking and engorgement and did not feel that their breasts were physically not of optimal physiology e.g. too small or too large to be able to breastfeed.

Conclusion:

Numerous internal as well as external factors influence high socio-economic class women in the Cape Metropole when they decide whether to breastfeed or formula feed their infants. The identified barriers to breastfeeding will have to be addressed in this population in order to reach the WHO/UNICEF recommendation of exclusive breastfeeding up to the age of 6 months, and thereafter breastfeeding up to 2 years of age with the introduction of appropriate complementary foods.

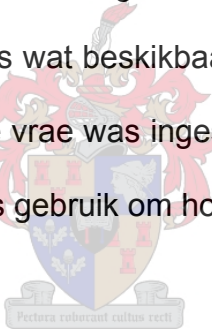
OPSOMMING

Doelwit:

Die identifisering van die redes hoekom hoë sosio-ekonomiese klas vrouens in die Kaapse Metropol besluit om nie te borsvoed nie; om die redes te identifiseer wat die besluitnemingsproses beïnvloed wanneer die moeder besluit om formulemelk vir haar baba van 0-6 maande te gee en om te evalueer of die tipe en hoeveelheid formulemelk geselekteer deur die moeder toepaslik is vir haar baba se behoeftes.

Metode:

Die studie was uitgevoer as 'n waarnemende beskrywende studie en die aaneenlopende steekproef metode was gebruik. Data was ingesamel deur middel van 'n selfonderhoudende vraelys wat beskikbaar was in beide Afrikaans en Engels. Beide oop en geslote eindigende vrae was ingesluit. 'n Likert-skaal wat bestaan het uit vier moontlike antwoorde, was gebruik om houding te bepaal.



Resultate:

'n Totaal van 55 bruikbare vraelyste was verkry.

Die meerderheid van moeders het besluit om eerder met formule te voed na die geboorte van hulle baba. Duidelike faktore wat as struikelblokke vir borsvoeding geïdentifiseer is, sluit in 'n gebrek aan kennis en ervaring van borsvoeding sowel as 'n gebrek aan fasiliteite in openbare plekke en by die werk om te kan borsvoed.

Waargeneemde voordele van formulemelkvoeding sluit in dat die vader kan help met die werkslading en dus voel die vader nie uitgesluit as die moeder borsvoed nie,

die hoeveelheid formulemelk wat die baba ontvang is bekend aan die moeder en formule voeding is meer gerieflik indien sy werk.

Die moeders was oor die algemeen nie bekommerd oor die moontlike nuwe-effekte van borsvoeding, bv. lek van melk en stuwing van die borste nie en het ook nie gevoel dat hulle borste fisiologies nie optimaal was, bv. te klein of te groot, om te kan borsvoed nie.

Gevolgtrekking:

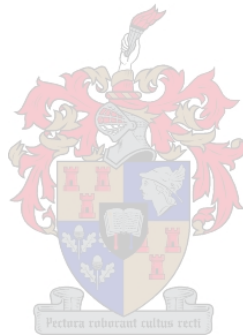
Daar is verskeie interne sowel as eksterne faktore wat hoë sosio-ekonomiese klas moeders in die Kaapse Metropol se besluit beïnvloed wanneer hulle besluit om hulle babas te borsvoed of formulevoed. Die geïdentifiseerde struikelblokke tot borsvoeding moet aangespreek word om die WGO/UNICEF aanbevelings van eksklusiewe borsvoeding tot die ouderdom van 6 maande, en daarna volgehoue borsvoeding tot 2 jarige ouderdom met die insluiting van toepaslike komplementêre voedsel, te kan bereik.

DEDICATION

Jesus, thank you for enabling me to complete my studies, through Your love and power.

I would like to dedicate this thesis to my fiancé, Jacques; my mother, Lizette; my father, Cobus and sister, Elanna. Thank you for all your support and encouragement, but above all for loving and caring for me.

Family and friends.



ACKNOWLEDGEMENTS

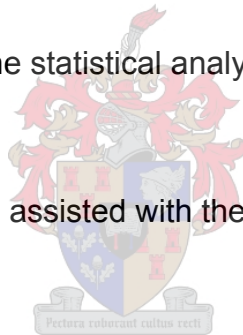
I would like to thank the following people:

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Professor Labadarios and the Department of Human Nutrition, Stellenbosch University, for the opportunity to complete my studies at their institution and the help as well as encouragement, which they provided.

Professor Nel for assisting in the statistical analysis of data.

All mother and infant pairs who assisted with the completion of the questionnaire.



All day care centres as well as private clinics that assisted in the distribution of the questionnaire.

LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
BFHI	The Baby-Friendly Hospital Initiative
CD4	CD4 T-helper cells count
CDC	Centres for Disease Control and Prevention
HIV	Human Immunodeficiency Virus
kg	Kilogram
n	The number of respondents
R	South African Rand
SADHS	The South African Demographic Health Survey
SAVACG	The South African Vitamin A Consultative Group
SIDS	Sudden Infant Death Syndrome
SigA	Serum Immunglobulin A
TB	Tuberculosis Disease
UK	The United Kingdom
UNAIDS	The Joint United Nations Programme on HIV/AIDS
UNICEF	The United Nations Children's Fund
USA	The United States of America
WfA	Weight-for-Age
WGO	Die Wêreld Gesonheids Organisasie
WHO	The World Health Organization
%	Percentage

LIST OF DEFINITIONS

Bottle-feeding:

“The child receives liquid or semi-solid food from a bottle with a nipple/teat.”¹

Breast Milk Substitute:

“Any food or product, being marketed or represented as a partial or total replacement for breast milk whether or not suitable for that purpose.”²

Breastfeeding:

“The child receives breast milk direct from the breast or which has been expressed.”¹



Complementary Feeding:

“The child receives both breast milk and semi-solid or solid food.”¹

Complementary Food:

“Any food given to an infant of six months of age and above, as part of the transitional process during which the infant learns to eat food appropriate for his or her developmental stage whilst continuing to breastfeed as well.”²

Exclusive Breastfeeding:

“The infant receives only breast milk from his or her mother or expressed breast milk, and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines. The infant who receives his or her mother’s expressed breast milk in a cup whilst the mother works outside the home is still deemed to be exclusively breastfed.”²

Formula Feeding:

“The infant receives an infant formula via a bottle or cup.”³

Infant Formula:

“Infant formula is an industrially produced milk product designed for infant consumption. Usually based on either cow or soy milk, infant formula strives to duplicate the nutrient content of natural human breast milk. Since the exact chemical properties of breast milk are still unknown, 'formula' is necessarily an imperfect approximation.”³

Weaning / Introduction of Solids:

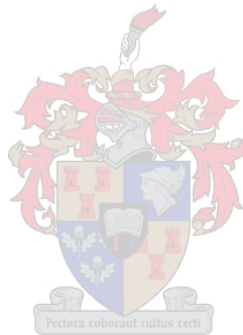
“Process that begins with the introduction into the child’s diet of any food element other than breast milk, including water and teas, and ends with the complete suspension of mother’s milk.”³

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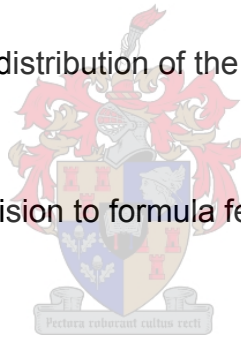
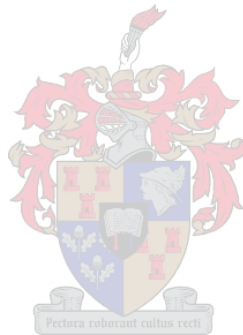


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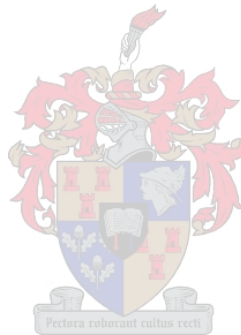
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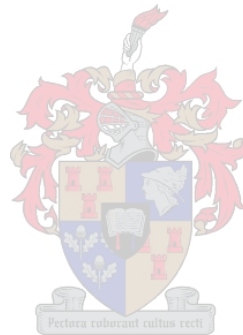


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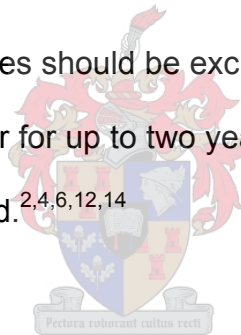


CHAPTER 1: INTRODUCTION AND PROBLEM STATEMENT

1.1 INTRODUCTION

Breastfeeding is a health behaviour that has an immediate and delayed impact on infant morbidity and mortality.⁴ Breastfeeding has a range of benefits for both the mother and her infant, including nutritional, immunological, biochemical, anti-allergic, anti-infective, intellectual, developmental, psychological, psychosocial, economic, and environmental benefits.^{5,6,7,8,9,10,11}

It is recommended that all babies should be exclusively breastfed for at least the first six months of life and thereafter for up to two years of age and beyond, together with appropriate complimentary food.^{2,4,6,12,14}



In South Africa, only 7 percent (%) of children between 0–6 months are exclusively breastfed; while 67% of children younger than 6–9 months are breastfed while also receiving complementary food and 30% of children between 20–23 months are still being breastfed.¹³

The United Nations Children's Fund (UNICEF) estimates that breastfeeding prevents over 6 million deaths per year of children under 12 months. Breastfeeding also has the potential to save another 1.5 to 2 million infants from death each year according to both the World Health Organization (WHO) and UNICEF.^{2,14}

The mother's decision to stop breastfeeding may affect the future health of the infant as well as the development of parenting skills in the mother.^{4,6,15,16} The choice to rather formula feed might thus have far reaching effects for the mother, her infant, the family as well as for the country.¹⁷

"The Baby-Friendly Hospital Initiative" (BFHI), a global campaign, to certify hospitals that comply with the WHO and UNICEF's Ten Steps to Successful Breastfeeding, as baby friendly, was launched in 1989 by UNICEF and WHO to advocate breastfeeding.^{4,6,12}

1.2 PROBLEM STATEMENT

Despite policies on breastfeeding, which have been drawn up and implemented, and the obvious advantages, the low prevalence of exclusive breastfeeding is a cause of concern in South Africa. The South African Demographic Health Survey (SADHS) conducted in 1998 found that in the first 3 months of life, only 10% of infants were exclusively breastfed (Figure 1.1), while the rate of bottle-feeding was 48.3% nationally. In the age group 0–3 months, 17% of infants were never breastfed. Only 2% of children aged 4–6 months were still exclusively breastfed. Mothers with no education had a median exclusive breastfeeding duration of 1.1 months whereas mothers with an education higher than Standard 10, had an exclusive breastfeeding duration of 0.4 months.¹⁸

According to the SADHS, complementary food and breast milk are given to 64% of infants 0-3 months old, and to 76.5% of infants 4-6 months old. The reported use of

bottles with teats is also very common in South Africa. Of non-breastfed infants 0-3 months of age, 45% are given bottles with teats and of breastfed infants 0-3 months of age, 58% receive bottles with teats, and thus these infants were not fed via a cup.¹⁸

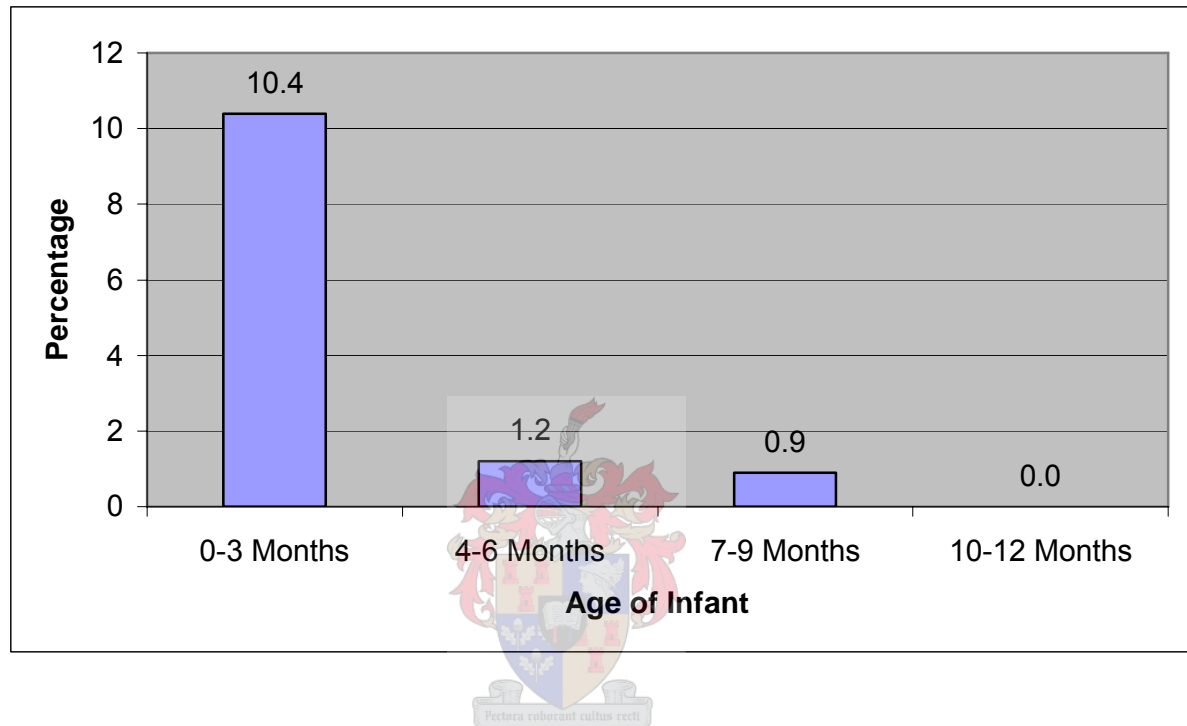


Figure 1.1: The prevalence of exclusive breastfeeding among infants younger than 12 months: SADHS¹⁸

The South African Vitamin A Consultative Group (SAVACG) found that the percentage of infants never breastfed averaged 12% in South Africa while it averaged 24% in the Western Cape.¹⁹

By determining which factors may influence mothers' decisions regarding feeding practices, one can aid in developing strategies to reach the worldwide breastfeeding goals.

1.3 STUDY AIMS

The main aim of the study was therefore to identify factors that influence high socio-economic class mothers' decision regarding infant feeding practices.

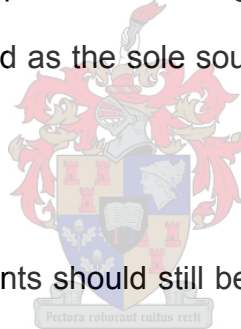
1.4 STUDY OBJECTIVES

- 1.4.1 To identify the reasons why high socio-economic class women decide not to breastfeed.
- 1.4.2 To identify the factors that influence the decision-making process when deciding which infant formula to feed the infant aged 0–6 months of age.
- 1.4.3 To evaluate whether the type and volume of infant formula selected by the mother is appropriate for the infant's needs.

CHAPTER 2: REVIEW OF RELEVANT LITERATURE

2.1 RECOMMENDED INFANT FEEDING PRACTICES: 0-6 MONTHS

Breast milk is widely acknowledged to be the most complete form of nutrition for infants due to the fact that it provides the necessary elements for optimal growth and development.^{5,6,7,12} Breast milk has nutritional, immunological, biochemical, anti-allergic, anti-infective, intellectual, developmental, psychological, psychosocial, economic, and environmental benefits for the mother and infant.^{5,6,7,8,9,10,11} Breastfeeding is therefore the preferred feeding option for all infants and exclusive breastfeeding is thus advocated as the sole source of nutrition for the first 6 months of an infant's life.^{5,6,7,12}



After the age of 6 months, infants should still be breastfed while receiving adequate and appropriate weaning food. Breastfeeding should be continued for as long as it is the mother's wish and it is convenient for her.²⁰

The WHO and UNICEF goals for the year 2000 were that at least 50% of mothers should be exclusively breastfeeding their babies up to at least four months of age. Available data show that unfortunately these breastfeeding goals were not achieved in most countries and thus new objectives were established for the year 2010.⁶

In 1981, the International Code on Marketing Breast Milk Substitutes was devised by the WHO, to protect mothers and health workers from commercial pressure by

breast milk substitute manufacturers (Table 2.1). This was endorsed by the infant formula manufacturers and forbids the provision of free samples of infant formula to mothers, health care workers and health facilities. In 1994 the World Health Assembly passed an additional resolution to ensure that the practice of distributing free gift samples of infant formula through physicians' offices and other health care facilities was also discontinued.²¹

Table 2.1: Ten important provisions of the International Code on Marketing of Breast Milk Substitutes ²¹

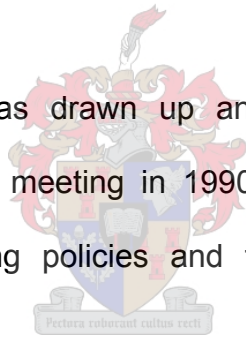
- | |
|--|
| <ol style="list-style-type: none"> 1. No advertising of breast milk substitutes to the public. 2. No free samples of breast milk substitutes or related products to mothers. 3. No promotion of breast milk substitutes or related products in health facilities. 4. No company mother craft nurses to advise mothers. 5. No gifts or personal samples to health care workers. 6. No words or pictures idealizing artificial feeding, including pictures of infants on the labels of the product. 7. Information to health workers must be scientific and factual. 8. All information on artificial feeding, including the labels, should explain the benefits of breastfeeding and the costs and hazards associated with artificial feeding. 9. Unsuitable products, such as sweetened condensed milk, should not be promoted for babies. 10. All breast milk substitute products should be of a high quality and take into account the climatic and storage conditions of the country where they are used. |
|--|

The WHO/UNICEF planned to address the influence of hospitals on breastfeeding practices, in 1989, by issuing a joint statement that described The Ten Steps to Successful Breastfeeding. These steps (Table 2.2) are internationally relevant to both developed and developing countries. It outlines the policies and practices, which should be implemented in hospitals, in order to protect, promote and support breastfeeding.²¹

Table 2.2: The Ten Steps to Successful Breastfeeding²¹

- | |
|---|
| <ol style="list-style-type: none"> 1. Have a written breastfeeding policy that is routinely communicated to all health care staff. 2. Train all health care staff in skills necessary to implement this policy. 3. Inform all pregnant women about the benefits and management of breastfeeding. 4. Help mothers initiate breastfeeding within half an hour of birth. 5. Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants. 6. Give newborn infants no food or drink other than breast milk, unless medically indicated. 7. Practice rooming-in so that mothers and infants can remain together 24 hours a day. 8. Encourage breastfeeding on demand. 9. Give no artificial teats, pacifiers, or soothers to breastfed infants. 10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from hospitals or clinics. |
|---|

The Innocenti Declaration was drawn up and adopted by participants at the WHO/UNICEF policy makers' meeting in 1990. It called for all governments to develop national breastfeeding policies and to set appropriate targets for the 1990s.²¹



In 1991, the WHO/UNICEF Baby Friendly Hospital Initiative, a global initiative and structured method of promoting, protecting, and supporting breastfeeding, was developed. The aim of this strategic program was to combine the essential principles of the International Code, The Ten Steps to Successful Breastfeeding and the Innocenti Declaration.²¹

2.2 BREASTFEEDING

2.2.1 Benefits of breastfeeding to the infant

Breast milk is nutritionally superior to any alternative-feeding product. Its hygienic merits are well established, it is always fresh, available at the correct temperature, contains a variety of anti-infectious factors and immune cells and it is the least allergenic of any infant food.^{8, 22,23}

Breast milk is also species-specific and thus all substitute-feeding preparations differ from breast milk, thus highlighting the fact that breast milk is uniquely superior for human infant feeding.⁹

Breast milk has a relatively low protein content, which is adequate for the optimal growth of the infant but not excessive, thus not leading to an overload of nitrogen to the immature kidney. It contains a high percentage of whey, which is a soft and easily digestible curd. It contains optimal amounts of essential fatty acids, saturated fatty acids, medium-chain triglycerides and cholesterol, which promote the optimal development of the infant's central nervous system. The relatively low sodium content reduces the renal solute load but still ensures that the infant receives the optimal volume on a daily basis. Minerals found in breast milk are of a high bioavailability thus reducing the volume needed from the mother as well as the volume not used by the infant.²⁴

Infants who are breastfed have fewer infections compared to infants who are formula fed, both in developing and developed countries. This is due to the fact that maternal colostrum and breast milk have immunological advantages that protect the infant against respiratory and gastrointestinal diseases. Breast milk provides passive protection and might also have the capacity to directly stimulate the immune function of the infant. To date, the exact mechanisms are still poorly described, but it is likely that the benefits include altered intestinal physiology, microbiology and immunology. “Maternal colostrum and milk promote the maturation of the infant’s developing intestinal epithelium, have immuno-suppressive effects, which may facilitate tolerance induction to harmless food antigens, and antigens which are associated with commensal bacteria thus lowering the risk of developing food-related allergies. Apart from immuno-suppressive effects, breast milk also shows anti-inflammatory activities and has an anti-microbial function”.²⁵

The frequency and duration of respiratory illnesses e.g. wheezing, asthma and upper as well as lower respiratory tract infection are reduced in breastfed infants. In infants’ breastfed for more than 4 months, the incidence of acute and recurrent otitis media is also reduced. If infants were breastfed for a year, the incidence of otitis media was still reduced and the duration of each episode was also significantly reduced compared with infants that were formula fed.^{21,23}

Breastfeeding protects infants against gastroenteritis due to the fact that breast milk has superior bacteriostatic effects on *Escherichia coli* when the iron-binding proteins are not saturated with iron. Furthermore it also provides gradual immunological

independence, especially if it is the sole source of nutrition for the infant's first 6 months of life.²⁶

A reduction in the incidence of gastroenteritis can be found in infants fed breast milk, even in developed countries and in higher socio-economic classes. It has been found that the incidence of diarrhoeal disease is fifty percent lower in infants fed breast milk for 12 months, than infants fed infant formula.²⁷

Breast milk increases gastric emptying and a variety of factors found in breast milk stimulate gastrointestinal growth, motility and also enhances the maturity of the gastrointestinal tract.²⁷

Breastfed infants have lower rates of urinary tract infection due to the fact that oligosaccharides, which are excreted in the urine, prevent bacterial adhesion to the urinary epithelial cells. Host defence proteins, lactoferrin and serum immunoglobulin A (sIgA) might also perform the same function.²⁷

Breast milk also reduces the risk of the infant acquiring a number of acute and chronic diseases. It reduced the incidence and severity of bacteraemia, bacterial meningitis, diarrhoea, botulism and necrotizing enterocolitis.²¹

Breastfed infants are less likely to be overfed and they show good jaw and tooth development.²² It has been shown that children who were breastfed have nearly half the prevalence of obesity than children who were formula fed. The prevalence of obesity is also inversely related to the volume of breast milk received by the infant.²⁷

It has been found that exclusively breastfed infants show a greater gain in length than formula fed infants, especially during the first six months of life.²⁸

There is evidence that breastfeeding may protect the infant against sudden infant death syndrome (SIDS), eczema and chronic diseases such as ischaemic heart disease, atherosclerosis, juvenile onset of diabetes as well as risk markers for diabetes and heart disease, including reduced insulin response, lipoprotein profile and diastolic as well as systolic blood pressure.^{7, 21,23}

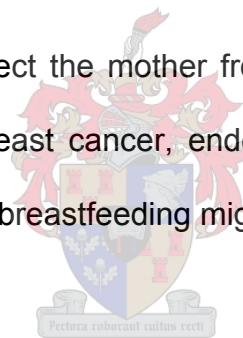
In addition there is also evidence to suggest that breastfeeding may offer some protection against childhood acute lymphoblastic leukaemia, acute myeloblastic leukaemia as well as probable protection against inflammatory bowel disease (Chron's disease and ulcerative colitis) and celiac disease.^{7,21,23}

Infants fed breast milk show greater intellectual and cognitive development and visual functioning than infants fed infant formula.^{6,23} For example, it has been shown that breastfeeding leads to small but detectable improvements in a child's cognitive ability, intelligence and educational achievement as well as language development even after controlling for confounding variables. These cognitive benefits are unlikely to be transitory and it appears to exist until at least young adulthood.^{29,30}

2.2.2 Benefits of breastfeeding to the mother

Breastfeeding does not only improve the infant's health but also improves maternal health. This includes a reduction in postpartum bleeding through uterine involution as a result of the production of prolactin and oxytocin. An earlier return to pre-pregnancy weight, reduced menstrual blood flow and a reduced risk of osteoporosis through improved bone re-mineralization post-partum thus reducing osteoporotic hip fractures in the post menopausal period.^{7,26,27,31} Iron stores are conserved due to prolonged amenorrhea and women with gestational diabetes have a more optimal glucose profile.^{24,32}

Breastfeeding might also protect the mother from developing pre-menopausal and probably post menopausal breast cancer, endometrial cancer and certain ovarian cancers.^{7,23,27,31} The action of breastfeeding might reduce maternal depression.²⁷

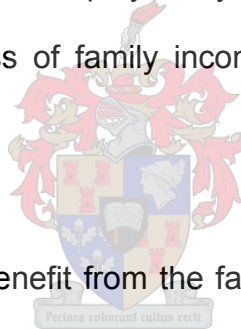


Breastfeeding lessens the economic strain on the mother due to the fact that no infant formula has to be purchased and facilitates bonding between the mother and her infant.^{27,33}

2.2.3 Benefits of breastfeeding to society

In addition to specific health benefits of breastfeeding for the infant and mother, the economy, family, society and environment also benefit from infants being breastfed.

There is a decrease in annual health care cost due to improved health outcomes because these infants show less morbidity and a decreased cost for supplemental programmes. A reduced amount of money is spent on feeding the infant, thus leading to an improvement in household food security and more time and attention is consequently available to siblings and other family matters as a result of decreased time spent on preparing bottles and decreased infant illness. Breastfeeding leads to a reduced cost to the family due to a decreased energy demand for the sterilization of bottles and a decrease in the environmental burden for the disposal of infant formula cans and bottles. A decreased energy demand for both the production and transport of artificial feeding products as well as a lower parental employee absenteeism is shown, increased employee loyalty, improved productivity, enhanced public image and reduced loss of family income due to care attributable to child illness.^{9,21,24,31}



The country and family also benefit from the fact that the exclusively breastfeeding mother might have a delay in menstruation, and ovulation and thus the suppression on fertility. This process thereby aids in increased birth spacing, improving maternal and child health, while also limiting the population growth.^{21,24}

2.2.4 Contra-indications to breastfeeding

Due to medical reasons some mothers may not be able to breastfeed or breastfeeding might not be in the best interest of the infant. In such circumstances, infant formula is indicated.^{26,27}

Breastfeeding is for example contra-indicated in infants with classic galactosemia; mothers who are human T-cell lymphotropic virus type I- or II-positive (HIV type-1 and 2); mothers who are receiving diagnostic or therapeutic radioactive isotopes, have had exposure to radioactive materials for as long as there is radioactivity present in the milk; mothers who are receiving anti-metabolites or chemotherapeutic agents or a small number of other medications until they clear in the milk; mothers who are using drugs of abuse; and mothers who have herpes simplex lesions on the breast, especially the areola.^{9,27}

It has been established that the human immunodeficiency virus (HIV) is transmissible through breast milk.² The highest rate of transmission of the virus can occur *in utero*, during late pregnancy and during delivery. The transmission rate through breastfeeding is estimated to be 8–14%. Factors, which influence this transmission rate, include acquiring the infection during breastfeeding; the length of time that the infant is breastfed; the occurrence of cracked nipples, mastitis, breast abscess and oral or gastrointestinal disease in the infant e.g. oral thrush. Transmission through breastfeeding is also influenced by the stage of the infection of the mother; the presence of symptoms of the HIV infection; signs of opportunistic diseases; a low T-helper cells (CD4) count; high viral load and vitamin A deficiency. The mother should be appropriately counselled regarding the feeding options available for her infant in order to make an informed infant feeding decision.²

The risks of feeding the infant with breast milk substitutes should be carefully balanced and weighed against the risk of the transmission of the virus via breast milk. The Joint United Nations Programme on HIV/AIDS (UNAIDS), WHO and

UNICEF joint statement states that “in all populations, irrespective of HIV infection rates, breastfeeding should continue to be protected, promoted and supported and counselling for women who are aware of their HIV status should include the best available information on the benefits of breastfeeding and the rise of HIV transmission through breastfeeding, and on the risks and possible advantages associated with other methods of infant feeding.”²

2.2.5 Prevalence of breastfeeding

In recent decades the number of young mothers wishing to breastfeed has declined all over the world. The low prevalence and short duration of breastfeeding remains a public concern globally.⁴

The Healthy People 2010 goal is to increase the proportion of mothers who breastfeed in the first three months from 64% in 1998 to 75% by 2010 (Table 2.3).³⁴



Table 2.3: Breastfeeding goals for Healthy People: 1998 baseline percentages and 2010 breastfeeding targets³¹

Objective	Increase in mothers who breastfeed	1998 Baseline (Percentage)	2010 Target (Percentage)
16-19a	In early postpartum period	64%	75%
16-19b	At 6 months	29%	50%
16-19c	At 1 year	16%	25%

It has been shown that exclusive breastfeeding during the first 6 months of an infants life increases the likelihood of continued breastfeeding for at least the first year of life.⁹

According to a study, women in developed countries who initiate and continue to breastfeed their infants, tend to share a number of characteristics. These characteristics include white race, higher socio-economic status, well educated, married, older, non-smoker, not employed outside the home, increased parity, attendance of prenatal classes, have a healthy full-term infant, have friends or family members with breastfeeding experience and have successful previous breastfeeding experience.³⁶

2.3 FORMULA FEEDING



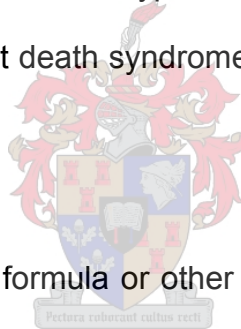
In the 1860's Henri Nestle developed the first infant formula. This was in response to the high mortality rate found among infants housed in orphan homes in Switzerland. The first infant formula was named *Farine Lactee* and consisted of a combination of cow's milk and cereal.³ Since then, numerous possible disadvantages of infant formula feeding have been identified. This includes short term and long-term problems. One should however always keep in mind that it is a mother's right to make an informed decision regarding which infant feeding method she prefers. As the WHO states: "the mother who cannot breastfeed or decides not to do so should not be made to feel guilty."³⁷ Mothers express the need and appreciate confirmation as well as encouragement, especially from health professionals, that they are doing a good job.³⁸

Mothers who choose to formula feed need education, counselling, advice and instructions regarding the correct and appropriate use of infant formula. If she decides to breastfeed and formula feed, she will also need advice on breastfeeding. Thereafter advice is needed on the correct introduction of complementary food.³⁷

2.3.1 Short-term consequences

Problems that are often associated with formula feeding may include late-onset sepsis in premature infants as well as necrotizing enterocolitis, infections such as gastroenteritis, otitis media, respiratory tract infection, bacterial meningitis, bacteraemia, urinary tract infection, hypernatraemia and neonatal tetany. An increased risk for sudden infant death syndrome and some chronic allergic diseases have also been shown.^{9,17,34,36}

The incorrect dilution of infant formula or other fluids given to the infant, places the infant at risk of malnutrition.²²



2.3.2 Long-term consequences

There is an increased risk in older children and adults for type 1 and 2 diabetes mellitus, lymphoma, leukaemia, Hodgkin disease, overweight, obesity, hypercholesterolemia, Chron's disease and asthma.^{9,17,34,36}

Otitis media can occur when the infant sleeps with a bottle in the mouth due to the fact that milk leaks into the ear canal and thus causes ear infection. Tooth

development is disturbed and tooth decay is increased if the teeth are exposed to milk for prolonged periods of time.³³

2.4 RECOMMENDED INFANT FEEDING PRACTICES: INTRODUCTION OF COMPLEMENTARY FOOD

The current recommendation regarding the introduction of complementary food is that it should only be introduced at the earliest age of 4 months, but ideally only at the age of 6 months. This is due to the concern of food sensitivities, growth and development.³⁹

It has been found that the infant is developmentally not ready to process complementary food for swallowing before the age of 4 months due to the extrusion reflex and neuromotor immaturity. The kidneys are also unable to handle large amounts of protein and electrolytes and the intestinal tract has not developed its defence mechanism needed to digest foreign food antigens. Phytic acid found in vegetables and fibre found in certain weaning food can decrease the bioavailability of calcium, iron and zinc. A diverse complementary food diet introduced during the first months can thus exert an inhibitory effect on iron and other essential nutrient absorption.⁴⁰

From the age of about 6 months, the introduction of iron-rich complementary food are however of cardinal importance, especially for the breastfed infant. A formula fed infant might still receive enough iron at this stage, if an iron-fortified infant formula is used. Infant formulas need to have a higher content of iron than breast

milk, due to the lower bioavailability of iron in infant formula. Dietary iron is needed to prevent iron deficiency and iron deficiency anaemia as well as to support cognitive and motor development.^{22,41}

The early introduction of complementary food can lead to excessive weight gain, increased risk for infections and allergies and a reduced volume of breast milk that the infant can consume.²⁸

One study in the United Kingdom (UK) has shown that 2% of babies are given complementary food by 4 weeks of age, 13% by 8 weeks, 56% by 3 months and 91% by 4 months. They found that higher birth weight, lower social class of the husband or partner and maternal smoking habits were associated with the earlier introduction of solid food. The main reasons mothers gave for the early introduction of complementary food were that the infant was not satisfied with milk feeds, he/she does not sleep through the night and thus the introduction of complementary food was thought to be necessary to satisfy the infant. The researchers found that the mother discussed weaning with a range of people including the wider family and friends. Their development of beliefs related to weaning were also influenced by other factors such as their personal experience, health professionals, written lay as well as professional communications.⁴²

Another study conducted in the United States of America (USA) found that among white, middle/upper income class, educated mothers, the mean age for the introduction of cereal was 3.8 months. Exclusively formula feeding mothers introduced cereal earlier at a mean age of 3.2 months, whereas breastfeeding and

combination breast/formula feeding mothers introduced cereal at a mean age of 4.6 and 4.1 months respectively. Furthermore fruit, juice and vegetables were added at a mean age of approximately 5 months. Mothers with the following characteristics introduced cereal at an earlier age to their infants: mothers who formula fed their infants, were first-time mothers, were employed and did not have four-year degrees.³⁹ Women who resumed daily smoking were almost four times more likely to wean their infants early than women who abstained from smoking or who smoked occasionally.³⁶

A previous study conducted in the Cape Metropole on low socio-economic mothers, found that by the age of 3 months, more than half of the infants already started consuming porridge and by the age of 4 – 5 months almost all of the infants started eating porridge, while almost half of the infants had started consuming vegetables and fruit. In this study the age of the introduction of complementary food to the infant was not affected by either the level of education or annual household income of the mother.⁴³

2.5 FACTORS INFLUENCING THE DECISION REGARDING AN INFANT FEEDING METHOD

A mother's decision to breastfeed or formula feed her infant results from the complex interaction of maternal and paternal education, attitudes regarding breastfeeding, social attitudes (e.g. social class, marital status), social support (e.g. public facilities for breastfeeding and environmental factors conducive to breastfeeding), cultural influences (e.g. ethnic background and religion), economic influences (e.g.

employment and employment support), family dynamics (e.g. husband involvement, husbands' attitude towards breastfeeding, mother-infant bonding, family support), hospital influences (e.g. birth trauma, short stay in hospital after delivery), media influences (e.g. advertisements), personal considerations and perceptions, confidence in breastfeeding as well as the standards and content of advice given to mothers by health workers in the hospital, clinical and private setting (Figure 2.1).

4,6,8,15,16,44,45

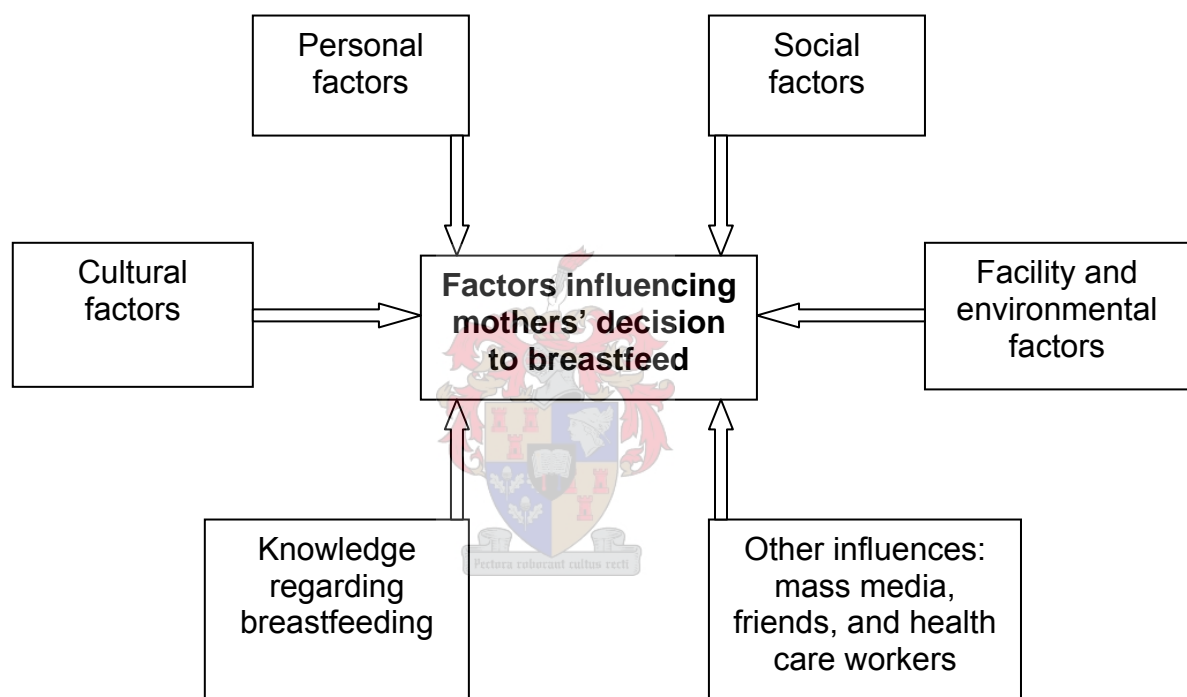


Figure 2.1: Conceptual framework of factors that affect a mothers' choice of infant feeding practices ⁴

2.5.1 Personal factors

2.5.1.1 Timing of decision-making

It has been reported that the intention to breastfeed prenatally is a strong predictor of breastfeeding initiation among mothers.⁴⁶ A study conducted in the USA found that mothers who decided on an infant feeding method before pregnancy, were 3 times more likely to initiate breastfeeding than women who decided on an infant feeding method during or after pregnancy.⁴⁷

In various studies it was shown that mothers decide on an infant feeding method either before, during or after pregnancy (Table 2.4).^{5,48,49,50}

Table 2.4: Time period in which mothers reported choosing an infant feeding method



Time period:	Percentage of mothers that have made a decision:
Before pregnancy	50–80% ^{48,49} 63% ⁵ 43% ¹⁶
Before the end of the 2 nd trimester	85-92% ⁵⁰
During pregnancy	26% ⁵ 34% ⁶⁴
After delivery	11% ⁵ 22% ⁶⁴

In the USA it was found that only 5–7% of mothers were undecided when reaching the third trimester and that 96–97% of mothers fed their infants as they previously

planned.⁵⁰ Other researchers also found that the timing of decision-making, depended upon whether the mother was a primipara or multipara – 73% of multiparas made the decision prior to becoming pregnant compared with 42% of primiparas while only 6% of multiparas and 21% of primiparas made feeding decisions after delivery.⁵

Unfortunately, prenatal classes on infant feeding methods are, however only taught in later months of pregnancy when most mothers have reportedly already made an infant feeding decision.⁴⁸

2.5.1.2 Current perceptions of breastfeeding

Historically breastfeeding was once perceived as an ordinary event within societies, but this is not the case anymore.¹⁰ Some women might consider breastfeeding as being old-fashioned and feel that formula feeding would be more convenient.³²

Women currently have very little visual experience of breastfeeding and that influences both the initiation and the duration of breastfeeding. Many women express feelings of embarrassment, shame, modesty and disgust about breastfeeding in front of others.^{10,36} A study performed in the USA for example showed that mothers who formula fed felt that the barriers to breastfeeding such as social embarrassment and inconvenience outweighed the nutritional benefits of breast milk. They concluded that the reason most often given for formula feeding is to avoid the embarrassment of breastfeeding in public places.¹⁶

It has also been seen that the feeding method, which a new mother decides on, significantly correlates with the way in which the mother herself was fed.^{17,49}

2.5.1.3 Personal factors influencing breastfeeding

In a study conducted in Hong Kong, it was found that personal factors are important in a woman's decision to breastfeed. Almost all (96.1%) of the mothers agreed that breastfeeding makes them feel closer to their babies. A high percentage of mothers (76%) felt that breastfeeding would make them feel important, however only 60% of these mothers breastfed their infants. The majority of mothers (70%) felt that they would feel embarrassed if someone saw them breastfeeding, and more than half (67.9%) perceived insufficient breast milk as a barrier to breastfeeding. Many mothers changed their infant feeding decisions after birth and 50% of these mothers agreed that the physical pain and discomfort associated with breastfeeding discouraged them from continued breastfeeding.⁴

Certain other practices that reportedly also negatively influence breastfeeding duration include maternal smoking, conflicting responsibilities or schedules, lack of knowledge, lack of confidence, negative attitudes towards breastfeeding, convenience of formula feeding, negative breastfeeding experiences, health or medical reasons, mothers returning to work early due to a reduction in the availability of maternity leave and thus making use of child care.^{8,24,47,51,52}

2.5.1.4 Physical factors influencing breastfeeding

A study conducted in Argentina found that the mother's nipple condition and her infant suckling technique were positively related to the duration of exclusive breastfeeding. These two conditions appeared to be among the main difficulties mothers experience, especially among the first few days postpartum.⁶ The other conditions were a sleepy infant, leaking breasts, infant spitting up and the mother feeling sad.^{6,36}

Researchers have found a significant association between the use of dummies, the incidence of sore and cracked nipples, and the short duration of breastfeeding; a significant association between nipple problems after delivery and the early discontinuation of breastfeeding as well as a very close relationship between suckling technique and the early discontinuation of breastfeeding.⁶ This correlates with reasons mothers give for discontinuing breastfeeding, namely a perceived insufficient milk supply, difficulty with the infant latch-on or suckling, lack of comfort or synchrony, degree of inconvenience and sore nipples or breast pain.⁴⁷

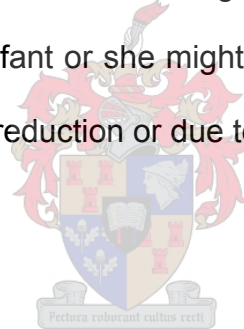
The use of a dummy can affect a baby's sucking technique, making successful breastfeeding more difficult and thus leads to the early cessation of breastfeeding. It was found that the use of a dummy was more prevalent in mothers from a lower social class who had a larger number of older siblings and was younger.³⁰

The postponement of the introduction of an infant formula as well as the tendency of the infant to sleep with the mother increases the duration of breastfeeding. A

demand feeding schedule as well as an increased frequency of breastfeeds per 24 hours might also contribute to this.¹¹

It has been suggested that problems associated with breastfeeding, can be prevented or easily managed by prenatal education, anticipatory guidance and early knowledgeable support from both the family and health care providers. Therefore the early detection of and appropriate education about potential breastfeeding problems can have positive influences on feeding outcomes.⁴

Lactation can become a psychosexual problem as the mother thinks breastfeeding will affect her figure or breasts. A woman might also think that her breasts are too small to provide milk for her infant or she might choose not to breastfeed if she has inverted nipples, had a breast reduction or due to the discomfort of milk leaking.²⁶



2.5.2 Social factors

2.5.2.1 Factors discouraging breastfeeding

Even after making a decision to breastfeed, many mothers fail to reach their own breastfeeding goals because many factors discourage them and lead to an earlier than planned cessation of breastfeeding.⁴⁶ For example the use of an infant formula is negatively associated with breastfeeding outcomes and the delayed inclusion of infant formula is positively correlated with lactation duration.⁴⁷

Some other factors include a lack of family support, a lack of health professional support, inconsistent education and information about breastfeeding, incorrect breastfeeding techniques, lack of confidence and high social demands being placed on the new mother.^{6,8,15,46}

Breastfeeding experience of family and friends also play an important role in the mothers' decision-making process.²⁶ Breastfeeding experience of the mother also influences her decision on infant feeding i.e. mothers who had previous difficulties like dorso-lumbar fatigue after feeding, sore nipples, painful engorgement or appalling experiences with breastfeeding might subsequently decide to rather formula feed.²⁶

2.5.2.2 Social support



In the UK it was found that the attitudes as well as the advice offered by various individuals in the social network of the mother exert an influence on her infant feeding decision.^{8,15} The new mother's own mother and her partner have been shown to be independently associated with the incidence as well as the duration of breastfeeding.¹⁵ It has been suggested that parental attitudes might provide a much greater potential as intervention targets than most demographic factors which are difficult to change.¹⁵

In Hong Kong, most mothers (62.6%) agreed that successful breastfeeding depends on your social support network. More than half of the mothers (54.3%) felt that breastfeeding causes the mother to be socially tied down.⁴ Some breastfeeding

mothers thus supplement their infants' breast milk intake with formula milk to allow the mothers more flexibility in feeding their infants and it helps them feel that they are giving adequate nourishment to their infants.¹⁶

The social support network may provide one mechanism for obtaining the knowledge and confidence associated with successful breastfeeding. Sources of support may however vary according to the women's age, social class, ethnic group or culture.⁸

Major barriers to breastfeeding are misinformation and the lack of role models. It has been shown that an experienced mother can be an enormous help for first-time breastfeeding mothers.³³

2.5.2.3 Socio-economic status



Literature has revealed the importance of socio-economic status on breastfeeding. The socio-economic status was usually measured by using various components, including household income, occupation, level of education and/or marital status.⁵

Research conducted in the USA and South Africa found that breastfeeding mothers overall were more likely to be married, affluent, of a higher social status, older, employed, demonstrated good health habits and had better prenatal care. The infants tended to show a higher birth weight and birth height.^{5,49,53,54} The fathers of the breastfed infants were also more likely to be employed and better educated.⁵

2.5.2.4 Social class

Mothers belonging to a higher social class and thus higher socio-economic status generally show a positive association with breastfeeding initiation and duration in developed countries.^{36,55,56} Developing countries might however show a reverse relationship.³⁶

Matich and Sims identified that husbands of middle class women influenced their partner's decision to breastfeed most, whereas in low class women, their mothers had the most influence.⁸

2.5.2.5 Education of the mother

In South Africa there is a tendency for better-educated mothers not to breastfeed their children and a negative correlation exist between the breastfeeding frequency and the educational level of the mother. Thus mothers with no education or a low level of education, breastfeed more frequently than mothers with a higher education.¹⁸

In the demographic and health survey conducted in South Africa in 1998, it was found that 92.1% of mothers with an education between grade 1 - 3 breastfed their children, while 84.4% of mothers who obtained Grade 12 and 80.5% of mothers with a tertiary education, ever breastfed their infant. Mothers with a tertiary education were also found to have a considerably shorter (6.5 months) median duration of breastfeeding than mothers with a secondary education and lower.¹⁸

One however needs to take annual household income into consideration when analysing the effect of the mother's education, as mothers in low-income households tend to rather breastfeed due to the reduced cost.³⁵

In contrast a study conducted in Argentina found that the level of maternal education significantly relates to the current duration of exclusive breastfeeding. Mothers with secondary or tertiary level education had significantly longer durations of exclusive breastfeeding than mothers with only primary education and had a higher exclusive breastfeeding rate at six months.⁶

The National Centre for Chronic Disease Prevention and Health Promotion (CDC) found that college-educated women and women aged 35 years and older were more likely to breastfeed their infants.³¹



2.5.2.6 Employment

Not only the income of the family, but also the mother's ability to breastfeed is affected by the employment status of the mother. Employed mothers show a shorter duration of breastfeeding than non-employed mothers. The mothers' perception of how difficult it would be to continue breastfeeding when returning to work seemed to be the most important variable in predicting the duration of breastfeeding.⁵⁷

Researchers in the USA found that breastfeeding mothers were more likely to have been employed prior to or during their pregnancy and the fathers of breastfed infants

were also more likely to be full-time employed. The income levels among those employed did not differ between the two groups.⁵

2.5.2.7 Maternal age

It has been shown that breastfeeding rates are lowest for women under the age of 20 and that breastfeeding initiation and duration are higher for women older than 25.^{5,36,57} Younger, unmarried mothers who experience poverty are strongly affected by their socio-economic peers, and more frequently choose formula feeding, compared to well-supported, better education mothers who plan their pregnancies.⁴⁴

2.5.2.8 Marital status

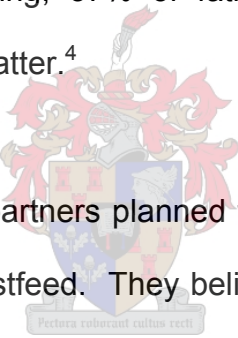
Marriage might have a positive effect on breastfeeding whereas the presence of other adult women in the home has a negative effect.⁴⁹ Previous research has for example demonstrated that married women are more likely to breastfeed their infants than single woman. The reasons being that fathers participate in and influence the choice of breastfeeding or formula feeding their infant.¹⁵

Breastfeeding mothers in the USA were more likely to be married and both breastfeeding mothers and fathers had more years of formal education.⁵

2.5.2.9 Fathers' influence on breastfeeding

Fathers have an important role in encouraging their partners to breastfeed - when fathers are more supportive of breastfeeding, mothers are more likely to choose breastfeeding and for a longer period of time.^{8,17,32,36,58} One example is by acting as a key support or restraint to breastfeeding.¹⁵

The majority of mothers (79.5%) in Hong Kong strongly agreed or agreed that encouragement and support in breastfeeding from their husbands were important to them. It was found that 42.4% of fathers preferred breastfeeding for their infant, 14.3% preferred formula feeding, 37% of fathers had no opinion and 6.1% of couples never discussed the matter.⁴



Most of those fathers, whose partners planned to breastfeed their infant, supported their partners' decision to breastfeed. They believed that breastfeeding is better for the baby, agreed that it helps with infant bonding and protect the infant from disease. The husbands were also more likely to want their partners to breastfeed and had respect for breastfeeding women. Fathers whose partners planned to formula feed their infant believed that breastfeeding is bad for the breasts, would make the breasts ugly and would also interfere with their sexual relationship.^{32,59}

Many fathers anticipate before birth that breastfeeding would be convenient. After birth some fathers however experience breastfeeding differently. They feel a lack of opportunity to develop a relationship with the infant, thus feeling inadequate and

separated from the mother and infant. Breastfeeding might, in these situations, be seen as a barrier towards building their own relationship with their infant.⁵⁸

2.5.3 Facility and environmental factors

2.5.3.1 Type of birth

Epidural anaesthesia during labour might inhibit breastfeeding due to the adverse effects of the narcotic and the epidural analgesia on certain neurobehavioral parameters of the infant (e.g. lower scores on muscle strength, tone and rooting, but not on sucking). General anaesthesia might even have a greater inhibitory effect than epidural anaesthesia on breastfeeding. There is a strong association between epidural anaesthesia use and infant formula supplementation due to not having an immediate breastfeeding encounter.³⁴ A study conducted in the UK showed that some mothers who had originally wanted to breastfeed might not have done so due to events associated with the birth of the infant e.g. Caesarean section and ill health of the baby.⁴⁴ Women who experience less complications during pregnancy and birth may feel more physically and psychologically prepared to breastfeed their infant.⁸

2.5.3.2 Hospital practices

Known hospital practices that might lead to the cessation of breastfeeding include infant formula given during the early postpartum period, transferring an infant to a nursery soon after delivery (thus no rooming-in is practiced which interferes with the

new mother's ability to learn and respond positively to her baby's feeding cues), scheduled feeding, supplementing breastfeeding with infant formula or water and the usage of dummies and milk bottles.^{46,60} It has been shown that free commercial discharge infant formula might also discourage breastfeeding.⁶⁰

A study conducted in the USA found that providing the mother with a manual breast pump among the items in the discharge gift pack decreased the likelihood of supplementing with infant formula but had no influence on the duration of breastfeeding.⁴⁶ Women not rooming-in with their infants, were three times more likely to discontinue breastfeeding.³⁶

Hospital routines can promote breastfeeding success through the education and training of health care workers, extensive rooming-in, early placement of the newborn to the breast, no supplemental infant formula in the nursery, banning the use of dummies, bottles and by withholding infant formula gift packs and coupons.³⁴

The WHO/UNICEF Baby Friendly Hospital Initiative addresses all these factors (Table 2.1).⁴⁶

2.5.3.3 Facilities to breastfeed

The lack of facilities for breastfeeding in public places and at work has often been recognized as a barrier to breastfeeding. In Hong Kong it was found that 88.2% of mothers agreed that the lack of privacy for breastfeeding in public places was a barrier to breastfeeding.⁴

2.5.4 Knowledge regarding breastfeeding

2.5.4.1 Knowledge of breastfeeding

Both mothers and fathers of breastfed infants in the UK appear to have more knowledge about the nutritional superiority and health benefits of breast milk, compared to the parents of formula fed infants. Thus the decision to rather formula feed may be at least partly due to a lack of awareness of the benefits of breastfeeding.¹⁵ Research has thus shown that there is a relationship between knowledge about breastfeeding and parents' attitude towards it.⁵⁸ Educating fathers can lead to a change in attitude and a promotion of breastfeeding.^{32,59}

It was found in Hong Kong that 66.9% of both breastfeeding and formula feeding mothers agreed that they did not know enough about breastfeeding. Of the formula feeding mothers, 67% agreed that if they had known more about breastfeeding, they would have chosen that method.⁴

As discussed before, fathers often participate in choosing the feeding method for their newborns, and influence the mother's decision regarding infant feeding practices. They are however often not included in most breastfeeding education programmes.⁵⁹ Husbands, and thus future fathers should be included together with future mothers in educational efforts.³⁵ Fathers should be informed regarding the benefits of breastfeeding as well as the risks of using infant formula.⁵⁸ Antenatal classes also should not only concentrate on the physical preparation of breastfeeding, but on the emotional and social aspects as well.¹⁷

2.5.4.2 Potential barriers associated with breastfeeding

It has been found that for a large number of mothers who wanted to breastfeed, it was a common and frustrating occurrence to have their prenatal risk factors go unnoticed and not discussed until after birth. Researchers concluded that one has to address both the lack of knowledge and social support, to enable women to optimise their breastfeeding goals. One of the main elements to address this is the empowerment of women to breastfeed by giving her sufficient knowledge to make an informed decision. Women with higher breastfeeding knowledge usually make a choice to breastfeed and their success rate is also higher.⁴

2.5.4.3 Misconceptions regarding breastfeeding

It was found that mothers who formula fed their infants were more likely to agree with the statements that a mother who occasionally drinks alcohol should not breastfeed and that a mother who smokes should not breastfeed. The Canadian Paediatric Society (1998) however states that occasional alcohol intake should not preclude breastfeeding and that, even if a mother continues to smoke, breastfeeding is still the best choice.¹⁵

In a study conducted in the USA where mothers were formula feeding, it was found that they were reassured that their babies were getting enough milk because they could measure the volume of infant formula given and they could measure weight gain whereas breastfeeding mothers can only rely on adequate weight gain, except if they fed expressed breast milk. It was shown that most families view infants that

gain weight appropriately and sleep through the night as being well nourished and satisfied. Mothers who do not breastfeed their children generally tend to introduce complementary food earlier to their children, use a bottle to give the complementary food and view sleeping through the night as a major priority for the feeding method chosen.¹⁶

2.5.5 Cultural factors

2.5.5.1 Ethnicity and culture

It has been shown that ethnicity plays a major role in influencing the decision to breastfeed for example, breastfeeding might not be accepted as the social norm in some demographic groups.^{5,24} It has been shown that the decision to breastfeed or formula feed the infant, are rooted in the context of ethnic beliefs as well as cultural beliefs. Culturally based feeding beliefs among different ethnic groups thus influence how an individual mother makes her infant feeding method decision. It has been found that mothers who immigrate to another culture and geographic region where practices are different change their beliefs.⁶¹

Factors influencing a mother's decision to breastfeed include a woman's perceptions and attitudes, work intentions, influence of friends and family, knowledge base and support by health care workers. A women's social context as well as her cultural values influenced how these factors are interpreted and determine the degree of support she will receive.⁴⁹

It has been observed in South Africa and the USA that affluent, white women as a group were less likely to breastfeed their infants and for a shorter period of time than black mothers as a group.^{54,62}

In Figure 2.2 one can observe that according to the SADHS study, 89.80% of Asian women have ever breastfed their infants, whereas only 76.00% of White women have ever breastfed their infants in South Africa.¹⁸

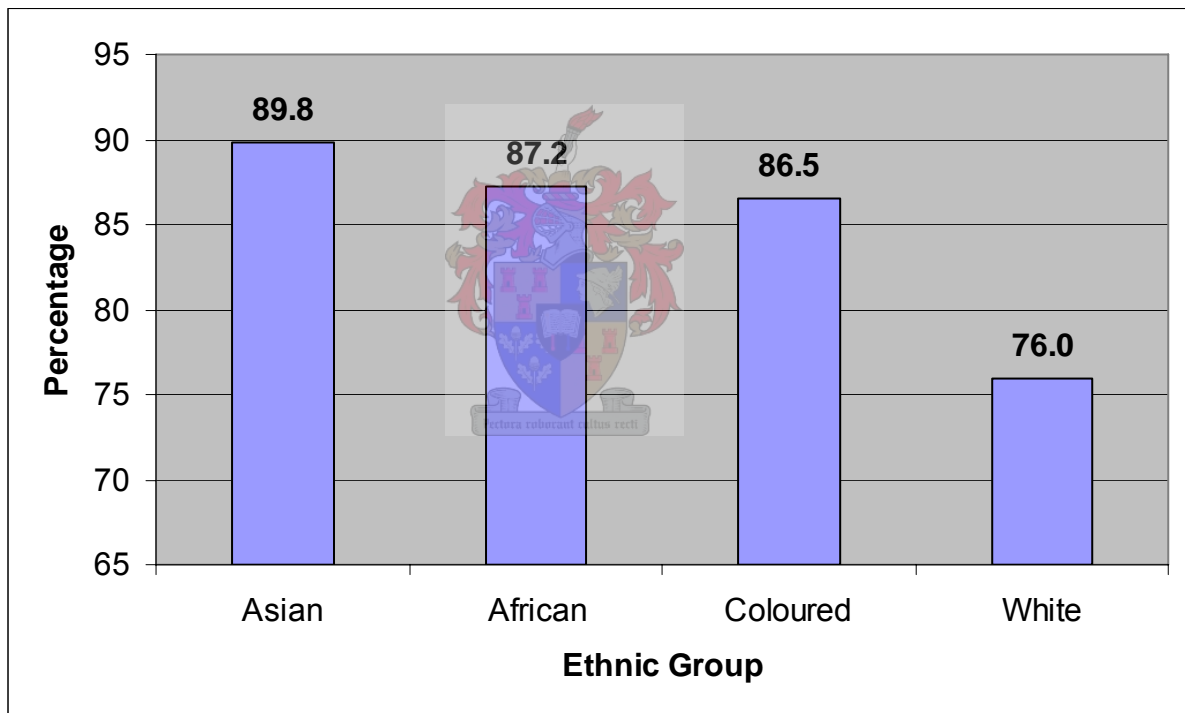


Figure 2.2: Percentage of infants ever breastfed per ethnic group in South Africa according to the SADHS (1998)¹⁸

2.5.5.2 Religion

All religious groups including Islamic, Buddhism, Christianity, Hinduism and Judaism encourage breastfeeding, therefore the religion of the mother should not have a great influence on the breastfeeding intentions of the mother.

2.5.6 Other influences

2.5.6.1 Mass media

It has been shown that the mass media has a strong influence on the public perceptions of health issues. The media can provide information to people but also generate or strengthen ideas about what is common sense or normal. The mass media however does not promote a positive image of breastfeeding, maybe due to a scarcity of acceptance of breastfeeding in public. Formula feeding however is often portrayed as normal and thus the obvious choice.⁶³

The major sources of breastfeeding information in a study conducted in Hong Kong were found to be antenatal talks (47.40%), books and pamphlets (26.50%), relatives and friends (16.50%), doctors (48.70%) and midwives (40.90%).⁴

A previous study conducted in the Cape Metropole reported the most common information sources as the family (26.00%), health care workers (22.00%), the community (8.00%) and the media (20.00%).⁶⁴

Mothers receiving information on infant feeding practices from lay sources tend to formula feed their infants.⁸ It has also been shown that information given about the different infant feeding methods can influence the mothers' decision-making process. Books and pamphlets have been reported as the media information source influencing the mothers' decision most often.⁴⁸

In the USA it was found that mothers discussed feeding methods primarily with their own mothers and other experienced female family members. Mothers who opted for formula feeding obtained most of their information from relatives. Mothers who breastfed their infant, however often had difficulties which could not be solved within their family network.¹⁶

2.5.6.2 Infant formula manufacturers

It has been shown that the manufacturing of infant formula has had a major impact on breastfeeding practices. Due to profits made by companies selling breast milk substitutes, these companies used marketing strategies which targeted pregnant women and new mothers to convince them into rather using breast milk substitutes, thus undermining breastfeeding.²¹ Advertisements of various infant formula manufacturers in the past might have contributed to the misconception that infant formula is just as good as breast milk.¹⁷

The International Code on Marketing Breast Milk Substitutes addresses the influence that infant formula milk manufacturers might have on health care workers and mothers.²¹

2.5.6.3 Health care professionals

It has been found that lactation, which is both a learned behaviour and an automatic physiological process, is most successful in a supportive environment. Health care professionals have a large role to play in providing encouragement and accurate information on breastfeeding. It has been found that women who breastfeed and have received early and repeated information as well as support, breastfed their infants for longer.³²

Help by a lactation consultant during the first few weeks after birth, results in more successful and increased duration of breastfeeding.⁵⁷

In the UK, the three main sources of professional help and advice received by mothers were from antenatal classes, reading and discussions with doctors and nurses. Formula feeding mothers generally received advice from fewer sources, particularly lay, but also professional sources, than breastfeeding mothers.^{17,65}

In the USA, it was concluded that physicians may briefly mention the benefits of breastfeeding, but they spend very little time on the concerns expressed by a mother and her family, regarding barriers to this method.¹⁶ A study conducted in the USA found that many new mothers did not receive positive breastfeeding messages from the healthcare professionals as well as the hospital staff. The mothers who perceived a neutral attitude from the healthcare professionals, only breastfed for the first 6 weeks of the infant's life. This phenomenon was found especially among mothers who prenatally intended to only breastfeed for a short period of time.⁶⁶

Research has shown that healthcare professionals do support breastfeeding but they have not received enough training to recognize problems and thus propose interventions to support breastfeeding. This might lead to improper management of breastfeeding and a clinical bias leaning towards the suggestion of infant formulas when breastfeeding problems arise.¹¹

2.5.6.4 Family and friends

The family rather than the professional's influence is paramount.^{52,67} Mothers have reported that their own mothers, friends and husbands influence their infant feeding practices.⁴⁸ One researcher found that women who cared only a little about what their friends thought were more likely to breastfeed. Women who however either cared very much or didn't care at all about what their friends thought, were more likely to formula feed.⁸

An important strategy for increasing breastfeeding rates is to build the mother's confidence through knowledge and breastfeeding education, especially if it is skill-based or observational. Pregnant women should thus receive accurate breastfeeding information as early as possible in their pregnancy.⁴⁷ The predominance of formula feeding has been attributed to a lack of social support as well as a lack of knowledge and confidence in breastfeeding. It has been stated that successful breastfeeding is not exclusively instinctive in the human, but it depends on learned knowledge gained through observations. Most women state that they have an increased need for advice and assistance during the first week of lactation,

thus the need for early contact and support from health professionals is of cardinal importance.⁸



CHAPTER 3: METHODOLOGY

3.1 STUDY DESIGN

The study was conducted as an observational descriptive study.

3.2 STUDY POPULATION

3.2.1 Selection of sample

Day-care centres, private clinics and private practicing paediatricians serving mainly mothers from the higher socio-economic classes of the Cape Metropole were selected as the target areas to recruit subjects from. A list of all possible day-care centres, private clinics and private practicing paediatricians situated in the Cape Metropole was compiled by contacting the Cape Peninsula Child Minders Association, local municipalities and Medpage respectively. Inclusion criteria for day-care centres specifically were that they accommodated babies less than 6 months of age. Exclusive breastfeeding clinics were excluded from the list of private baby clinics.

The compiled list comprised of 46 day-care centres, 10 private clinics and 67 private practicing paediatricians situated throughout the Cape Metropole (Appendix 1). All day-care centres, private clinics and private practicing paediatricians were contacted to obtain verbal consent to administer the questionnaire to mothers at their facilities.


A total of 29 facilities agreed to participate in the study. A letter of consent was also sent to them (Appendix 2).

3.2.2 Sample size

To obtain a precision of 10% on a 95% confidence interval, a sample size of a minimum of 97 mothers was needed.

Consecutive sampling was used for mothers who complied with the inclusion and exclusion criteria.

3.2.3 Inclusion criteria

- 
- The mother should agree to participate.
 - The mother should have an infant between 0–6 months of age.
 - The mother should be feeding only an infant formula (with or without complementary food) to her infant or could have made a decision to stop breastfeeding and start with infant formula feeding before completing the questionnaire.
 - The mothers' household should have an annual household income before income tax equal to or above R101 652^a.
 - The mother should be capable of understanding, writing and speaking either English or Afrikaans (for practical reasons involving cost and time, no distinction

^a In South Africa there are no clear cut-off values for defining a person as belonging to a high-income group. However both Statistics South Africa and the Unilever Institute of Strategic Marketing recommended this cut-off value.

is purposefully made between cultural groups, as generally those within the higher income groups are conversant in English or Afrikaans as well as their home language).

- The mother should be above 18 years of age.

3.2.4 Exclusion criteria

- Mothers who are exclusively breastfeeding.
- Mothers who are both breastfeeding and feeding an infant formula.
- Mothers of adopted babies.

3.3 DATA COLLECTION

3.3.1 Time of data collection



Data collection was conducted at the consenting facilities throughout their business hours in order to include both working and non-working mothers. Data collection took place from May 2005 to August 2005.

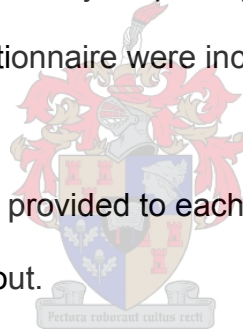
3.3.2 Means of data collection

All the identified day-care centres, private clinics and private practicing paediatricians, which gave verbal consent, were included in the study.

Prior to the commencement of the study, questionnaires and self-addressed, prepaid envelopes were distributed amongst all the participating facilities. The persons administering the questionnaire, usually the receptionist, were trained by the investigator regarding the procedure to administer these documents. While the mother was waiting for her appointment or fetching her infant, she was asked to complete the questionnaire and return it in the sealed envelope to the person administering the forms. Alternatively if she opted to complete it at home, she was asked to post the forms after completion.

Prior to inclusion in the study, the person administering the questionnaire explained the purpose and extent of the study to participants. All suitable participants that voluntarily completed the questionnaire were included in the sample.

In total 10 questionnaires were provided to each consenting institution, thus a total of 290 questionnaires were sent out.



3.3.3 Questionnaire description

Data was collected by means of a self-administered questionnaire that was available both in Afrikaans and English (Appendix 3 and 4) and took approximately 20 minutes to complete. The questionnaire was designed and tested for face and content validity by means of a pilot study that was conducted to test the questionnaire as a research instrument. A letter explaining the purpose of the study was also given to the mothers either in Afrikaans or English (Appendix 5 and 6).

The pilot study was conducted prior to the data collection for the study at a day-care centre, private clinic and private practicing paediatrician in the high socio-economic area of Stellenbosch, which is not in the Cape Metropole. Six mothers who fulfilled the inclusion criteria of the study were asked to complete the questionnaire. Thus two mothers at a day-care centre, two mothers at a private clinic and two mothers at a private practicing paediatrician. Questions misunderstood or answers provided that were not included in the questionnaire were corrected after the pilot study.

The following quantitative and qualitative aspects were covered in the questionnaire:

- Socio-economic and demographic background of the mother.
- Questions related to the mothers' parity, previous infant feeding practices and birth of her youngest infant.
- Questions regarding the general health, birth weight, gestational age at birth, chronological age and current weight of the youngest infant.
- Factors that influenced her decision when deciding not to breastfeed her infant and thus use an infant formula.
- Factors that influenced her decision when deciding which infant formula to use.
- Description of the type and volume of infant formula given to her infant over a 24-hour period.

Both open and closed ended questions were included. A Likert scale comprising four possible answers to statements was used to determine attitude.

3.4 ETHICS AND LEGAL ASPECTS

3.4.1 Ethical approval

The study was approved by the Committee for Human Research, Faculty of Health Sciences, Stellenbosch University [Project Number: N05/02/022] (Appendix 7).

3.4.2 Informed consent

Verbal consent was obtained from each individual before the questionnaire was completed. Voluntary completion of the questionnaire was constituted as sufficient consent to partake in the study.



3.4.3 Participant confidentiality

The participants' identity was protected in that at no point during the completion of the questionnaire were they required to write their names or contact details on the questionnaire. The participant returned the completed questionnaire in a sealed envelope to the person administering the questionnaire, thus ensuring confidentiality. No feedback was given from the receptionist to the investigator regarding which participants took part.

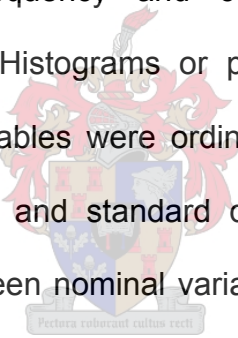
Participant identification information e.g. names, addresses and telephone numbers were omitted from study-related material to ensure participant confidentiality. The participant was ensured verbally that all information provided to the investigator was

regarded as confidential. Information provided to the investigator was only used for the specified study, and was not shared for any other purpose or studies.

3.5 DATA ANALYSIS

Data was captured electronically with Microsoft Excel®, 2003 and controlled for precision of data transfer with regular cross-referencing. The Centre for Statistical Consultation at Stellenbosch University assisted with data analysis using Statistica 7.0®, 2004.

Descriptive statistics like frequency and cumulative frequency tables were constructed for all variables. Histograms or pie charts were constructed for all variables involved. If the variables were ordinal or continuous, means, medians, quartiles, minimum, maximum and standard deviations were calculated. When comparisons were made between nominal variables (i.e. categorical variables) use was made of categorical data analysis.



Analysis of variance (ANOVA) was used to compare continuous variables versus nominal variables. If residuals were non-nominal or if the response variable was ordinal, non-parametric methods were used to compare the non-nominal or ordinal variables versus the nominal variable. When two continuous variables were compared, regression methods were used.

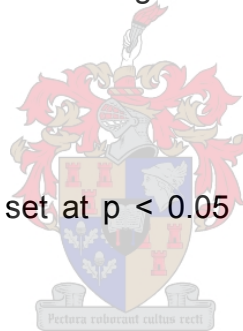
The one-way ANOVA as well as the Kruskal-Wallis Test was applied to determine the correlation between the mother's current employment and the duration of

breastfeeding in weeks as well as the age of introduction of complementary food to her infant in weeks.

The Spearman Correlation Coefficient Test was applied to determine the correlation between the annual household income before tax and the duration of breastfeeding in weeks as well as the age of introduction of complementary food to her infant in weeks.

The Spearman Correlation Coefficient Test was also applied to determine the correlation between the mothers' current age in years and the duration of breastfeeding in weeks as well as the age of introduction of complementary food to her infant in weeks.

The level of significance was set at $p < 0.05$ and applied to all above-mentioned tests.

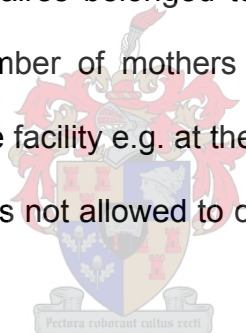


The Centre for Disease Control and Prevention 2000, percentiles for the USA were used as reference to interpret the current weight for age distribution of the study population.⁷²

CHAPTER 4: RESULTS

Verbal consent was obtained from 24 day-care centres, 5 private clinics and 0 private practicing paediatricians situated throughout the Cape Metropole for inclusion in the study. There was thus a 48% fall out rate for day-care centres, 50% for private clinics and 100% for paediatric practices.

In the 3 months of data collection 59 questionnaires of the 290 that were sent out were returned, of which 55 (18.97%) could be used. Two questionnaires were incomplete and two questionnaires belonged to adopted babies. During the data collection period, a small number of mothers were approached to complete the questionnaire at more than one facility e.g. at the clinic and at the day-care centre, in these instances the mother was not allowed to complete the questionnaire a second time around.



4.1 SOCIO-DEMOGRAPHIC INFORMATION OF THE MOTHERS

The number (n) and percentage (%) of respondents in each variable category regarding age, ethnic group, highest education obtained, current employment, annual household income, marital status and number of children is indicated in Table 4.1.

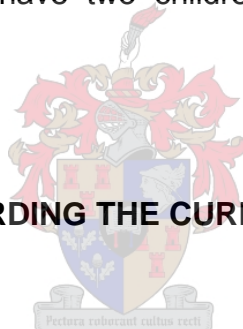
Table 4.1: Socio-demographic characteristics of the participating mothers
(n = 55)

Variable	n	%
Age: (Years)		
20 – 25	5	9.09
26 – 30	18	32.73
31 – 35	20	36.36
36 – 40	12	21.82
Ethnic group:		
African	1	1.82
Coloured	8	14.55
Indian	1	1.82
White	45	81.81
Highest education obtained:		
Grade 12	11	20.00
Diploma / Certificate	21	38.18
Degree	11	20.00
Postgraduate Qualification	12	21.82
Current employment:		
Full-time Job	35	63.64
Part-time Job	2	3.63
Homemaker	12	21.82
Student	0	0
Unemployed	0	0
Self-employed	6	10.91
Annual household income (Before tax): (Rand)		
101 652 - 138 792	13	23.64
138 792 - 233 788	15	27.27
223 788 and above	27	49.09
Marital status:		
Single	2	3.63
Married	49	89.10
Cohabiting	3	5.45
Separated	1	1.82
Widowed	0	0
Number of children:		
One	31	56.36
Two	22	40.00
Three	2	3.64

The current age of the mothers ranged from 20 – 39 years with a median of 31 years, a mean of 31.38 years (\pm 4.32). Fifty (90.91%) of the mothers were 26 years or older and the majority (45; 81.81%) were white.

Eleven (20.00%) of the mothers obtained a secondary education only, whereas most of the mothers obtained a tertiary education. Thirty-seven (67.27%) have either half- or full-day employment and 12 of the mothers (21.82%) are homemakers. Twenty-seven, thus almost half (49.09%) of the mothers belong to a family with an annual, before tax, household income of R223 788 and above. Forty-nine, thus nearly all of the mothers, were married (89.10%) and 31 mothers (56.36%) only have one child each, whereas 22 (40.00%) have two children and only 2 (3.64%) have three children.

4.2 INFORMATION REGARDING THE CURRENT (YOUNGEST) INFANT



The number (n) and percentage (%) of respondents in each variable category regarding gender, gestational age at birth, chronological age, birth weight, current weight, weight distribution, type of birth and medical problems since birth are indicated in Table 4.2.

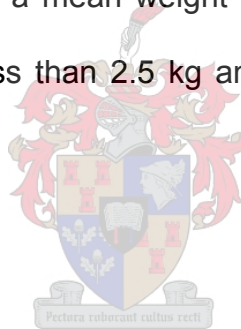
Table 4.2: Characteristics of the infants (n = 55)

Variable	n	%
Gender:		
Male	29	52.73
Female	26	47.27
Gestational age at birth: (Weeks)		
< 30	1	1.82
30 – 35	2	3.64
36 – 40	46	83.63
> 40	6	10.91
Chronological age: (Weeks)		
0 – 4	3	5.45
5 – 8	1	1.82
9 – 12	8	14.55
13 – 16	6	10.91
17 – 20	12	21.82
21 – 24	25	45.45
Birth weight: (Kilogram)		
< 2.50	1	1.82
2.50 – 3.00	9	16.36
3.10 – 3.50	27	49.10
3.60 – 4.00	14	25.45
> 4.00	4	7.27
Current Weight distribution (WfA): (Percentile)		
< 5 th	2	3.64
5 – 10	9	16.36
10 – 25	11	20.00
25 – 50	13	23.64
50 – 75	15	27.27
75 – 90	4	7.27
90 – 95	1	1.82
> 95 th	0	0
Type of birth:		
Normal Vaginal	20	36.36
Caesarean Section	35	63.64
Medical problems since birth:		
Yes	15	27.27
No	40	72.73

The gender distribution of this sample was almost equal between male – 29 infants (52.73%) and female – 26 infants (47.27%). The gestational age at birth of the infants ranged from 24-42 weeks with a median of 39 weeks and a mean gestational age of 38.59 weeks (± 2.80). The majority of infants were aged 36-40 weeks.

The current age of the infants ranged from 2–24 weeks, with a median of 20 weeks and a mean age of 18.24 weeks (± 6.22). Twelve of the infants (21.82%) belonged to the 0–12 weeks chronological age grouping.

The birth weight of the infants ranged between 2.40–4.10 kg (kilogram), with a median weight of 3.40 kg and a mean weight of 3.38 kg (± 0.42). Only one child (1.82%) had a birth weight less than 2.5 kg and four children (7.27%) had a birth weight more than 4.0 kg.



Only two children had a current WfA less than 5th percentile, and were therefore classified as being underweight. None of the children had a current WfA more than 95th percentile, and thus no infant could be classified as being overweight (Figure 4.1).

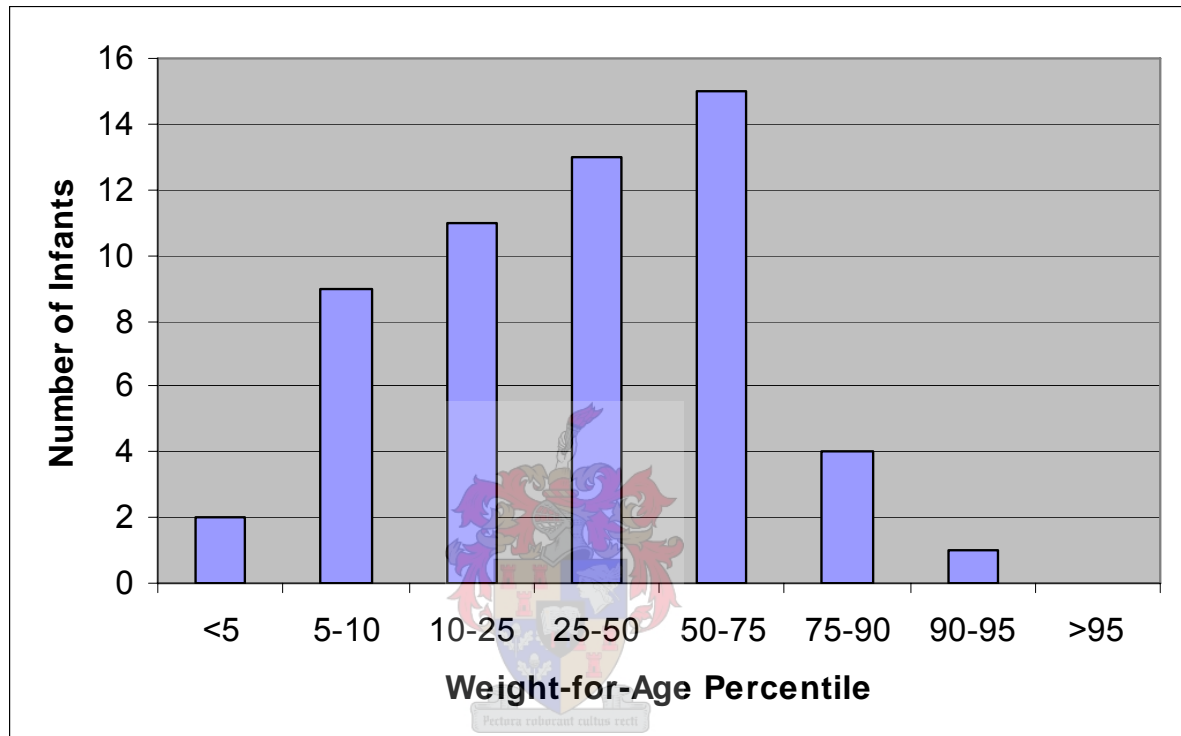
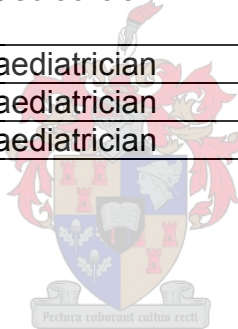


Figure 4.1: The current WfA distribution of the infants (n = 55)

More mothers (35; 63.64%) gave birth by means of a caesarean section than by means of a normal, vaginal birth. Fifteen infants (27.27%) were reported to have experienced problems since birth. Six (10.91%) of these mothers received medical advice regarding feeding practices for this medical condition – two received advice from the general practitioner, and four from the paediatrician (Table 4.3).

Table 4.3: Feeding advice given to the mothers

Medical condition:	Advice given by:	Advice given:
Lactose intolerance	General Practitioner	Feed infant soymilk
Reflux	General Practitioner	Change the infant formula
Not picking up weight sufficiently	Paediatrician	Give 3 hourly feeds
Otitis media	Paediatrician	Feed child sitting up
Eczema	Paediatrician	Feed infant soymilk
Premature infant	Paediatrician	Feed infant formula



4.3 FEEDING PRACTICES

4.3.1 Current (youngest) child

4.3.1.1 Timing of decision-making

Forty-four mothers (80.00%) reported that they only decided after the birth of their infant that they were going to formula feed their infant (Figure 4.2).

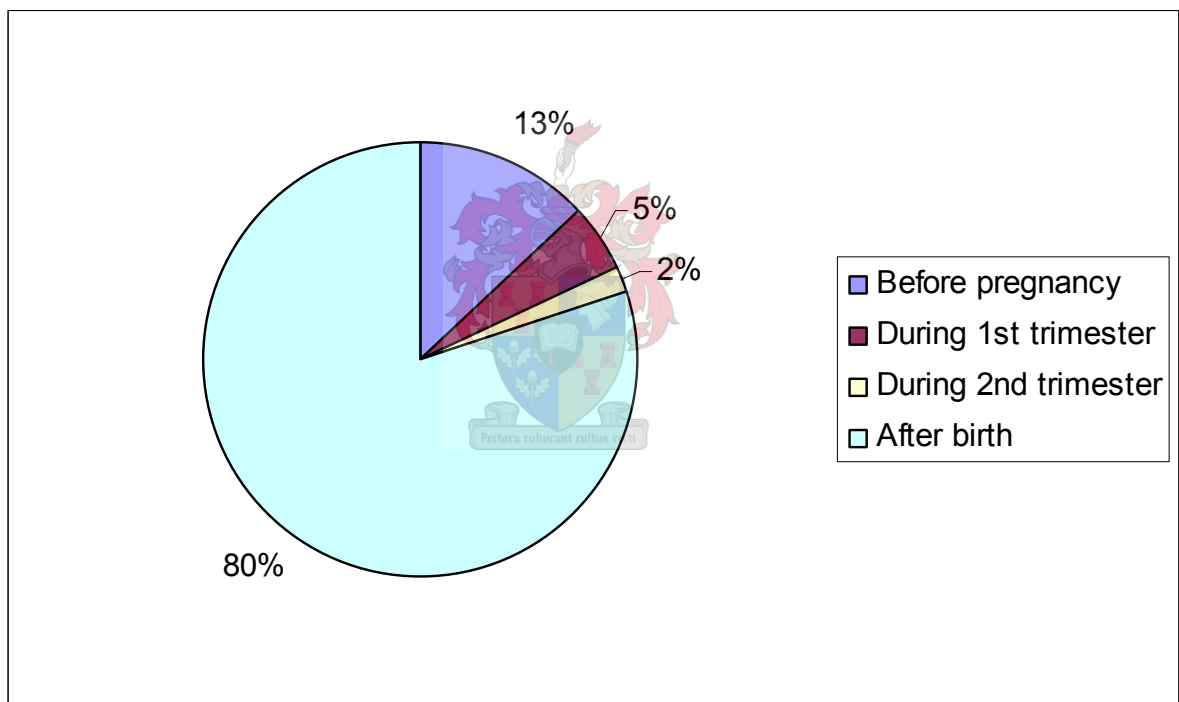


Figure 4.2: Timing of the decision to formula feed the infant (n = 55)

4.3.1.2 Age of infant when formula feeding was introduced

Twenty-four (43.64%) of the mothers reported introducing infant formula in the first month of life (Figure 4.3). The age at which infant formula was introduced to the infant ranged from 0–23 weeks, with a median age of 6 weeks and a mean age of 7.27 weeks (± 6.92).

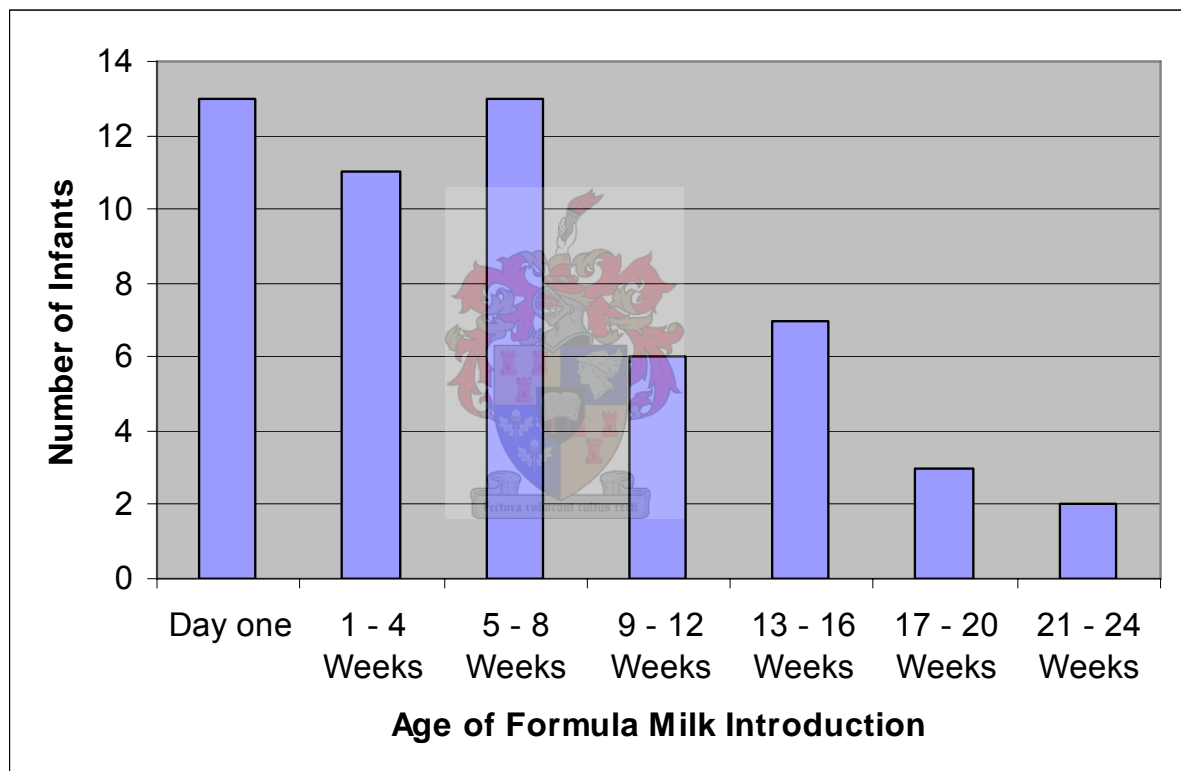
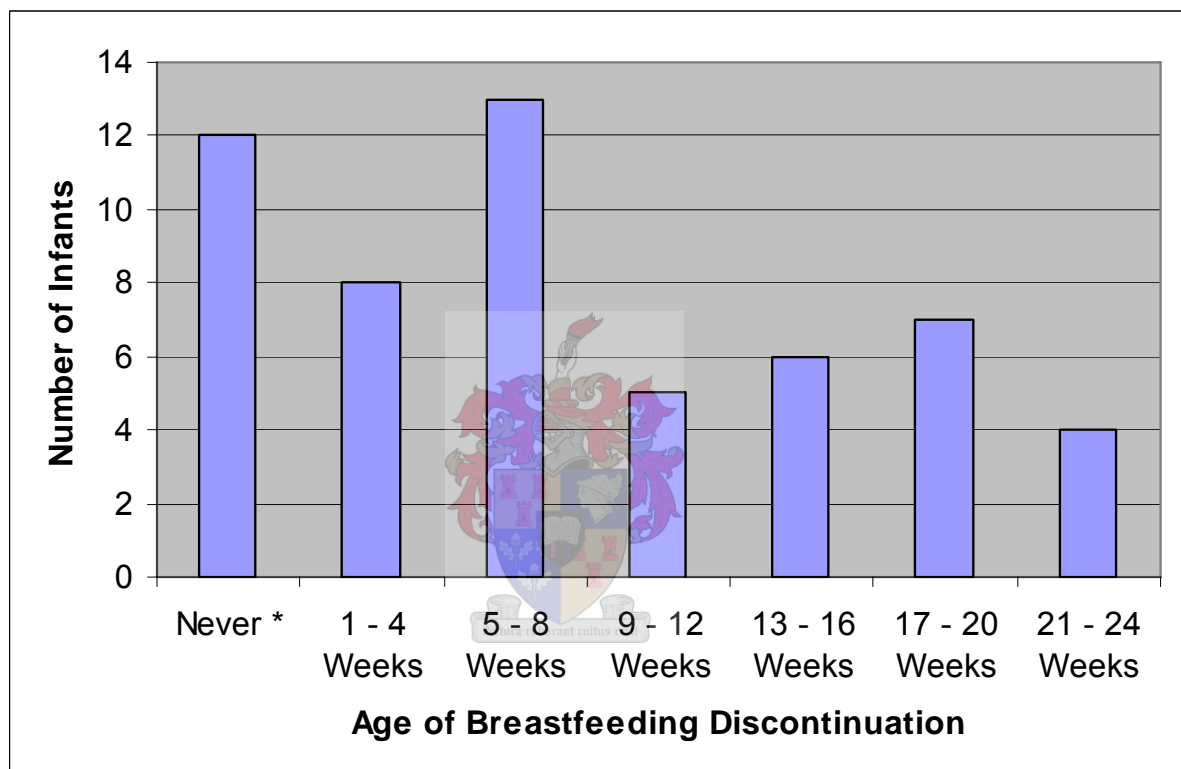


Figure 4.3: Age in weeks when infant formula was introduced (n = 55)

4.3.1.3 Breastfeeding

Twelve infants (21.82%) never received breast milk. Twenty-one (38.18%) of the mothers discontinued breastfeeding within the first 2 months (Figure 4.4) at a median age of 8 weeks and a mean age of 8.67 weeks (± 7.68).



* Infants were never breastfed.

Figure 4.4: Age in weeks when breastfeeding was discontinued (n = 55)

4.3.1.4 Age at which complementary food was introduced

At the time of the study 36 of the mothers (65.45%) had already introduced complementary food into their infants' diet. Six (16.67%) of these mothers reported having introduced complementary food within the first 2 months and 6 (16.67%) did so in the 3rd month (Figure 4.5). The median age of the infants when complementary food was introduced was 16 weeks and the mean age of the infant when complementary food was introduced was 14.67 ± 5.65 weeks and ranged from 1–24 weeks of those infants receiving complementary food at the time of the study.

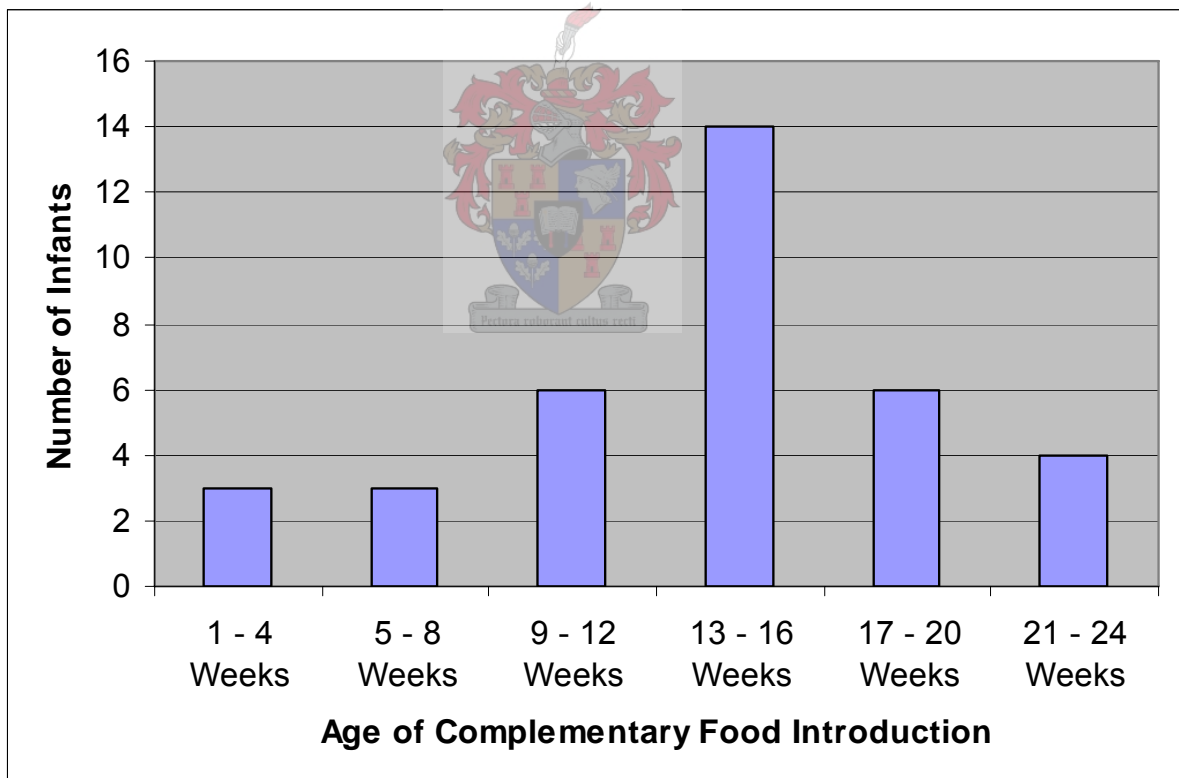


Figure 4.5: Age in weeks when complementary food was introduced (n = 36)

4.3.1.5 Infant formula mothers are currently using and its appropriateness

The infant formulas most often reportedly used were Nan 1 (24; 43.64%) and S26 Gold (14; 25.45%) (Figure 4.6).

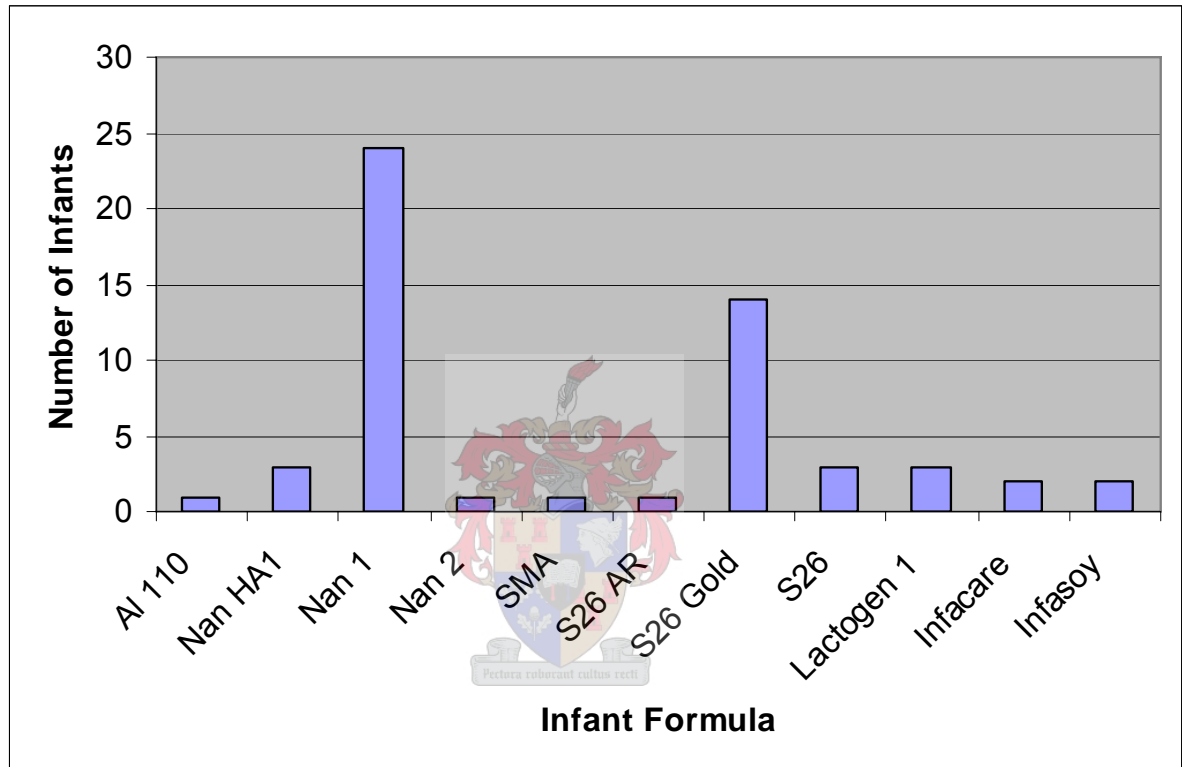


Figure 4.6: Infant formula currently given to the infant (n = 55)

Forty-nine of the infants (89.09%) reportedly received an infant formula, which was appropriate for their reported age and medical condition provided. There were however six infants (10.91%) reportedly receiving an inappropriate infant formula, according to the reported age and medical condition. One infant received a follow-on formula that was inappropriate for the reported age and five infants received specialized products (Al110, NanHA1 and Infasoy), which were not indicated according to the medical history provided.

4.3.1.6 Infant formula mothers tried previously and reasons for discontinuation

Thirty-two of the 55 mothers (58.18%) reported still using the infant formula on which they started the infant. Twenty-three of the 55 mothers (41.82%) however had tried other infant formulas.

The infant formulas most often tried, but discontinued by the 23 mothers was Nan 1 (6; 26.09%), Lactogen 1 (6; 26.09%), S26 (5; 21.74%), S26 Gold (3; 13.04%) Nan HA1 (1; 4.35%), SMA (1; 4.35%) and Infasoy (1; 4.35%).

The most common reasons why the mothers reported discontinuing the infant formula included that the infant did not like the taste (8; 34.77%), it caused constipation in the infant (3; 13.04%) or it was too expensive (3; 13.04%) (Table 4.4).

Table 4.4: Reasons mothers gave for discontinuing the first infant formula

Reason	Infant formula	n	%
Infant did not like the taste	Nan 1 (x 4) Lactogen 1 (x 2) S26 Nan HA1	8	34.77
Caused constipation	Lactogen 1 (x 2) Infasoy	3	13.04
Formula is too expensive	S26 (x 2) S26 Gold	3	13.04
Caused eczema	S26 Gold Lactogen 1	2	8.70
Infant vomited	S26 Gold S26	2	8.70
Infant is lactose intolerant	S26 Lactogen 1	2	8.70
Infant was hungry after feeds	Nan 1	1	4.35
Infant did not grow	Nan 1	1	4.35
No full range available	SMA	1	4.35

Seven of the 55 mothers (12.73%) even discontinued using a second infant formula. The infant formula most often tried secondly, but also discontinued by the 7 mothers was Lactogen 1 (3; 42.86%), Nan 1 (1; 14.29%), SMA (1; 14.29%), Infacare (1; 14.29%) and Infasoy (1; 14.29%).

The most common reasons why the 7 mothers discontinued the second infant formula included that the infants were hungry after feeds – Nan 1, Lactogen 1 (2;

28.57%) and that the infants did not like the taste – Infacare, SMA (2; 28.57%). Other reasons included that the infant did not grow – Lactogen 1, (1; 14.29%), the infant was soy intolerant – Infasoy (1; 14.29%) and that the infant gained weight too quickly – Lactogen 1 (1; 14.29%).

4.3.1.7 Dilution method and volume given to the infant

Twenty-eight of the mothers (50.91%) reported giving a volume of between 101 – 150 ml/kg/24 hours to their infants (Figure 4.7).

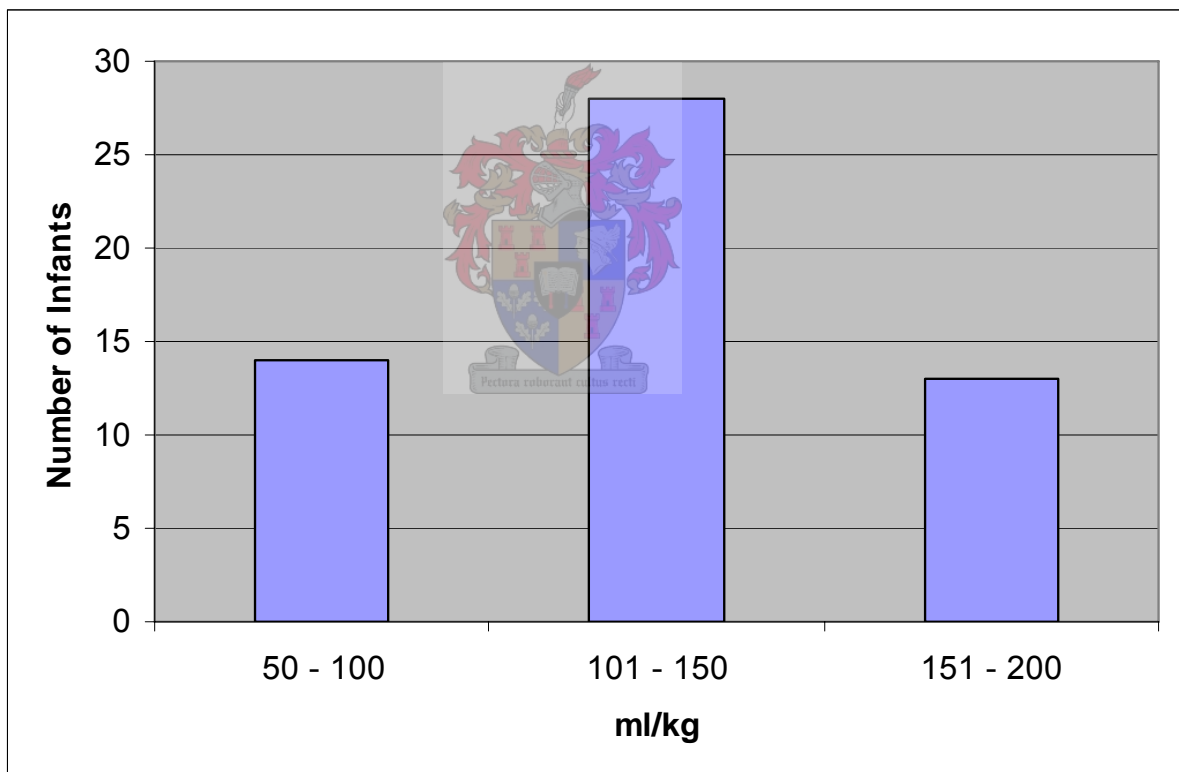


Figure 4.7: The daily volume of infant formula that the infant currently received in ml/kg/24 hour (n = 55)

The majority of infants received the correctly constituted infant formula, but there were a few who received over-diluted infant formula (7; 12.73%) or over-concentrated infant formula (5; 9.09%) (Figure 4.8).

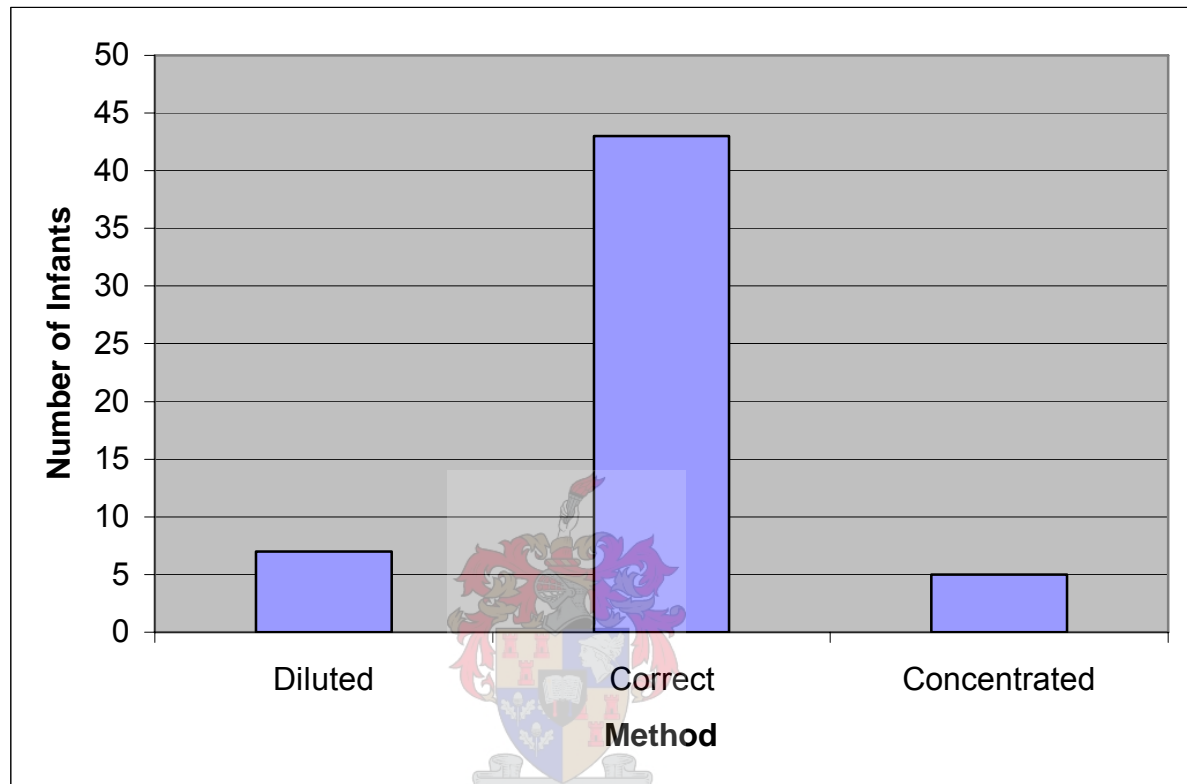


Figure 4.8: Reconstitution method of infant formula, which mothers employed (n = 55)

4.3.2 Older siblings

4.3.2.1 Method of feeding the first of the two or second of three children

A total of 24 (43.64%) mothers had an older child(ren). Seven (29.17%) of these infants received only breast milk with or without complementary food up to the age of 6 months. Fifteen of these 24 infants (62.5%) received a combination of breast milk and infant formula up to the age of 6 months.

The age up to which the first of two or second of three children received breast milk ranged from 0.5–24 months of age $5.19 (\pm 5.36)$.

4.3.2.2 Reasons given for discontinuing breastfeeding the previous child

Several reasons were given for discontinuing breastfeeding. The overwhelming reason mothers gave for discontinuing breastfeeding of the previous born child was that she had to return to work (Table 4.5).

Table 4.5: Reasons mothers gave for discontinuing breastfeeding

Reason given	n	%
Mother returned to work	12	54.55
Child was old enough	3	13.64
Child had a cleft palate	1	4.55
Child did not pick up weight	1	4.55
Child was premature	1	4.55
Child did not latch any more	1	4.55
Mother developed mastitis	1	4.55
Mother had an insufficient milk supply	1	4.55
Mother was too tired	1	4.55

4.3.2.3 Infant formula used for the first of the two children or second of three children

A variety of infant formulas were used. Most of the 24 mothers however used Nan 1 (9; 37.50%), S26 Gold (6; 25.00%), S26 (3; 12.50%) or SMA (2; 8.33%). Other infant formula used included Nan 2 (1; 4.17%), AL110 (1; 4.17%), Omneo Comfort (1; 4.17%) and S26 Gold LBW (1; 4.17%).

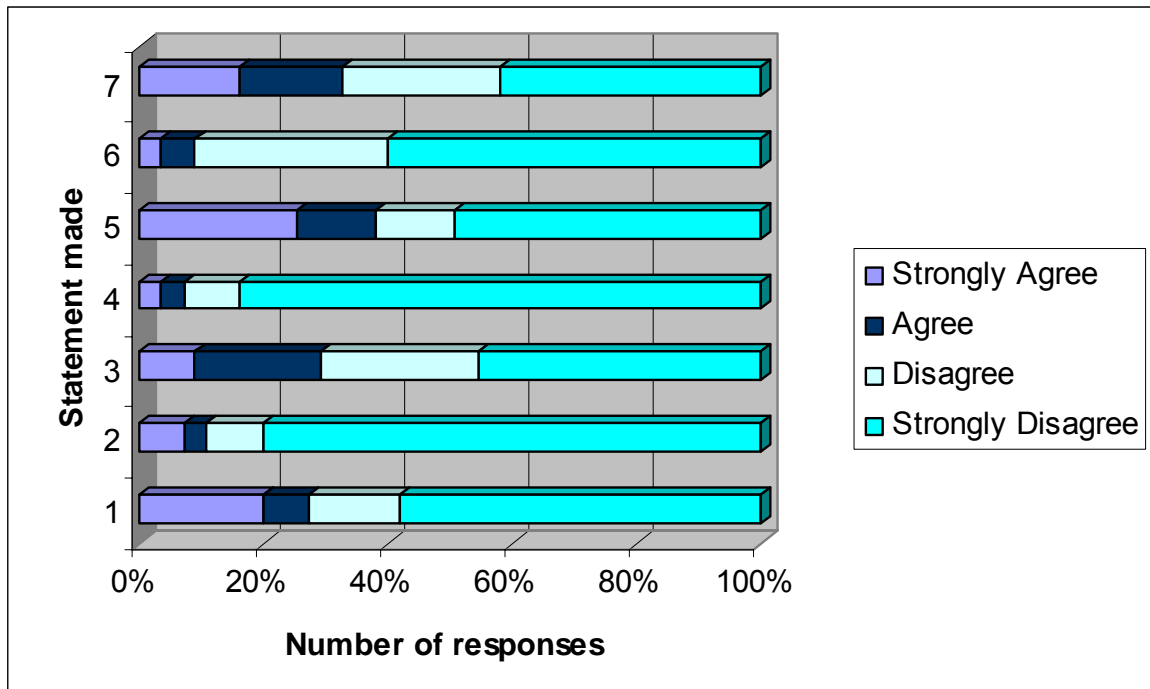
4.3.2.4 Method of feeding the first of three children

Two mothers (3.64%) had three children. Only one infant received breast milk up to the age of 6 months. The other child received both breast milk and infant formula up to 0.5 months of age, and thereafter only infant formula. The reasons the mothers gave for discontinuing breastfeeding included that the child developed reflux and the other one refused breast milk. Their infants received SMA and Nan HA1 respectively.

4.4 FACTORS INFLUENCING THE MOTHERS' DECISION TO FORMULA FEED

4.4.1 Personal factors

A few personal factors were identified that influenced the mother's infant feeding decision (Figure 4.9). The majority of mothers (40; 72.73%) disagreed with the statement that they did not enjoy breastfeeding. Most mothers (49; 89.09%) also did not agree with the statement that they considered breastfeeding repulsive and the majority of mothers (39; 70.91%) indicated that they would not feel embarrassed if someone saw them breastfeeding. The majority of mothers (51; 92.72%) disagreed that they did not want to breastfeed due to other's bad experiences. Quite a few mothers (21; 38.18%) felt that they did not want to breastfeed because they do not have previous experience or knowledge of breastfeeding, while most mothers disagreed (50; 90.91%) that a lack of, or inadequate, health care support influenced their decision not to breastfeed. Most mothers (37; 67.28%) indicated that the fact that they could not express breast milk or use a breast pump did not influence their decision to breastfeed.

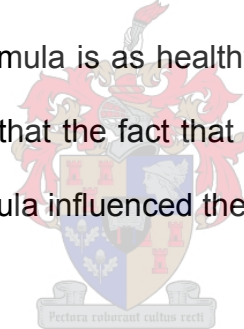


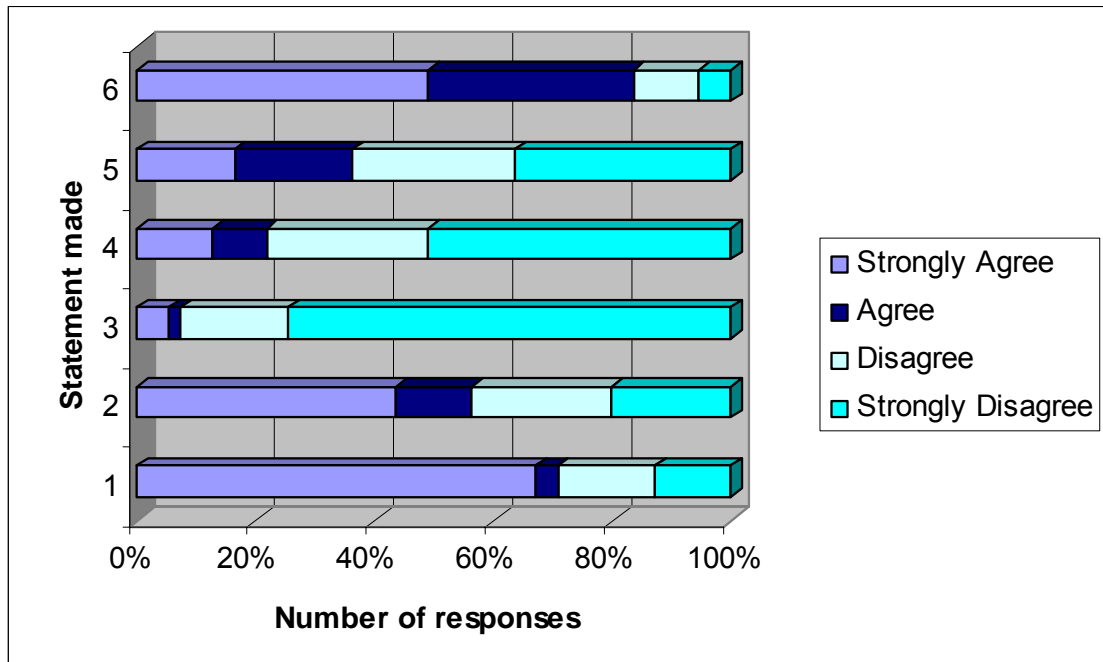
1. I do not enjoy breastfeeding
2. I consider breastfeeding repulsive
3. I would feel embarrassed if someone saw me breastfeeding
4. I did not want to breastfeed due to other's bad experiences
5. I do not have previous experience or knowledge of breastfeeding
6. I lack or have inadequate health care support
7. I could not milk out or use a breast pump

Figure 4.9: Mothers' responses to personal statements regarding her perception of breastfeeding (n = 55)

Factors affecting the composition of breast milk also influenced the mother's decision (Figure 4.10). The majority of the mothers (39; 70.91%) agreed with the statement that a mother who smokes should not breastfeed and many mothers (31; 56.36%) also agreed with the statement that a mother who occasionally drinks alcohol should not breastfeed her baby – the response to this statement might reflect their feeling in general, and not necessarily their own practices.

Most mothers tended to disagree (51; 92.73%) with the statement that medication, which they took, prevented them from breastfeeding. There was however a few mothers (12; 21.82%) who agreed that they were afraid that their breast milk would not have the optimum composition while more than a third of the mothers (20; 36.36%) agreed that infant formula is as healthy as breast milk for their baby. Most mothers agreed (46; 83.64%) that the fact that they know what volume of milk their infant receives with infant formula influenced their decision to rather not breastfeed.



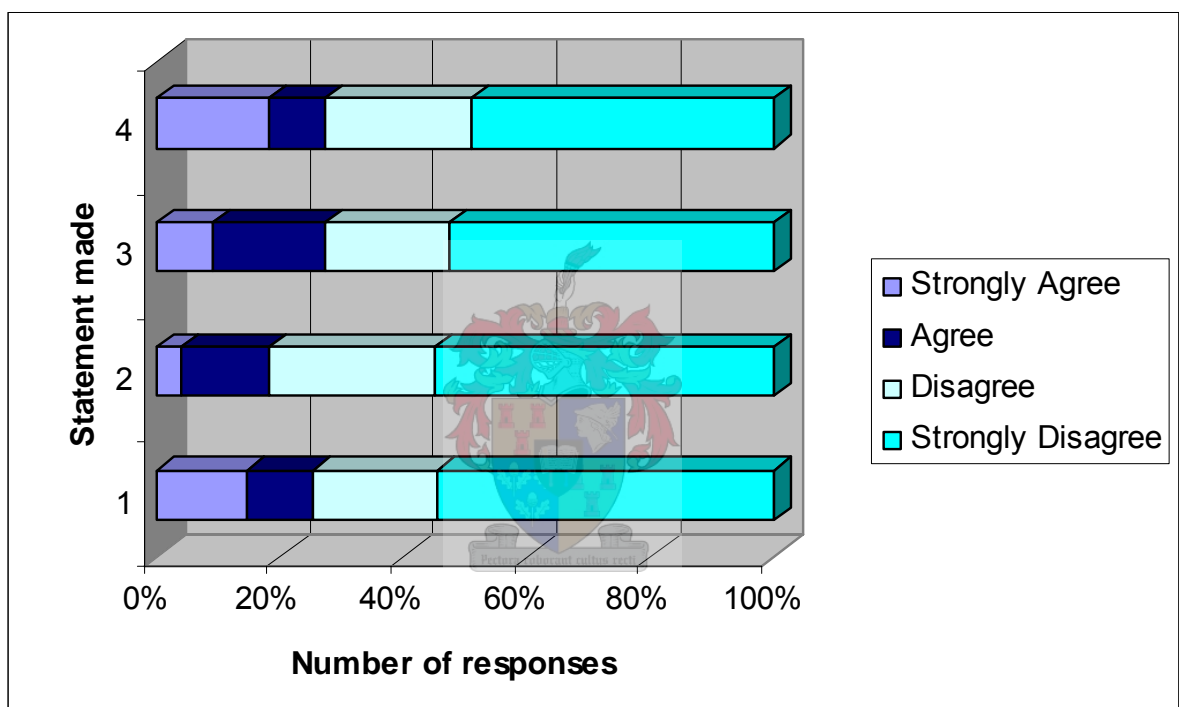


1. A mother who smokes should not breastfeed
2. A mother who occasionally drinks alcohol should not breastfeed her baby
3. I am on medication and thus do not want to breastfeed
4. I am afraid my breast milk will not have the optimum composition
5. Formula is as healthy for an infant as breast milk
6. I know what volume of milk my infant receives with formula feeding



Figure 4.10: Mothers' responses to personal statements regarding factors affecting breast milk composition (n = 55)

The possible side effects of breastfeeding on the mother in general did not concern the mothers (Figure 4.11). The majority of mothers (41; 74.55%) felt that the physical pain and discomfort associated with breastfeeding did not discourage them to breastfeed. Forty-six of the mothers (83.64%) agreed that they were not worried about “leaking” and 40 of the mothers (72.73%) also were not worried about engorgement. The majority of mothers (40; 72.37%) felt that breastfeeding does not make them feel run down.

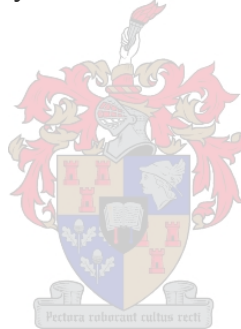


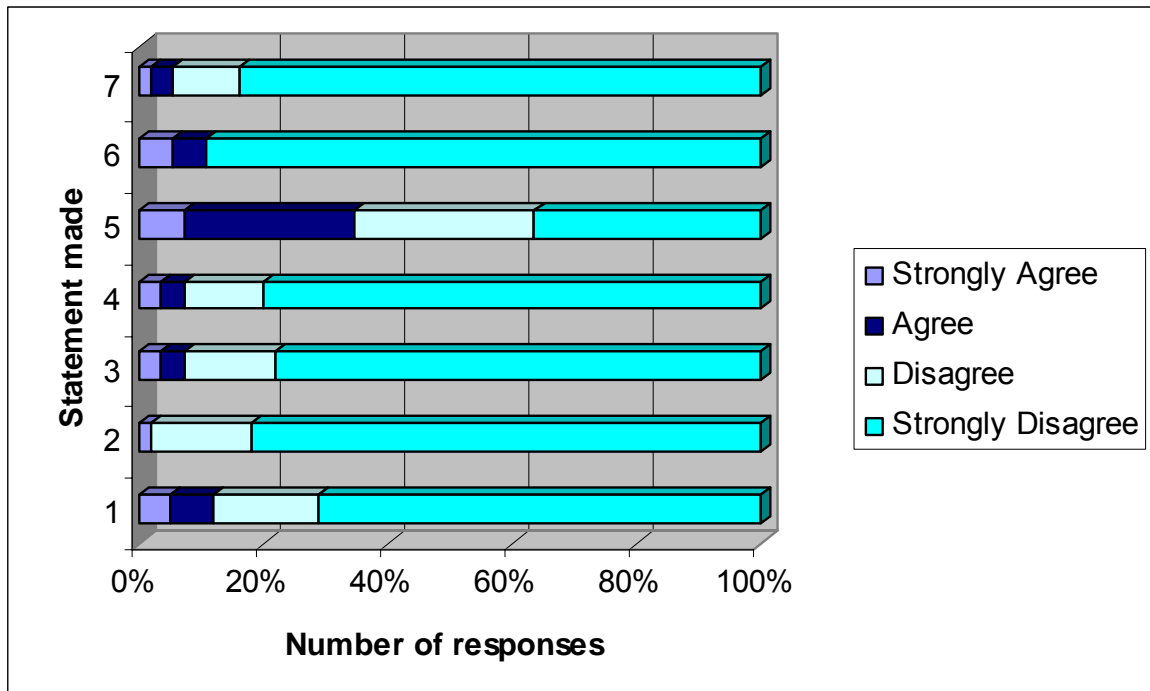
1. The physical pain and discomfort associated with breastfeeding discouraged me to breastfeed
2. I was worried about “leaking”
3. I was worried about engorgement
4. Breastfeeding makes me feel run down

Figure 4.11: Mothers’ responses to personal statements regarding possible side effects of breastfeeding (n = 55)

It seems as if the physical appearance of the majority of mothers did not influence their infant feeding practices (Figure 4.12). Most mothers disagreed (48; 87.28%) that their breasts were too small or too large to breastfeed. Almost all of the mothers disagreed with the statement that they could not breastfeed due to too small nipples (54; 98.18%) or inverted nipples (51; 92.72%).

The majority of mothers disagreed (51; 92.72%) that they were afraid they would lose their figure with breastfeeding. One in three mothers (19; 34.54%) were afraid that breastfeeding would make their breasts sag, while most mothers (49; 89.10%) disagreed that they underwent previous breast surgery. Almost all the mothers disagreed (52; 94.54%) that they were afraid that breastfeeding would increase their chances of breast cancer.

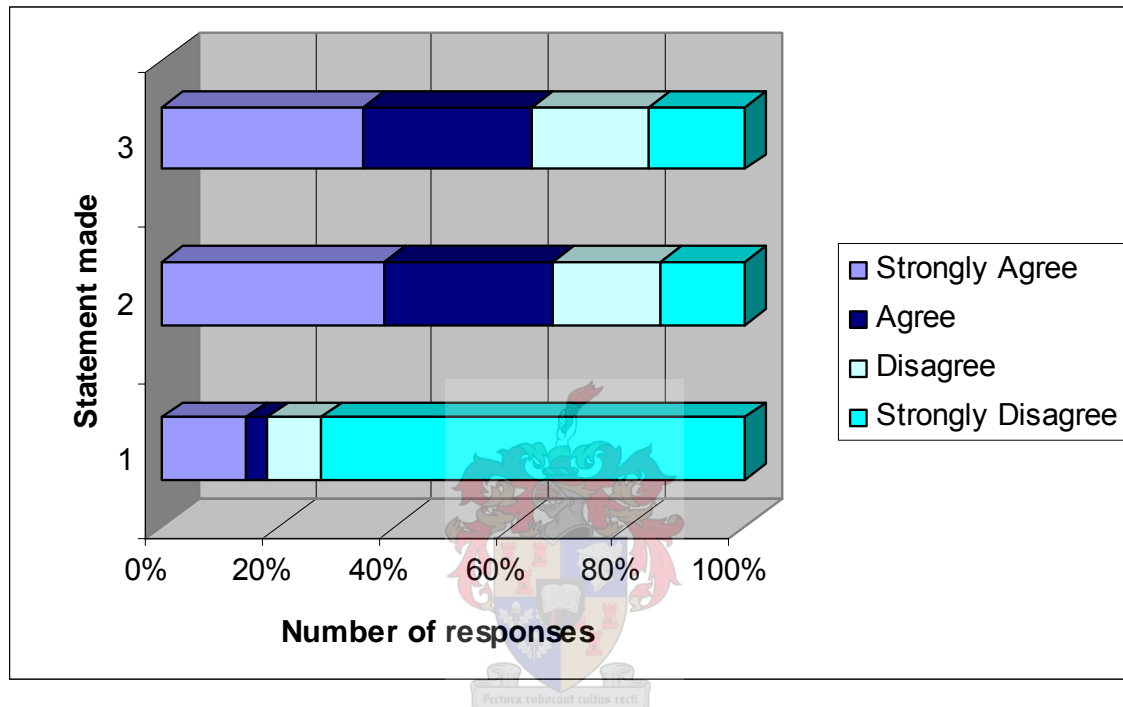




1. My breasts are too small or too large
2. My nipples are too small
3. I can't breastfeed because I have inverted nipples
4. I fear I might loose my figure
5. Breastfeeding will make my breasts sag
6. I underwent previous breast surgery
7. I am afraid that breastfeeding will increase my chances of breast cancer

Figure 4.12: Mothers' responses to personal statements regarding the physical barriers to breastfeeding (n = 55)

Figure 4.13 indicates that most mothers disagreed (45; 81.81%) with the statement that their husbands preferred them to formula feed. More than half of the mothers (37; 67.27%) however felt that the fact that they can share the workload with their husband caused them to opt for formula feeding instead of breastfeeding. Most mothers (35; 63.64%) indicated that formula feeding is better if they are working.

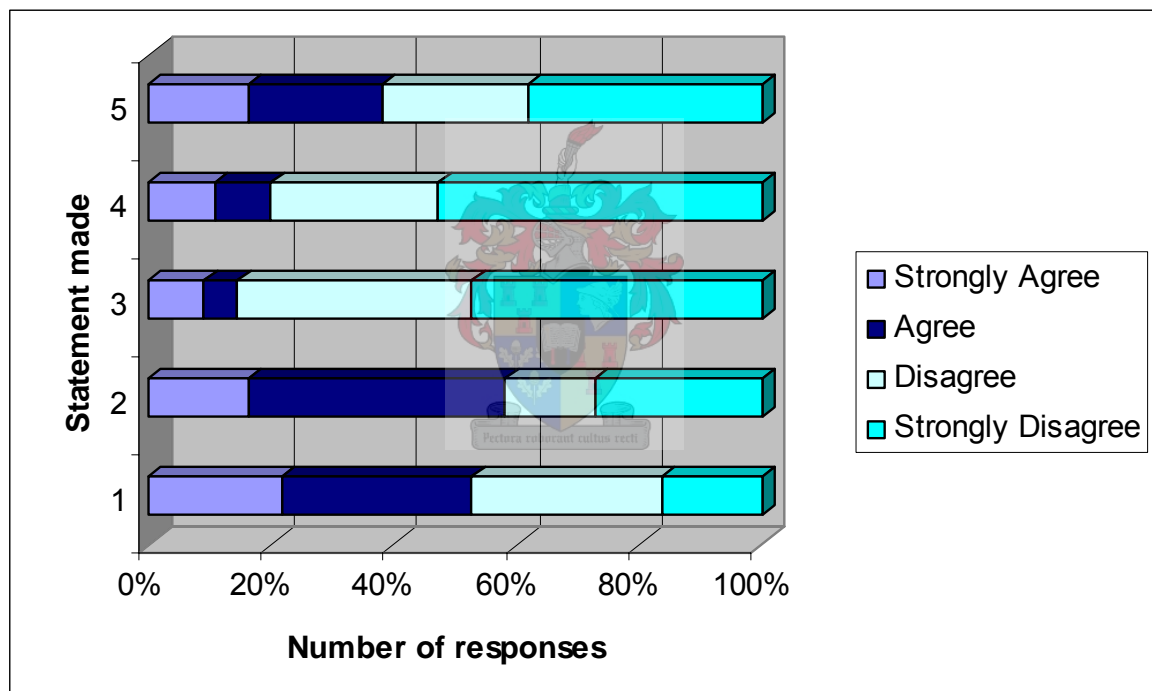


1. My husband prefers me to formula feed
2. With formula feeding I can share the workload with my husband
3. Formula feeding is better if I am working

Figure 4.13: Mothers' responses to personal statements made regarding the workload of breastfeeding (n = 55)

4.4.2 Social factors

Mothers seemed divided when asked whether breastfeeding ties women down socially, but more than half agreed with the statement and indicated that successful breastfeeding depends on your social support network. The majority of mothers (47; 85.45%) did not feel that men find breastfeeding women less attractive. Eleven (20.00%) of the women indicated that encouragement and support in breastfeeding from their husbands was lacking and almost two-thirds did not agree that fathers felt left out if mothers breastfeed (Figure 4.14).

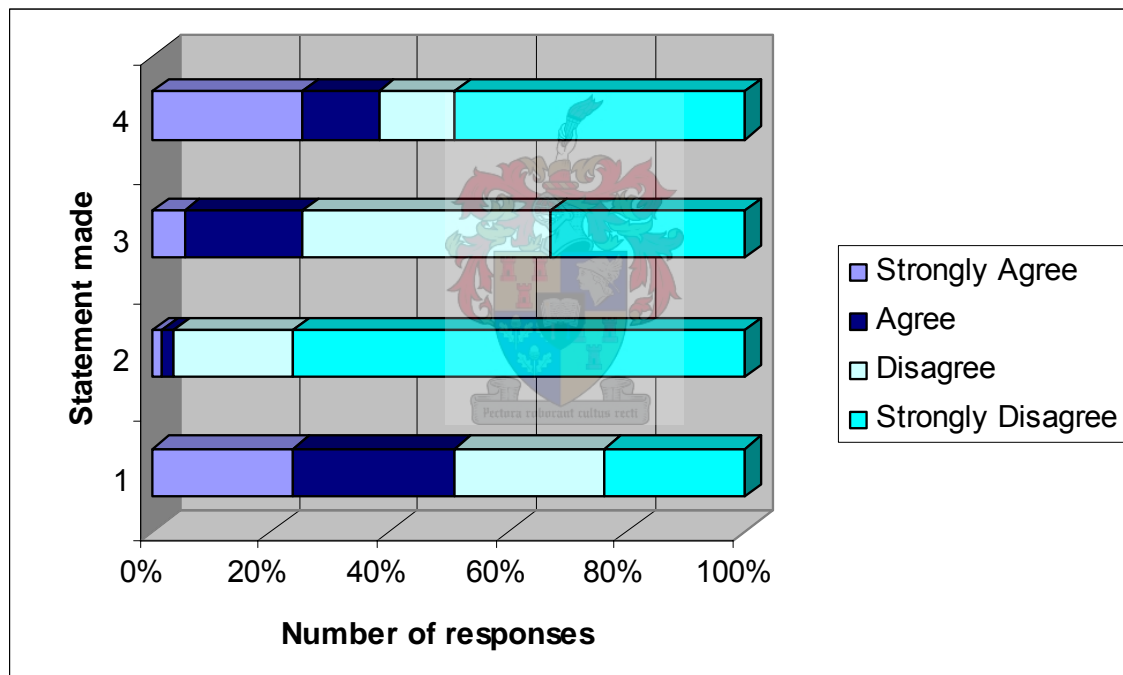


1. Breastfeeding ties women down socially
2. Successful breastfeeding depends very much on the social support network
3. Men are less attracted to breastfeeding women
4. Encouragement and support in breastfeeding from my husband is lacking
5. Fathers feel left out if a mother is breastfeeding

Figure 4.14: Mothers' responses to social statements (n = 55)

4.4.3 Cultural factors

The mothers had different opinions about whether it is acceptable to breastfeed in public (Figure 4.15). Although most mothers (53; 96.36%) felt that breastfeeding is a natural human activity, almost half of the mothers (27; 49.09%) felt that it is unacceptable to breastfeed in public and 14 (25.45%) of the mothers felt that it is unacceptable to breastfeed in front of others. Twenty-seven (49.09%) mothers indicated that the fact that their own mother could not breastfeed, or preferred not to, influenced their decision to formula feed.

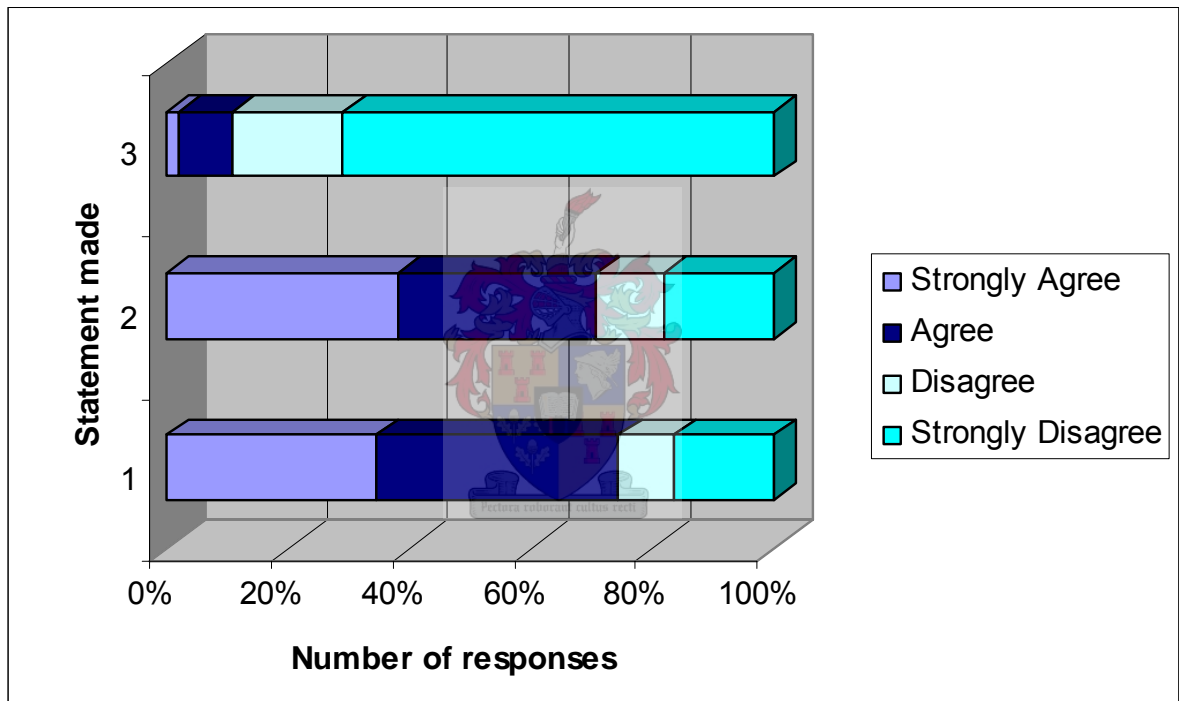


1. It is unacceptable to breastfeed in public
2. Breastfeeding is not a natural human activity
3. It is unacceptable to breastfeed in front of others
4. My mother could not breastfeed, or preferred not to

Figure 4.15: Mothers' responses to different cultural statements (n = 55)

4.4.4 Facilities and environmental factors

In general, privacy for breastfeeding seemed a common obstacle for most mothers (Figure 4.16). Most mothers (41; 74.55%) indicated that no privacy at public places is a barrier to breastfeeding. Most mothers (39; 70.91%) also indicated that the facilities at work do not support breastfeeding. Thirty-nine of the mothers strongly disagreed (70.91%) to the statement that milk formula advertisements influenced her decision to rather formula feed.



1. No privacy at public places is a barrier to breastfeeding
2. The facilities at work do not support breastfeeding
3. Milk formula advertisements has influenced my decision

Figure 4.16: Mothers' responses to different environmental statements

(n = 55)

4.4.5 Information sources

The main information sources (Figure 4.17) reported to have influenced the 55 mothers' decision to formula feed, included clinic nurses (37; 67.27%), paediatricians (35; 63.64%), friends (34; 61.82%), books (33; 60.00%), relatives (31; 56.36%), magazines/newspapers (26; 47.27%) and hospital nurses (25; 45.45%).

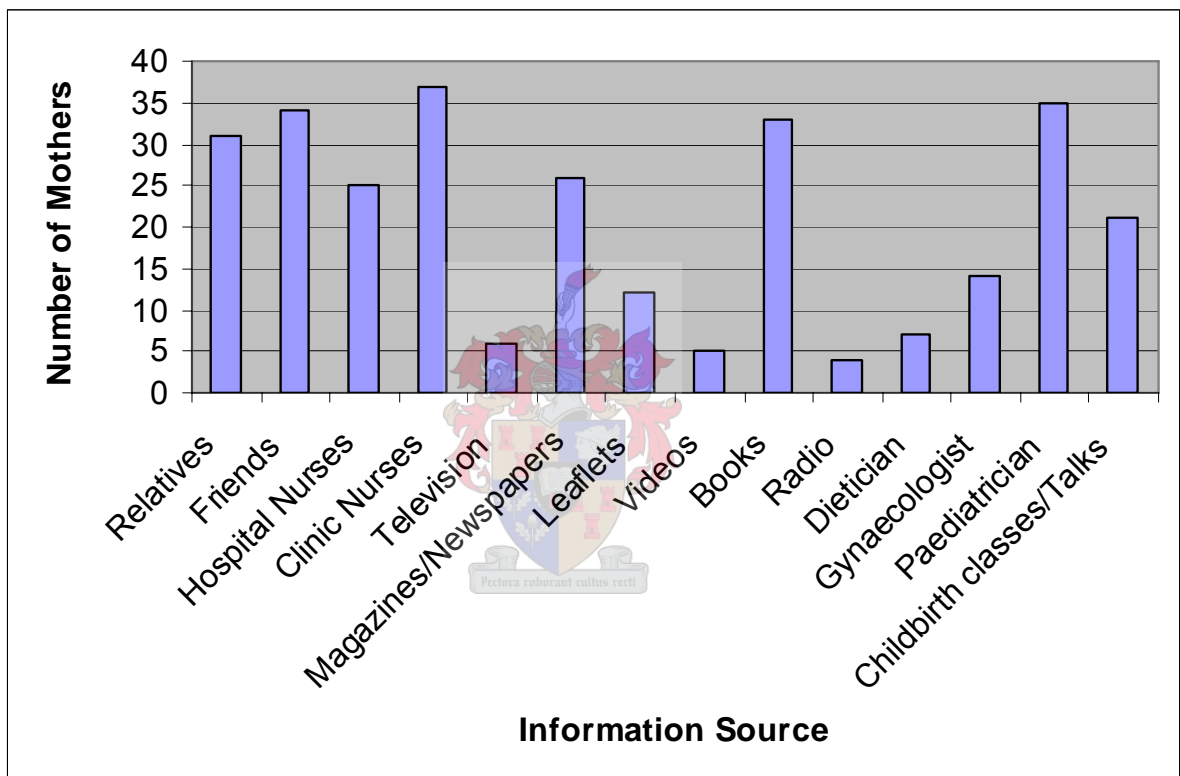


Figure 4.17: Information sources that influenced the mothers' decision to formula feed her infant

4.4.6 Persons influencing the mothers' decision when deciding which infant formula to choose

Mostly the paediatricians (34; 61.82%), clinic nurses (23; 41.82%), family (18; 32.72%) and friends (18; 32.73%) were reported to have given advice regarding which infant formula to use (Table 4.6).

Table 4.6: Persons giving advice regarding which infant formula to use

Advice from	Yes	
	n	%
Paediatrician	34	61.82
Clinic Nurse	23	41.82
Family	18	32.73
Friends	18	32.73
Hospital Nurse	11	20.00
Antenatal Classes	6	10.91
Gynaecologist	6	10.91
Dietician	5	9.09
General Practitioner	2	3.64
Pharmacist	1	1.82

4.4.7 Sources of advertisements influencing the mothers' decision when choosing an infant formula

Mothers reported that advertisements in a book (10; 18.18%), supermarkets (9; 16.36%) and magazine/newspaper (8; 14.55%) most often influenced their decision when choosing an infant formula for her infant (Table 4.7).

Table 4.7: Sources of advertisements that influenced the mothers' decision when choosing an infant formula

Advertisement on	Yes	
	n	%
Book	10	18.18
Supermarket	9	16.36
Magazine/Newspaper	8	14.55
Leaflets	6	10.91
Television	4	7.27
Radio	1	1.82



4.4.8 Properties of the infant formula influencing the mothers' decision when choosing an infant formula

Factors which reportedly most often influence a mother's decision when choosing an appropriate infant formula, includes the composition of the formula (34; 61.82%), the fact that it is always and easily available in shops (28; 50.91%), the name of the product (23; 41.82%), the fact that the infant prefers the taste (23; 41.82%), the fact that the range has follow-on formulae or complementary food available (23; 41.82%) as well as the price (21; 38.18%) (Table 4.8).

Table 4.8: Properties of the infant formula that influenced the mothers' decision when choosing an infant formula

Properties of infant formula	Yes	
	n	%
Composition of infant formula	34	61.82
Always and easily available in shops	28	50.91
Name of the product	23	41.82
Infant prefers the taste	23	41.82
Range has follow-on formulae/complementary food available	23	41.82
Price	21	38.18
Due to infants medical condition	16	29.09
Label of tin	15	27.27
Size of tin	12	21.82
Colour scheme of label	6	10.91
Layout of label	6	10.91
Display in supermarket	6	10.91

4.4.9 Persons who suggested the use of the current infant formula to the mother

Reported persons (Figure 4.18) who most commonly influenced the mothers' decisions when choosing an infant formula included paediatricians (23; 41.82%), clinic personnel (10; 18.18%), the hospital (6; 10.91%), the mothers' own mothers (5; 9.09%) and friends (5; 9.09%).

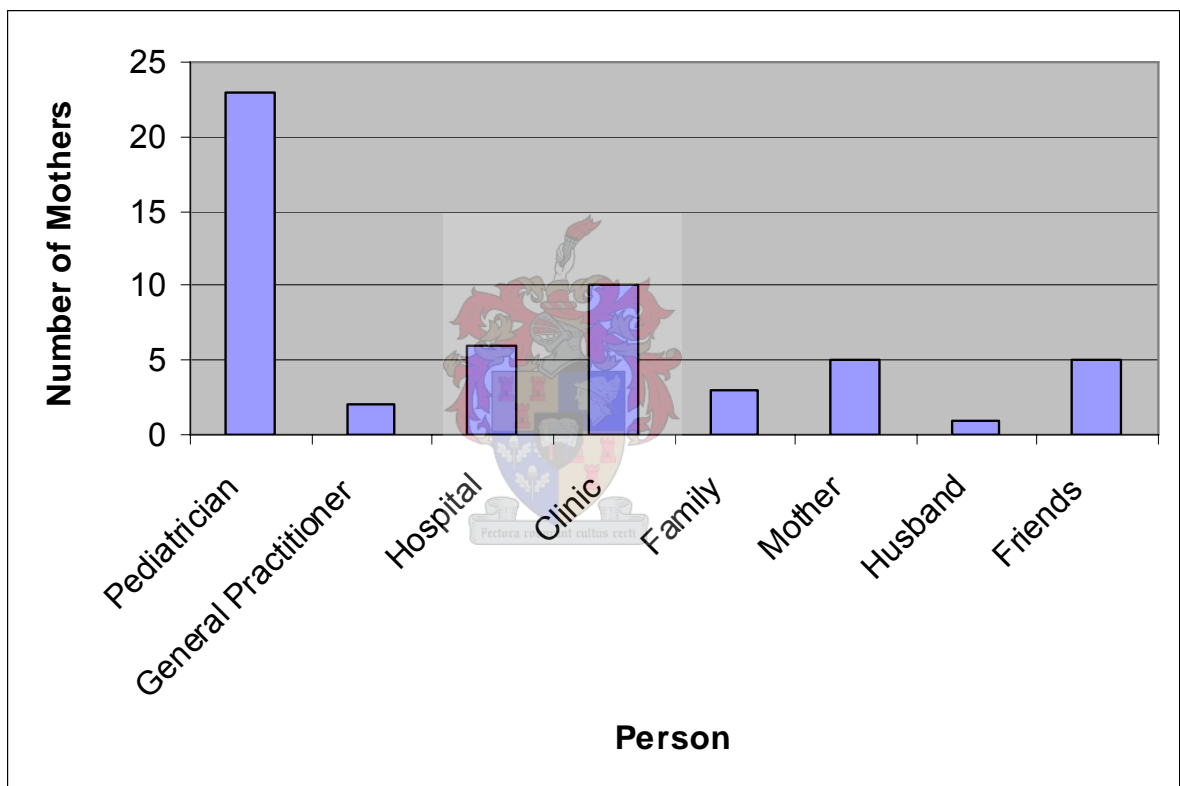


Figure 4.18: Persons most commonly influencing a mothers' decision when choosing an infant formula (n = 55)

4.5 CORRELATION TESTS

A one-way ANOVA (Figure 4.19) of the current employment on duration of breastfeeding shows that current employment has no influence on the duration of breastfeeding ($p=0.16652$). The residuals of this ANOVA proved to be non-normally distributed and the test was repeated non-parametrically with the Kruskal-Wallis test, which confirmed the above conclusion ($p=0.158$). Interestingly, part-time employment in the mother seems to indicate a shorter duration of breastfeeding, whereas self-employed mothers had the longest duration of breastfeeding.

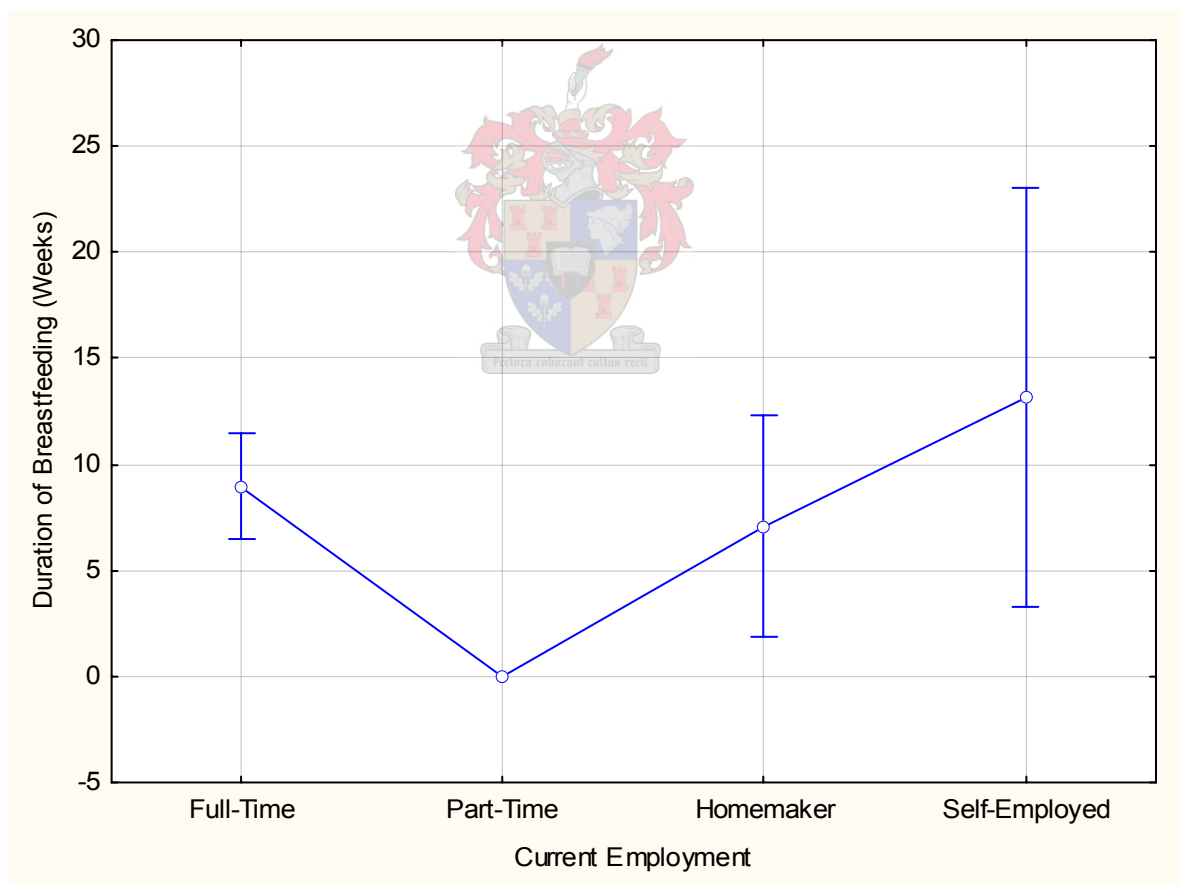


Figure 4.19: The correlation between the current employment of the mother and the duration of breastfeeding

A one-way ANOVA (Figure 4.20) of current employment on the age of introduction of complementary food shows that current employment has no influence on age of introduction of complementary food ($p = 0.92$). The residuals of this ANOVA proved to be non-normally distributed and the test was repeated non-parametrically with the Kruskal-Wallis test, which confirmed the above conclusion ($p=1$).

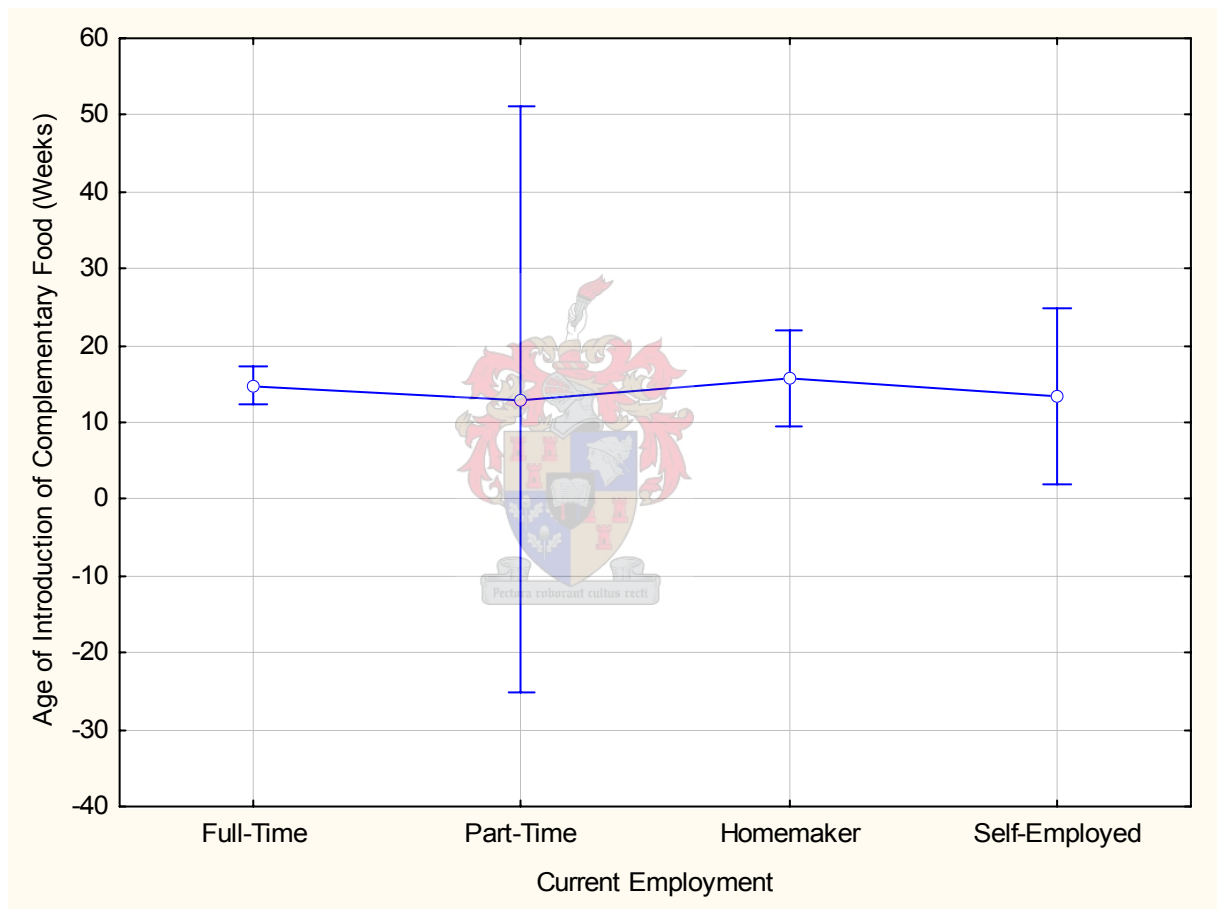
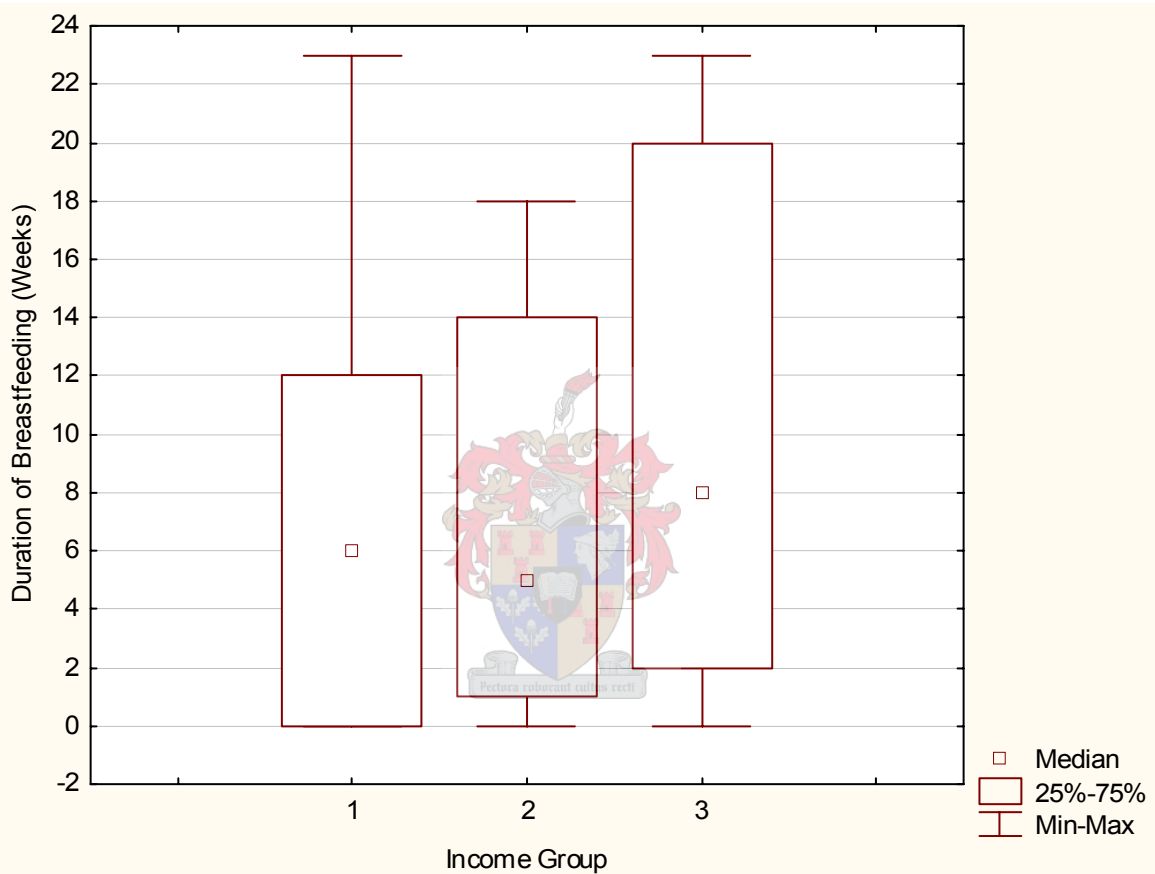


Figure 4.20: The correlation between the current employment of the mother and the age of the introduction of complementary food

There was statistically no significant correlation (Figure 4.21) between the duration of breastfeeding in weeks and the mother's income group. Spearman correlation coefficient = 0.128 ($p > 0.05$). There is however a tendency for higher income group mothers to show a longer duration of breastfeeding.



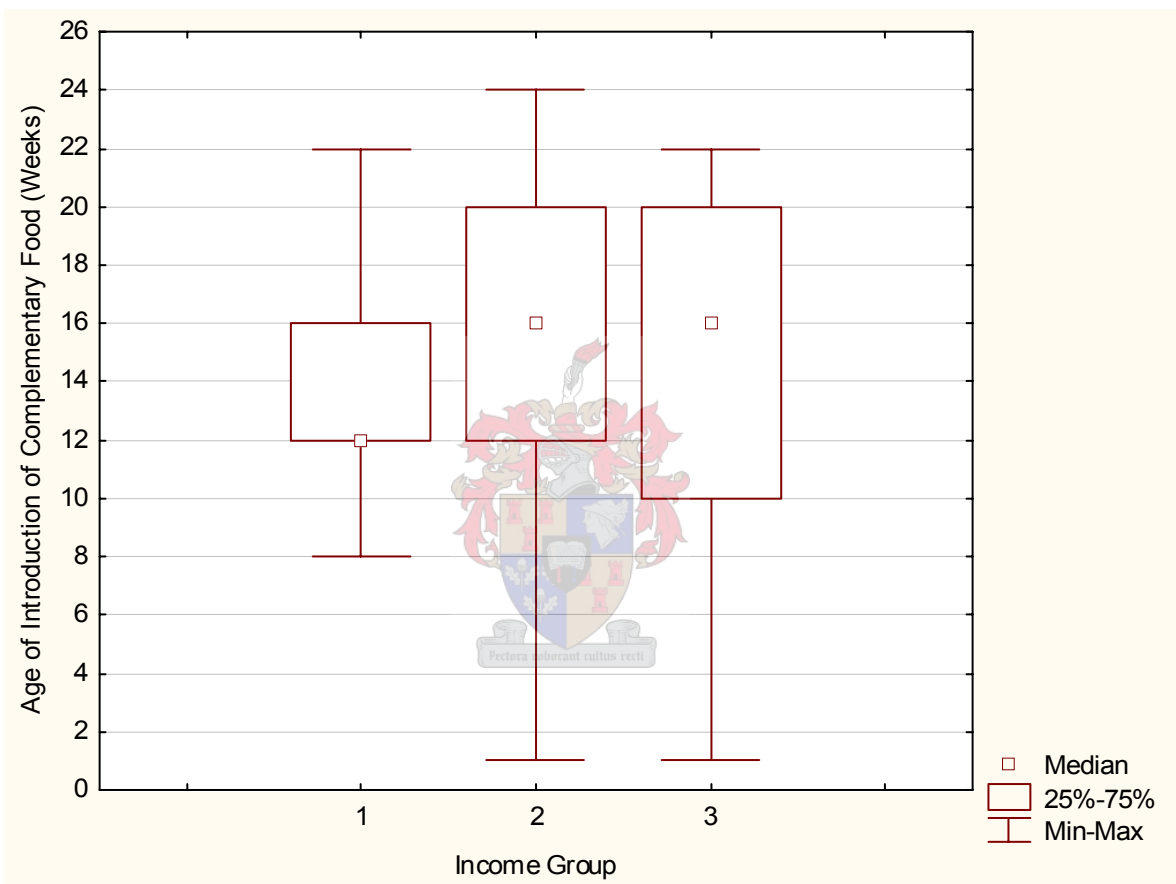
1 = Annual Household Income before tax: R101 652 – R138 792

2 = Annual Household Income before tax: R138 792 – R223 788

3 = Annual Household Income before tax: R223 788 and above

Figure 4.21: The correlation between the income group of the mother and the duration of breastfeeding

There was statistically no significant correlation (Figure 4.22) between the age of introduction of complementary food in weeks and the mothers' income group. Spearman correlation coefficient = 0.09 ($p > 0.05$). The median age of the introduction of complementary food of the lower income group is almost a month earlier than the median of the higher income groups.



- 1 = Annual Household Income before tax: R101 652 – R138 792
 2 = Annual Household Income before tax: R138 792 – R223 788
 3 = Annual Household Income before tax: R223 788 and above

Figure 4.22: The correlation between the income group of the mother and the age of the introduction of complementary food

There was statistically no significant correlation (Figure 4.23) between the duration of breastfeeding in weeks and the mother's current age. Spearman correlation coefficient = 0.0708 ($p > 0.05$).

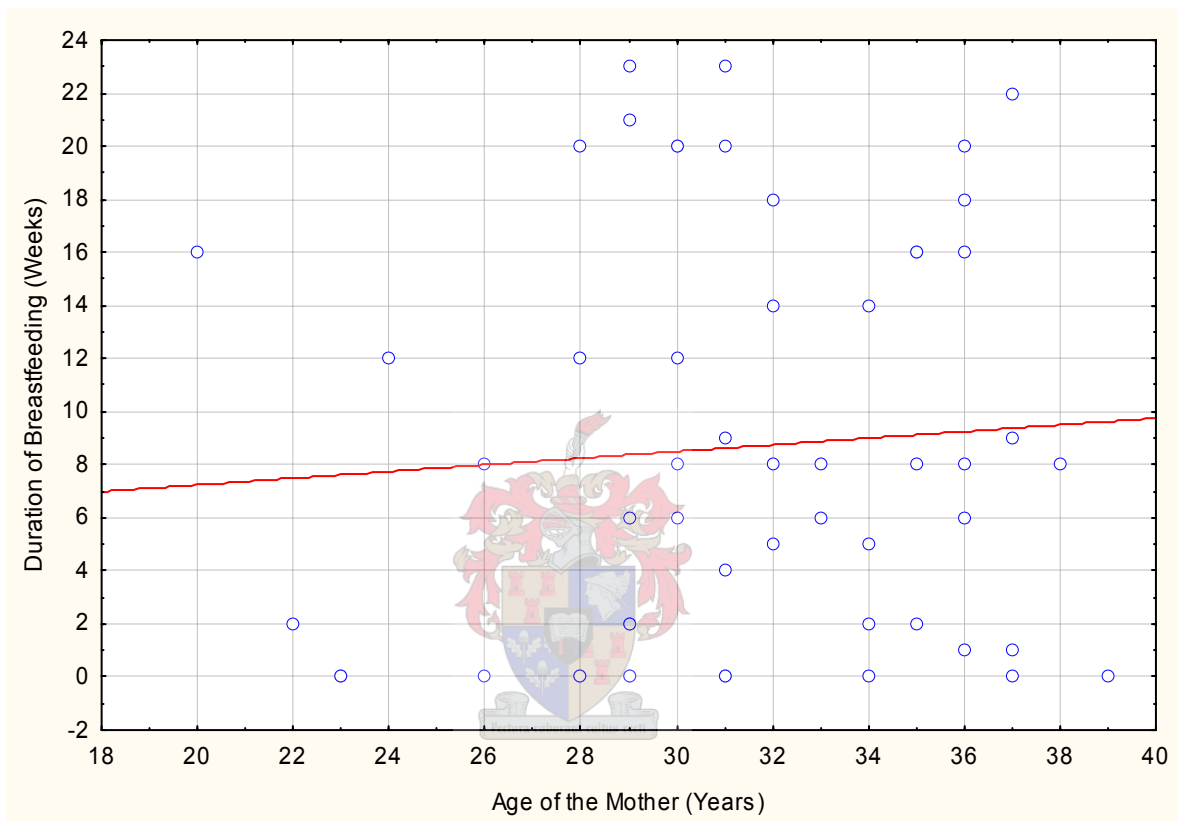


Figure 4.23: The correlation between age of the mother and the duration of breastfeeding

There was statistically no significant correlation (Figure 4.24) between the age of introduction of complementary food in weeks and the mother's current age. Spearman correlation coefficient = 0.2010 ($p > 0.05$).

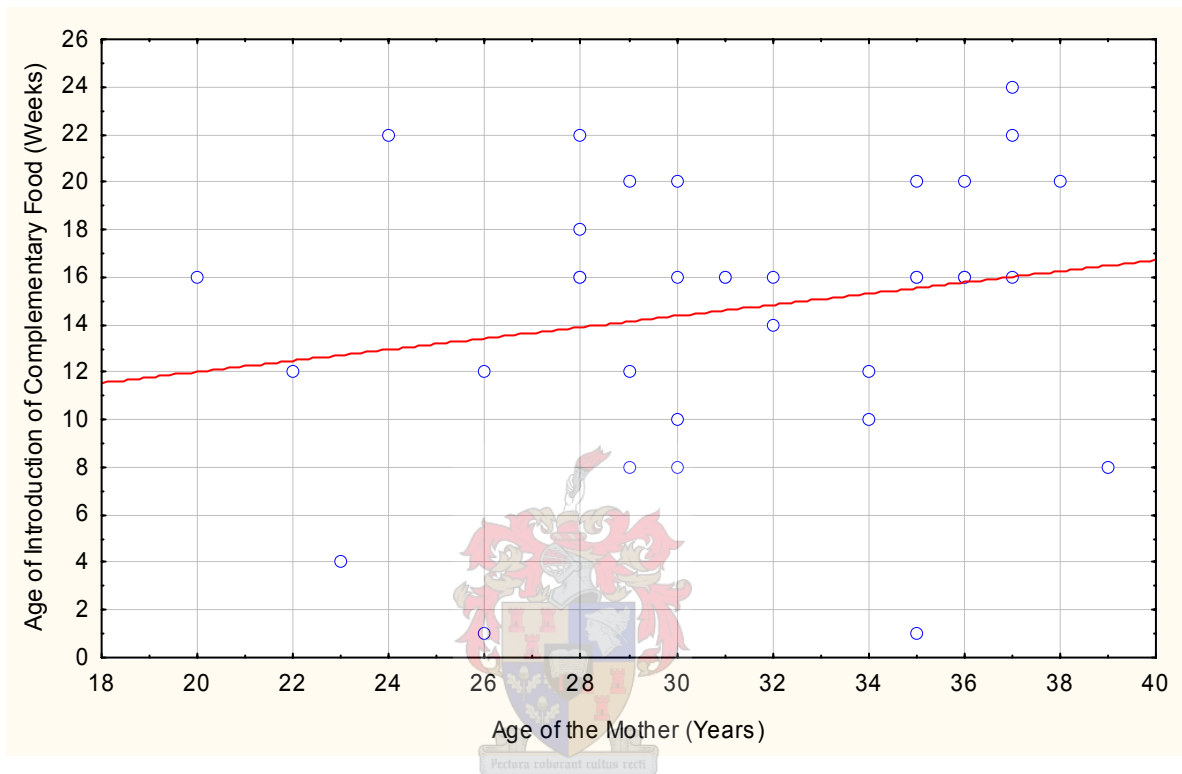


Figure 4.24: The correlation between age of the mother and the age of the introduction of complementary food

CHAPTER 5: DISCUSSION

5.1 STUDY POPULATION

There was a 48% fall out rate for day-care centres, 50% for private clinics and 100% for paediatric practices, because these institutions did not provide consent to participate in the study.

No verbal consent could be obtained from the private practicing paediatricians. Reasons given were that the practise was too busy thus the receptionist could not assist in distributing the questionnaires; the investigator was not able to make contact with the paediatrician to obtain verbal consent; the paediatrician was not in private practice as incorrectly indicated on the list obtained; or the paediatrician was anxious that the questionnaire would negatively influence the mother's perception of the practise.

At the 22 day-care centres and 5 clinics that took part in the study, an 18.97% response rate was obtained. This limited sample size might have influenced the outcome of the study due to the fact that limited responses to each question was obtained, and therefore the results might not reflect the perceptions of all high socio-economic class women in the Cape Metropole.

The majority of the mothers in this study belonged to the White ethnic group (Figure 5.1) and this ethnic group distribution, by income group above R102 401, compares

well with the 2001 Census ethnic group distribution in the City of Cape Town, indicating a representative sample.⁶⁸

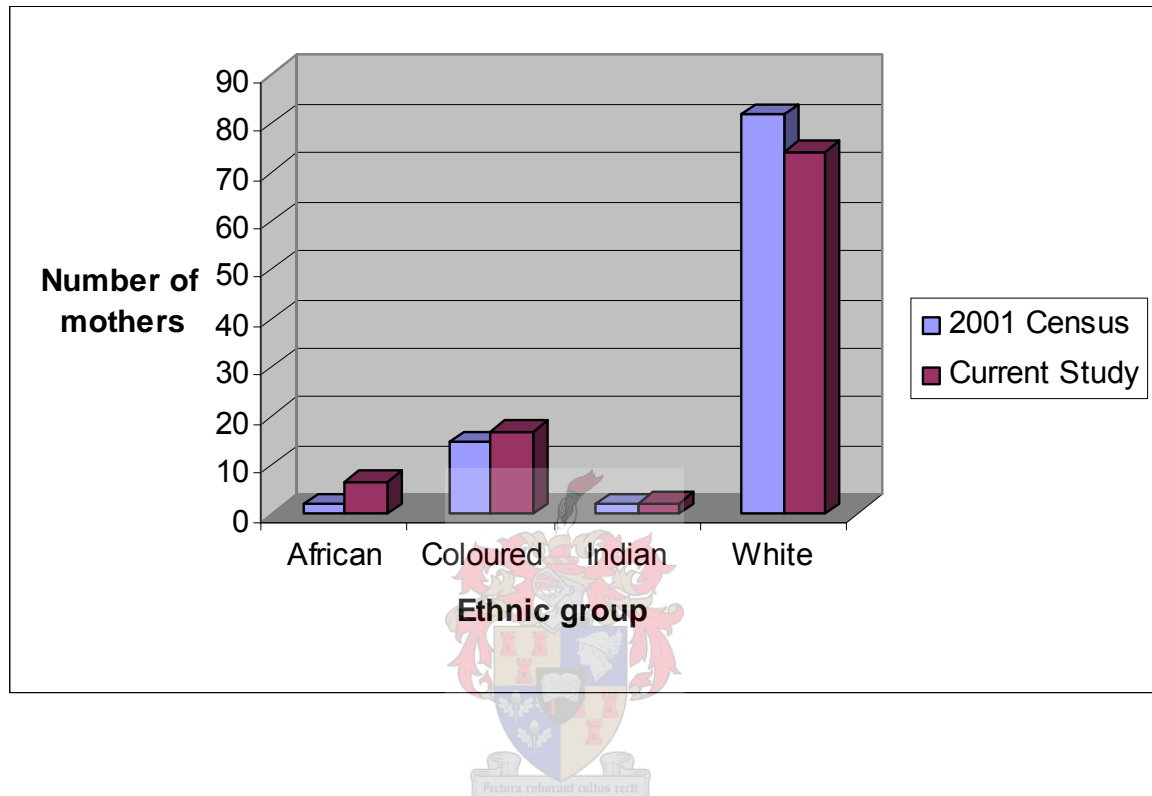


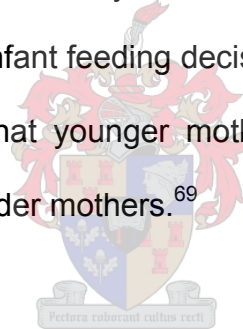
Figure 5.1: Ethnic group distribution of the mothers

5.2 SOCIO-DEMOGRAPHIC INFORMATION OF THE MOTHER

There was a tendency for the majority of mothers to fall into a fairly high-income group (annual household income before tax of R223 788 and above). No correlation could be found between the mother's annual household income and the duration of breastfeeding or the age of the introduction of complementary food to the infant. No other studies could be found in which the same correlation tests were performed.

The investigators' interpretation of the fact that no correlation could be found in this study is that it might indicate that the mother's annual household income does not necessarily influence her infant feeding decision and practices, although mothers from higher income groups could more likely afford to buy infant formula and thus the high cost of infant formula could not have had an influence.

No correlation could be found between the mothers' current age, and the duration of breastfeeding or the age of the introduction of complementary food to the infant, in this study. The investigators interpretation of these findings is the fact that no correlation could be found between the mother's age and duration of breastfeeding or age of introduction of complimentary food, as that the mother's current age does not necessarily influence her infant feeding decision or practices. A study conducted in the USA however found that younger mothers were less likely to exclusively breastfeed their infants than older mothers.⁶⁹



5.3 FEEDING PRACTICES

An interesting finding of this study was that most mothers (80%) made their decision to formula feed their infant only after the birth of their infant, which differs from the 11% found in a study conducted in the USA.⁵ This might indicate that the mothers generally did not have a negative attitude towards breastfeeding (which was supported by the attitudes obtained from the questionnaire), and were only challenged with breastfeeding difficulties after the birth of the infant. External factors present after the birth of the infant thus might have influenced the mother's choice to rather formula feed her infant. The rest of the mothers made the decision to formula

feed their infant either before pregnancy (13%) or during pregnancy (7%), in contrast to the above-mentioned study which found that the majority (63%) of mothers made their infant feeding choice before pregnancy and only 26% during pregnancy.⁵

It was discouraging to find that almost one quarter of the infants started drinking infant formula from birth, more than half started drinking infant formula between 1 to 12 weeks, and the rest started between 13–24 weeks of age. More than one fifth of the infants were never breastfed whilst breastfeeding was discontinued for almost half of the infants during week 1–12 and for one third of the infants during week 13–24. Thus a quarter of the infants in this study were never exposed to the substantial benefits of breast milk. A previous study conducted in South Africa found that 97% of mothers initiated breastfeeding at birth, but only 12% of mothers were still feeding their infant breast milk at 16 weeks of age (with or without water and complementary food). In this lower socio-economic group almost 70% of mothers introduced infant formula to their infants before the age of two months. The main reason given for the introduction of infant formula was that the mother perceived her milk supply to be inadequate.⁴³ The current recommendation is that infants should be exclusively breastfed for the first 24 weeks of life and thereafter complementary food should be introduced while breastfeeding is still sustained up to at least 12 months of age.^{5,6,7,12, 20} Kruse found that infants in the USA, who were exclusively breastfed in the early days after birth, were more likely to still be breastfed at 6 and 12 months of age. It has been observed that more infants are being breastfed over the past decade, but is attributed to infants being breastfed, while also receiving infant formula, and thus not exclusive breastfeeding.⁶⁹

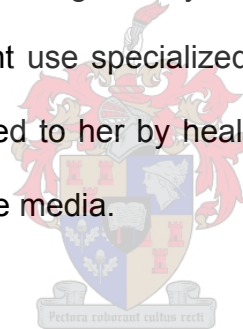
In the case where an infant was not breastfed or only breastfed for a short period of time, both the mother and her infant are denied all the benefits of breast milk including nutritional, immunological, biochemical, anti-allergic, anti-infective, intellectual, developmental, psychological, psychosocial, economic, and environmental benefits.^{5,6,7,8,9,10,11}

At the time of the study, one third of the mothers had not yet introduced complementary food to their infants aged 0 – 6 months, while one third of those that had already introduced complementary food to their infants did so between the age of 1–12 weeks, and more than half did so between the ages of 13–24 weeks. A previous study, also conducted in the Cape Metropole among lower socio-economic participants, found that some mothers started to wean their infants at one month and the weaning process continued until nearly all infants had had complementary foods introduced by the age of four months.⁴³ The current recommendation regarding the introduction of complementary food is that it should only be introduced at the earliest age of 4 months, but ideally only at the age of 6 months. This is due to the concern for the development of food sensitivities.³⁹

The infant formula most often used by the mothers in this study, included Nan 1 and S26 Gold. Despite the high cost of S26 Gold, the investigator found the high usage of this product not surprising, as the mothers often regarded this as the superior formula due to its composition. The investigator found that mothers on the other hand felt that Nan 1 was the most well known infant formula, and thus more individuals recommended this infant formula to them.

More than half of the mothers had tried two types of infant formulas, while a few mothers even tried a third infant formula. Reasons mothers gave why they discontinued the use of these products included constipation, unappealing taste to the infant, the high cost of the infant formula, infant not gaining weight, infant gaining weight too quickly, infant not satisfied after feeds and the occurrence of soy intolerance.

Although most infants received an infant formula which was appropriate for their age and medical condition, there were however six infants who received an infant formula which was not appropriate for their reported age or medical condition. Specialized infant formulas were generally the infant formulas most often used inappropriately. Mothers might use specialized infant formulas inappropriately due to wrong information transferred to her by health care workers or due to perceived benefits transferred through the media.



Although most infants received the appropriately diluted infant formula, there were however a few mothers over-diluting (12.73%) or over-concentrating (9.09%) the infant formula. This correlates with other data on lower socio-economic participants in the Cape Metropole where more than one fifth of mothers incorrectly prepared the infant formula.⁴³ The over-concentration of infant formula might place the infant at risk of gaining weight too quickly and it places an extra load on the kidneys, whilst over diluted milk might place the infant at risk of a low weight gain thus leading to underweight.²²

In this group of participants, the investigator found that two of the infants had a current weight-for-age below the 5th percentile – this might be indicating underweight. This must be interpreted very carefully, as the ideal is to look at the growth trend of the infant, taking the length of the infant into consideration, and not only a once-off weight value. No participants had a current weight-for-age above the 97th percentile, possibly indicating overweight.

Only half of the infants received the correct volume of infant formula – between 101–150 ml/kg/day. Almost a quarter of the infants received too little milk – between 50–100 ml/kg/day. The remaining infants received too large a volume of milk – between 151–200 ml/kg/day. This required infant formula intake is an approximate calculation according to the fluid needs of an infant 10 days old – between 125–150 ml/kg/day, 3 months old – between 140–160 ml/kg/day and 6 months old – between 130–155 ml/kg/day.²² In the event that an infant receives too large or too little volume of milk, the infant might develop malnutrition as a result of an imbalance in acquisition of micro- and macronutrients.

Almost half of the mothers in this study had a second child. Fortunately only a small number of these children never received breast milk. Breastfeeding was however discontinued early and by the age of 6 months, only one third of these children were still being breastfed (with or without the inclusion of complementary food). As with the current infant, the infant formula used most often was Nan 1 and S26 Gold, while the main reason given for the discontinuation of breastfeeding was the mother returning to work.

5.4 FACTORS INFLUENCING THE MOTHERS' DECISION TO FORMULA FEED THEIR INFANT

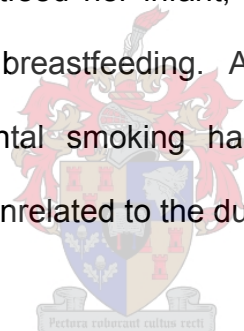
Almost a quarter of the mothers in this study agreed that they did not enjoy breastfeeding. A study conducted in Hong Kong found that a larger percentage of women (40.50%) also disagreed to the statement that breastfeeding is enjoyable.⁴

A large barrier to breastfeeding identified by most mothers is the fact that there is no privacy in public places for breastfeeding. While most mothers in this study agreed that they would not be embarrassed if someone saw them breastfeeding, they mostly agreed that it is unacceptable to breastfeed in public. This finding is in contrast with a study conducted in Hong Kong, which found that most of their participants felt that they would feel embarrassed if someone saw them breastfeeding, this might be due to cultural differences between Hong Kong and South Africa. However, most mothers in Hong Kong also agreed that it is unacceptable to breastfeed in public and they also agreed that the fact that there not being privacy for breastfeeding in public places, is a barrier to breastfeeding.⁴

A large number of mothers in this study felt that they did not want to breastfeed because they do not have previous experience or knowledge of breastfeeding. Mothers in Hong Kong also agreed that if they knew more about breastfeeding, they would breastfeed.⁴ Chezem found that breastfeeding knowledge is strongly correlated with breastfeeding confidence and that it also correlates with the actual duration of breastfeeding.⁴⁷ Less than half of the mothers indicated that their own mother could not breastfeed, or preferred not to breastfeed and that this knowledge

influenced their infant feeding choice. Sarah et al. found that mothers with less knowledge regarding breastfeeding, tended to formula feed their infants.⁴ The investigator concludes that a lack of knowledge regarding breastfeeding, is a great influence on the decision making process of a mother and thus one of the key issues that should be addressed in South Africa is to empower every mother with sufficient knowledge to make an optimal infant feeding decision. Even after making a decision, she should have ongoing motivation and support to practise her decision, for as long as this option is convenient to her.

Most mothers in this study felt that a mother who smokes or who occasionally drinks alcohol should also not breastfeed her infant, thus indicating a lack of knowledge regarding contraindications to breastfeeding. A previous study conducted in China concluded that current parental smoking habits only affected the initiation of breastfeeding and that it was unrelated to the duration of breastfeeding.⁷⁰



In this study population of mainly working mothers, more than three quarters of the mothers agreed to the statement that their facilities at work do not support breastfeeding. The investigator feels that this point is a crucial barrier to breastfeeding that South African policies need to address in order to increase the duration of breastfeeding. In Hong Kong most mothers also felt that the facilities at work do not support breastfeeding practices.⁴ Jeffs found that 10% of mothers gave the reason of “want to go back to work” as the motive for giving an infant formula.¹⁷ Ryan found that working mothers were more likely to discontinue breastfeeding at an earlier period than non-working mothers.⁵⁴ No correlation could be found between the mothers’ current employment status and the duration of breastfeeding in weeks

or the age of the introduction of complementary food to their infant in weeks. There was however a trend for part-time employed mothers to have a shorter duration of breastfeeding, which might be due to these mothers not qualifying for maternity leave.

Although most mothers reported that their husbands did not prefer them to formula feed their infant, almost two thirds of the mothers agreed that the fact that they can share the workload of formula feeding with their husband influenced their infant feeding method decision. Less than half of the mothers agreed to the statement that their husband felt left out when they were breastfeeding. A previous study conducted in the USA found that the fathers of breastfed babies were more likely to believe that breast milk is better than infant formula, helps with infant bonding and also protects the infant from disease.⁵⁹ Bar-Yam concluded from existing literature that fathers influence four aspects of breastfeeding in particular, namely the decision to breastfeed, providing assistance during the first feed, the duration of breastfeeding and the risk factors for formula feeding.⁵⁸

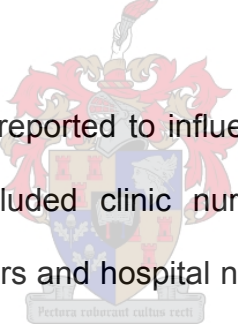
It seems as if most mothers in the study were not afraid that their breast milk would not have the optimum composition and more than a third of the mothers agreed that infant formula is as healthy as breast milk for the infant. Most mothers however preferred infant formula above breast milk, because with infant formula they know what volume of milk their infant receives.

Half of the mothers in this study felt that breastfeeding ties them down socially. This perception is similar to findings from a study performed amongst mothers in Hong Kong.⁴

Although almost all the mothers did not agree to the statement that they have inadequate health care support, almost half of the mothers agreed to the statement that successful breastfeeding depends very much on their social support network. A study conducted in the USA found that a lack of adequate health care support is one of the barriers to breastfeeding.¹⁶

5.5 INFORMATION SOURCES TO THE MOTHER

The main information sources reported to influence the mothers' decision to rather formula feed their infant, included clinic nurses, paediatrician, friends, books, relatives, magazines/newspapers and hospital nurses. Aberman found that one fifth of mothers reported that books influenced their choice of an infant feeding method.⁴⁸



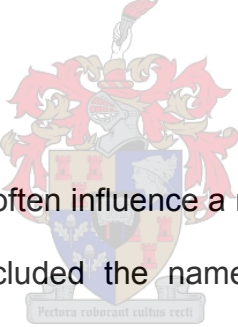
In the USA it has been found that hospital staff and their practices have an under-appreciated role in the promotion or inhibitory effect on breastfeeding.⁶⁹

The investigator's opinion is that one of the greatest challenges to support, protect and promote breastfeeding is to ensure that every information source gives scientifically correct information to the uninformed or information-seeking mother firstly in a standardized and secondly in a positive manner. This can only be achieved if every health care worker receives appropriate training, the media consult

suitable individuals for example a dietician for scientifically correct information and the International Code of Marketing on Breast Milk Substitutes is correctly followed.

5.6 FACTORS INFLUENCING THE MOTHERS' DECISION WHEN DECIDING WHICH INFANT FORMULA TO USE

Mostly the paediatrician, clinic nurse, family and friends were reported to have given advice to the mother regarding which infant formula to use. The investigator concludes that one has to ensure that each information source gives scientifically sound, consistent advice that is in the best interest of the infant mother pair and that the role of a registered dietician should not be overlooked when infant feeding advice is given.



Factors which reportedly most often influence a mother's decision when choosing an appropriate infant formula, included the name of the product, the price of the product, the composition of the product, the fact that the product is always and easily available in the shops, the fact that the range has follow-on formula and complementary food available and the fact that the infant prefers the taste.

It seems as if the International Code of Marketing on Breast Milk Substitutes has a positive effect on the marketing of infant formula, due to the fact that the majority of the mothers reported not being influenced by the advertisement of infant formula on the television or radio.

CHAPTER 6:

SUMMARY, LIMITATIONS, CONCLUSION AND RECOMMENDATIONS

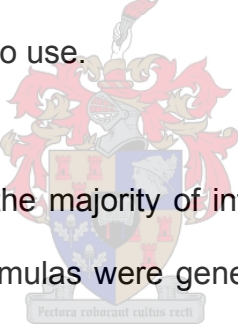
6.1 SUMMARY

Regarding the first objective of this study, the majority of mothers made their decision to formula feed their infant only after the birth of their infant. Factors identified which most often influenced the mother's decision not to breastfeed, included: unacceptability of breastfeeding in public; facilities at work that do not support breastfeeding; not knowing what volume of milk the infant receives with breastfeeding; not enjoying breastfeeding; not wanting to breastfeed due to the lack of previous experience or knowledge of breastfeeding; embarrassment that someone might see them breastfeed; being afraid that breastfeeding might lead to sagging breasts, breastfeeding making the mother feel run down; the physical pain discouraging the mother to breastfeed and being afraid of engorgement.

No correlation could be found between the mother's annual household income and the duration of breastfeeding or the age of the introduction of complementary food to the infant. No correlation could either be found between the mothers' current age, and the duration of breastfeeding or the age of the introduction of complementary food to the infant.

The main information sources reported to influence the mothers' decision to formula feed their infant, included clinic nurses, paediatrician, friends, books, own mother, relatives, magazines or newspapers and hospital nurses.

Regarding the second objective, the factors most commonly reported to influence the mother's decision regarding which infant formula to use, arranged in order of frequency included: the composition of the product, the fact that the product is always and easily available in the shops, the name of the product, the fact that the infant prefers the taste, the fact that the range has follow-on formula and complementary food available and the price of the product. Mostly the paediatrician, clinic nurse, family and friends were reported to have given advice to the mother regarding which infant formula to use.

The image is a watermark of a university crest, featuring a shield with various symbols, topped with a crown and surrounded by decorative flourishes. Below the shield is a motto scroll with the Latin text "Pectora roburant cultus recti".

Regarding the third objective, the majority of infants received an appropriate infant formula. Specialized infant formulas were generally the infant formulas most often used inappropriately. The infant formula most often used by the mothers in this study, included Nan 1 and S26 Gold. Although most infants received the appropriately diluted infant formula, there were however a few mothers over-diluting or over-concentrating the infant formula. Only half of the infants received the correct volume of infant formula per day.

6.2 LIMITATIONS

Limitations of this study included:

- The poor return of the questionnaires and therefore the small sample size that might have influenced the outcome of the study.
- The fact that the paediatrician practices did not give consent to be included in the study.
- Hospital practices influencing the choice of mothers to formula feed or breastfeeding that was not investigated.

6.3 CONCLUSION

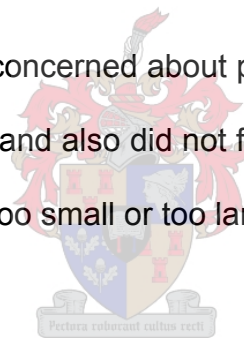
In contradiction to the WHO guidelines, the median age for the introduction of infant formula was 6 weeks and the median age for the discontinuation of breastfeeding was 8 weeks. Of those mothers who already had introduced complementary food at the time of the study, the median age of the introduction of complementary food was 16 weeks.

The majority of the mothers in this study showed a positive attitude towards breastfeeding and decided only after the birth of their infant to rather opt for formula feeding. Evident factors that are barriers to breastfeeding include a lack of knowledge and experience, breastfeeding support after birth as well as a lack of facilities at public places and at work to breastfeed.

A variety of information sources were reported to give infant feeding advice to the mother, ranging from lay persons e.g. friends to professional persons e.g. clinic nurses. Although the majority of mothers reported that they had adequate health support, they felt that successful breastfeeding depends on your social support network.

Perceived benefits of infant formula included that the father could help with the workload and thus the father also does not feel left out if the mother is breastfeeding, the mother knew what volume of formula the infant receives and it is more convenient if she is working.

The mothers were overall not concerned about possible side effects of breastfeeding e.g. leaking and engorgement and also did not feel that their breasts were physically not of optimal physiology e.g. too small or too large to be able to breastfeed.



It can be concluded that numerous internal as well as external factors influence a mothers' decision when deciding whether to breastfeed or formula feed her infant. The investigator feels that the identified barriers to breastfeeding will have to be addressed in order to reach the WHO/UNICEF recommendation of exclusive breastfeeding up to the age of 6 months, and thereafter breastfeeding up to 2 years of age with the introduction of appropriate weaning food.

6.4 RECOMMENDATIONS

It is recommended that every mother in South Africa be empowered to be able to make the optimal infant feeding decision, which will be in the best interest for herself, her infant, her family as well as her community.

In order to protect, promote and support breastfeeding in mothers, the following aspects need to be addressed:

- Educating both parents prenatally regarding the health benefits of breastfeeding.
- Educating a mother who chooses infant formula regarding the appropriate formula to use, correct dilution method and correct volume that should be given.
- Teaching each breastfeeding mother the appropriate skills needed to maintain lactation and prevent breastfeeding problems.
- Educating both parents regarding appropriate weaning practices.
- Providing scientifically correct knowledge, help and support to breastfeeding mothers from birth onwards.
- Install an appropriate length and remunerated maternity leave period.
- Private facilities at work for baby care and thus breastfeeding.
- Provide training to every health care worker to ensure that positive, supportive and uniform, scientifically correct information are given to each mother.
- Ensure that each hospital becomes baby friendly and practices the Ten Steps to Successful Breastfeeding.
- Ensure that lay publications make use of scientifically correct information.
- Portray a positive breastfeeding message to the media.

- Ensure that all country policies promote, protect and support breastfeeding.

In conclusion the following five interventions need to be addressed:⁷¹

- The development of personal skills.
- The reorientation of health services.
- The creation of a supportive environment.
- The development of healthy public policy.
- The strengthening of community action.



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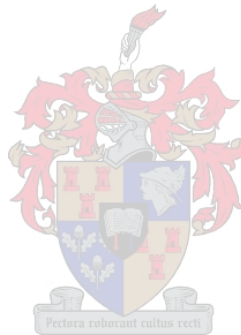
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APPENDICES

Appendix 1: List of day-care centres, private clinics and private practicing paediatricians in the Cape Metropole

List of Day-care Centres:

Abra-Kedabra Crèche	Malibu Street, Oak Glen Bellville	(021) 919 6516
Kinderparadys	Cnr Willie Hofmeyer Street, Strand Road, Bellville	(021) 948 5917
Pooh Corner Baby Care Centre	55 1 st Avenue, Boston, Bellville	(021) 949 9777
Toyland Nursery School	47 Barnard Street, Bellville	(021) 948 4409
Morning Star	Bergvliet	(021) 715 1786
ACVV Bothasig	Oranje Street, Bothasig	(021) 558 4314
Babbelbekkies	19 Tambokie Cresent, Vredeklouf, Brackenfell	(021) 982 6952
Klouter Wouter	1 Essenhout Street, Vredeklouf, Brackenfell	(021) 981 8272
Youngones Babycare Centre	23 John Gainsford Street, Springbok Park, Brackenfell	(021) 982 6402
Arderne Gardens	222 Main Road, Claremont	(021) 671 7046
Choo Choo Park Playschool	2B Cleveland Road, Claremont	(021) 683 1998
Deborah Barnard	Claremont	(021) 683 6293
Lady Buxton Centre	31 Eden Road, Claremont	(021) 674 3110
Little Haven Daycare	76 Garfield Road, Claremont	(021) 683 5062
Angie's Daycare	14 Portulaca Street, Goedemoed, Durbanville	(021) 976 7937
Aristo kids	7 Somerset Crescent, Durbanville	(021) 976 2102
Keros Christian School for Toddlers	22 Koeberg Rd, Durbanville	(084) 623 7874
The Unique Playschool	21 Oryx Street, Goedemoed, Durbanville	(021) 976 3950

Edgemead Daycare	51 Letchworth Drive, Edgemead	(021) 558 9338
Childrens Corner Educare & Daycare	No. 2 16 th Avenue, Fish Hoek	(021) 782 1464
Sunshine Frogs Care Centre	Ou Kaapse Weg, Sun Valley, Fish Hoek	(021) 785 7189
Happy Hamsters	Houtbay	(021) 790 7999
Smurfs	Kenwyn	(021) 797 7241 (021) 797 8595
Cherry's Day Care	Kenwyn	(021) 761 2975
ABC Creche	Kenwyn	(021) 797 8853
Maxine's Daycare	7 Kings Row McKinley Road, Kenilworth	(021) 671 4103 (021) 671 6188
First Friends	Kirstenhof	(021) 701 4438
Daffy Duck – Home from Home	Kirstenhof	(021) 701 9115
Tiny Tots	15 Pollsmoor Road, Kirstenhof	(021) 701 1677
Susan Andrews	Lakeside	(021) 788 1688
Kids Academy	42 Charles Hoffe, Van Riebeeckstrand, Melkbosstrand	(021) 553 3990
Eve's Shoe Educare	325 Koeberg Road, Rugby, Milnerton	(021) 511 5231
Boulevard Play and Baby Centre	32 Monte Vista Boulevard, Monte Vista	(021) 558 4400
The Friends Pre-primary & Educare Centre	13 Windermere Road, Muizenberg	(021) 788 5318
Amelie Murphy	Plumstead	(083) 753 4840 (083) 362 9747
Alpha Day Care	Plumstead	(021) 761 0105
Monique Scott	Plumstead	(021) 797 3451
Palmerston Pre-primary & Educare Centre	99 Main Road, Plumstead	(021) 797 0922
Water's Edge	Kleintuin Road, Seaforth, Simon's Town	(021) 786 3637
Lady Bird Day Care	Southfield	(021) 705 9220
Sunshine Frogs Centre	Kaapse Weg, Sun Valley	(021) 785 7199
Parklands Aftercare	75 Wood Drive, Table View	(021) 556 6052
Exclusive Kidz Academy	6 Fairway Road, Table View	(021) 557 8848
Kids & Company	5 Regent Road, Parklands	(021) 557 3588
Little Camelot	Gray Avenue, Flamingo Vlei, Table View	(021) 556 1760
Safety Haven Daycare	24 Hunter Street, Table View	(021) 556 2533

List of Private Clinics:

Lynn Hydenrych	(021) 715 2539	Kreupelbosch, Constantia
Sharon Wewege	(021) 701 2889	Bergvliet
Nicke Berman	(021) 434 0458	Sea Point
Gill Simons	(021) 790 1825	Houtbay
Verginia Johnson	(021) 790 4196	Houtbay
Panorama Clinic	(021) 939 9720	Panorama
Alex Turner	(021) 438 0020	Camps Bay
Corrairie Runkel	(021) 689 6930	Rondebosch
Lady Buxton Centre	(021) 674 3110	Claremont

List of Private Practicing Paediatricians:

McGivern, AJ	Bellville	021 946 1735
Van Der Merwe, WJA Du Plessis, HHJ	Bellville	021 948 1751
Weber, HC	Bellville	021 949 1450
Sanders, DM	Bellville	021 959 2809
Wates, MA	Bellville	021 918 1911
Zieff, S	Cape Town	021 424 0237
Heyns, H	Cape Town	021 422 1354
Wewege, A Watt, H	Claremont	021 797 2087
Bailey, RM	Claremont	021 674 0933
Puterman, AS	Claremont	021 683 4454
Martin, MW Lund, RJ Van Der Watt, HEM	Claremont	021 761 3408
Christie, T Bruwer, GE	Durbanville	021 975 4314
Smit, WH	Durbanville	021 975 0035
Wagener, DJ	Goodwood	021 595 0332
Bristow, AP	Goodwood	021 595 0320
Bhettay, EM	Goodwood	021 699 1321
Moller, GH	Green Point	021 402 6911
Burgess, JD	Green Point	021 402 6433
Thomson, AJG	Kenilworth	021 797 8150
Grindlay, C De Waal, N	Milnerton	021 551 2994
Zieff, T	Milnerton	021 554 0081
Fiegggen, KJ	Milnerton	021 404 9111 x 4437
Hatherill, M	Newlands	021 658 5319

Vermeulen, JH Van Der Walt, A	Panorama	021 930 0630
Muller, PD Alexander, RJ	Panorama	021 930 0825
Smith, J	Panorama	021 938 9219
Kirsten, GF	Panorama	021 938 6480
De Villiers, GS	Panorama	021 911 0892
Van Schalkwyk, AC	Panorama	021 930 0630
Klein, M Springer, PE Goddard, EA Ireland, JD	Rondebosch	021 658 5319
Ndondo, AP	Rondebosch	021 689 6282
Hartley, PS	Rondebosch	021 658 5297
Mcculloch, MI Zollner, EWA Westwood, ATR Carrhill, MM	Rondebosch	021 658 5111
Desai, F	Rondebosch	021 658 5297
Mann, MD	Rondebosch	021 658 5302
Zar, HJ	Rondebosch	072 228 5869
Argent, AC Cooke, ML	Rondebosch	021 658 5317
Beatty, DW	Rondebosch	021 689 8312
Power, DJ	Rondebosch	082 377 3122
Levin, ME	Rondebosch	021 685 5498
Nuttall, JJC	Rondebosch	021 404 4468
Riordan, GTM	Rondebosch	021 658 5312
Wilmshurst, JM	Rondebosch	021 658 5289
Davidson, A Van Der Merwe, WG Adnams, CM Swingler, GH	Rondebosch	021 685 4103
Walele, AH	Wynberg	021 799 6223
Movsowitz, L	Wynberg	021 797 5940
Morison, A	Wynberg	021 799 1162

Appendix 2: Letter of consent to the day-care centres, private clinics or private practicing paediatricians

9 Boschendal Mews.
Boschendal Street.
Van Riebeeckshof.
BELLVILLE.
7530.

Date.

Institution Address.

Dear Sir/Madam:



PERMISSION REQUIRED FOR RESEARCH PROJECT

I am a final year Masters of Nutrition student at the Department of Human Nutrition, Faculty of Health Sciences Stellenbosch University. I would like to conduct research in the field of infant formula feeding for my M Nutrition thesis.

It is recommended that all babies should be breastfed for at least the first 6 months of life. A global campaign, "The Baby-Friendly Hospital Initiative" (BFHI), a program to certify hospitals as baby friendly that comply with the World Health Organization (WHO) and United Nations Children's Fund (UNICEF)'s Ten Steps to Successful

Breastfeeding recommendations for care of breastfeeding infants and mothers, was launched in 1989 by UNICEF and WHO to advocate breastfeeding.

The low prevalence of exclusive breastfeeding is a cause of concern in South Africa. The South Africa Demographic Health Survey 1998 (SADHS) found that in the first 3 months of life, only 10% of infants were exclusively breastfed, while the rate of bottle-feeding was 48.3% nationally.

The title of the project:

“Factors influencing high socio-economic class mothers’ in the Cape Metropole, decision regarding formula feeding practices”.

Main aim:



- To identify factors that influence high socio-economic class mothers’ decision regarding formula feeding practices.

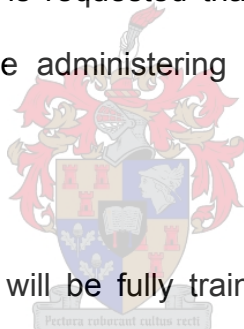
Objectives:

- Identify the reasons why high socio-economic class women decide not to breastfeed.
- Identify the factors that influence the decision-making process when deciding which infant formula to feed the infant aged 0 – 6 months of age.

- Determining if the type and volume of infant formula selected by the mother is appropriate for the infant's needs.

I believe that the information that will be gathered in this research project will help every South African infant towards achieving optimal health through correct nutrition as well as the South African Government towards achieving the goals set by the WHO (World Health Organization) and UNICEF (United Nations Children's Fund).

The successful implementation of this study requires the recruitment of high socio-economic mothers with babies younger than 6 months, who are currently on infant formula. With this in mind, it is requested that your institution/practice consent to participate and assist with the administering of the questionnaires to applicable mothers at your facility.



A member of your staff, who will be fully trained by the investigator, will have to determine if the mother complies with the inclusion criteria, before the relevant documents are handed out. The questionnaire itself is a self-administered questionnaire, which the mother will be asked to complete while she is waiting for her appointment or fetching her child. If it is completed in time it will be handed back to the administrator in a sealed envelope or if sufficient time was not available, the mother will be asked to post the questionnaire upon completion (a self-addressed, stamped enveloped will be provided). Verbal consent will be obtained from the mother and she will be ensured that her response to the questionnaire would in no way influence the treatment received or service provided at your facility.

This study will provide useful insight into the decision-making process that a mother goes through when deciding to formula feed their infant, and which product to use.

Please feel free to contact me if you wish to obtain more information or would like a copy of the protocol.

Your support will be greatly appreciated. I look forward to your positive response to this request.

Yours sincerely,



Mrs D Marais.
Study Leader.
Stellenbosch University.



Miss M Bester.
BSc in Dietetics.

Registered dietician in South Africa.
E-mail address: mbester@sun.ac.za
Cell phone number: 084 925 4855.

Appendix 3: Questionnaire in Afrikaans

Baba Voedings Praktyke Vraelys:

Daar word verskillende tipes antwoorde benodig in die vraelys. Met sommige hoef u net die toepaslike blokkie te merk, terwyl ander 'n geskrewe antwoord vereis.

Datum van voltooiing: _____

Verwysings nommer:

Plek van voltooiing: _____

A. Sosio-demografiese inligting:

1. Wat is u huidige ouderom? _____ Jaar.

2. Etniese groep: (Kies een).

- 2.1 Swart
2.2 Kleurling
2.3 Indies
2.4 Wit

2.5 Ander, spesifiseer asb _____

3. Hoogste Opvoedingsvlak Verkry: (Kies een).

- 3.1 Graad 12
3.2 Diploma / Sertifikaat
3.3 Graad
3.4 Nagraadse kwalifikasie

3.5 Ander, spesifiseer asb _____

4. Huidige Indiensneming: (Kies een).

- 4.1 Voltydse werk
4.2 Deeltydse werk
4.3 Tuisteskepper

- 4.4 Student
4.5 Werkloos
4.6 Eie baas

4.7 Tipe werk: _____

5. Jaarlikse huishoudelike inkomste (Voor belasting): (Kies een).

5.1 R 101 652 – R 138 792

5.2 R 138 792 – R 223 788

5.3 R 223 788 en bo

6. Huwelik status: (Kies een).

- 6.1 Enkel
- 6.2 Getroud
- 6.3 Woon saam
- 6.4 Geskei
- 6.5 Weduwee

B. Inligting van die baba: (Indien tweeling het, voltooi asseblief twee vraelyste).

1. Geslag van baba:

- 1.1 Manlik
- 1.2 Vroulik

2.1 Gestasie ouderdom by geboorte (hoeveel weke was u swanger toe die baba gebore is): _____ weke.

2.2 Chronologiese ouderdom (hoe oud is die baba nou): _____ weke.

2.3 Geboorte gewig: _____ kg.

2.4 Huidige gewig: _____ kg.

3. Tipe geboorte:
- 3.1 Normaal vaginaal
 - 3.2 Keisersnit

4. Hoeveel kinders het u, insluitend hierdie baba? _____

5. Het die baba enige mediese probleme, sedert geboorte?
- 5.1 Ja
 - 5.2 Nee

5.3 Indien ja, spesifiseer asb:

6. Was enige mediese advies vir u gegee rakende voedingspraktyke vir die mediese toestand?

- 6.1 Ja
- 6.2 Nee

6.3 Indien ja, deur wie?

6.4 Wat was vir u gesê?

C. Vorige baba voedings praktyke : (Ignoreer indien hierdie u eerste baba is).

1. Dui asb aan of u vorige kinders geborsvoed, formulevoed of beide was? (Merk die mees toepaslike blokkie).

	Kind	Borsvoed	Formulevoed	Beide
1.1	1			
1.2	2			
1.3	3			
1.4	4			

2. Indien geborsvoed, vir hoe lank en hoekom het u opgehou?

	Kind	Maande	Rede vir staking
2.1	1		
2.2	2		
2.3	3		
2.4	4		

3. Indien formulevoed, watter tipe(s) baba formule het u vir die kind voor die ouderdom van 6 maande gegee?

3.1 Kind 1 _____ 3.2 Kind 2 _____
 3.3 Kind 3 _____ 3.4 Kind 4 _____

D. Voedingspraktyke van hierdie kind:

1. Wanneer het u besluit om hierdie kind te formulevoed? (Kies een).

1.1 Voor swangerskap.

1.2 Tydens 1^{ste} trimester.

1.3 Tydens 2^{de} trimester.

1.4 Tydens 3^{de} trimester.

1.5 By geboorte.

1.6 Na geboorte.

2. Ouderdom van baba wanneer u begin formulevoed het: _____

3. Het u ooit hierdie kind geborsvoed? 3.1 Ja
 3.2 Nee

3.3 Indien ja, vir hoe lank? _____

4. Het u al vaste kosse in die baba se dieet ingesluit? 4.1 Ja
4.2 Nee

4.3 Indien ja, vanaf watter ouderdom? _____ maande.

5. Het u die volgende faktore oorweeg toe u besluit het om formulevoeding te gee, en dus nie te borsvoed nie?

5.1 Persoonlike faktore: Vir die volgende vrae moet u asb een blokkie tussen 1 en 4 merk volgens u mening tov die stelling wat gemaak is:

1 = Stem sterk saam; 2 = Stem saam; 3 = Stem nie saam nie; 4 = Stem glad nie saam nie.

5.1.1 Ek geniet nie borsvoeding nie.

1	2	3	4
1	2	3	4

5.1.2 Ek sal skaam voel as iemand my sien borsvoed.

1	2	3	4
1	2	3	4

5.1.3 Die fisiese pyn en ongemak geassosieër met borsvoeding het my ontmoedig om te borsvoed.

1	2	3	4
1	2	3	4

5.1.4 Ek was bang my melk lek.

1	2	3	4
1	2	3	4

5.1.5 Ek was bang vir melk stuwing.

5.1.6 Ek vind borsvoeding afstootlik.

1	2	3	4
1	2	3	4

5.1.7 Ek wil nie borsvoed nie agv ander se negatiewe ervaringe.

5.1.8 Ek het geen vorige ondervinding / kennis van borsvoeding nie.

1	2	3	4
1	2	3	4

5.1.9 Borsvoeding laat my moeg voel.

5.1.10 'n Ma wat rook behoort nie te borsvoed nie.

1	2	3	4
1	2	3	4

5.1.11 'n Ma wat af en toe alkohol inneem, behoort nie te borsvoed nie

5.1.12 Ek is bang dat my melk nie die optimale samestelling het nie.

1	2	3	4
1	2	3	4

5.1.13 Borsvoeding sal my borste laat hang.

5.1.14 Ek het vorige bors chirurgie ondergaan.

1	2	3	4
1	2	3	4

5.1.15 Ek kan nie borsvoed nie agv ingestulpte tepels

5.1.16 Ek is op medikasie en wil dus nie borsvoed nie.

1	2	3	4
1	2	3	4

5.1.17 Ek is bang dat borsvoeding my kanse vir borskanker sal verhoog.

5.1.18 My borste is te klein of te groot.

1	2	3	4
1	2	3	4

5.1.19 Ek is bang ek sal my figuur verloor.

5.1.20 My tepels is te klein.

1	2	3	4
1	2	3	4

5.1.21 My man verkies dat ek formulevoed.

1	2	3	4
1	2	3	4

5.1.22 Formule melk is makliker as ek moet gaan werk.

5.1.23 Formule melk is net so gesond vir my baba as borsmelk.

1	2	3	4
1	2	3	4

5.1.24 Met formulevoeding kan ek die werkslading met my man deel.

5.1.25 Ek weet hoeveel melk my baba inneem met formule voeding.

1	2	3	4
1	2	3	4
1	2	3	4

5.1.26 Ek kon nie uitmelk of 'n borspomp gebruik het nie.

5.1.27 Ek het geen of te min ondersteuning van gesondheids- personeel ontvang.

5.1.28 Ander, spesifiseer asb:

5.2 Sosiale Faktore: Vir die volgende vrae moet u asb een blokkie tussen 1 en 4 merk volgens u mening tov die stelling wat gemaak is:

1 = Stem sterk saam; 2 = Stem saam; 3 = Stem nie saam nie; 4 = Stem glad nie saam nie.

5.2.1 Borsvoeding bind vrouens sosiaal.

1	2	3	4
1	2	3	4
1	2	3	4

5.2.2 Suksesvolle borsvoeding hang baie af van jou sosiale netwerk ondersteuning.

5.2.3 Mans is minder aangetrokke tot vrouens wat borsvoed.

5.2.4 Aanmoediging en ondersteuning in borsvoeding van my man is ontbrekend.

1	2	3	4
1	2	3	4

5.2.5 Vaders voel nie betrokke nie as 'n ma borsvoed.

5.2.6 Ander, spesifiseer asb:

5.3 Kulturele faktore: Vir die volgende vrae moet u asb een blokkie tussen 1 en 4 merk volgens u mening tov die stelling wat gemaak is:

1 = Stem sterk saam; 2 = Stem saam; 3 = Stem nie saam nie; 4 = Stem glad nie saam nie.

5.3.1 Dit is onaavaarbaar om in die publiek te borsvoed.

1	2	3	4
1	2	3	4
1	2	3	4
1	2	3	4

5.3.2 Borsvoeding is nie 'n natuurlik menslike aktiwiteit nie.

5.3.3 Dit is onaanvaarbaar om voor ander te borsvoed.

5.3.4 My ma kon nie borsvoed nie, of het verkies om nie.

5.3.5 Ander, spesifiseer asb:

5.4 Fasiliteite en Omgewings faktore: Vir die volgende vrae moet u asb een blokkie tussen 1 en 4 merk volgens u mening tov die stelling wat gemaak is:

1 = Stem sterk saam; 2 = Stem saam; 3 = Stem nie saam nie; 4 = Stem glad nie saam nie.

- 5.4.1 Geen privaatheid by publieke plekke hinder borsvoeding.
 5.4.2 Die fasiliteite by die werk ondersteun nie borsvoeding nie.
 5.4.3 Formulemelk advertensies het my keuse beïnvloed.

1	2	3	4
1	2	3	4
1	2	3	4

5.4.4 Ander, spesifiseer asb:

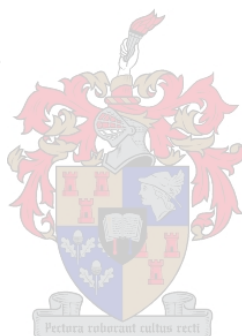
E. Informasie bronne:

1. Dui aan deur die toepaslike blokkie te merk, of u inligting rakende formule voeding ontvang het vanaf die volgende persone: 1 =Ja; 2 = Nee.

- 1.1 Familie
 1.2 Vriende
 1.3 Die hospitaal verpleegsters

1	2
1	2
1	2

- 1.4 Die kliniek verpleegsters
 1.5 Televisie
 1.6 Tydskrifte / Koerante



1	2
1	2
1	2

- 1.7 Pamflette
 1.8 Videos
 1.9 Boeke

1	2
1	2
1	2

- 1.10 Radio
 1.11 Dieetkundige
 1.12 Ginekoloog

1	2
1	2
1	2

- 1.13 Pediater
 1.14 Voorgeboorte praatjies of klasse

1	2
1	2

1.15 Ander, spesifiseer asb: _____

F. Verkose formule melk:

1. Watter tipe formule melk gebruik u tans? _____

2. Het u ander formule melke probeer?

2.1 Ja
 2.2 Nee

<input type="checkbox"/>
<input type="checkbox"/>

2.3 Indien ja, noem asb die produkte en rede waarom u gestaak het daarmee:

Produkt se naam:	Rede vir staking:

3. Hoeveel skeppies van die formule voeg u by 100ml water? _____ skeppies.

4. Watter volume melk kry die baba in 24 uur? _____ ml.

Dui asb aan of die volgende u keuse beïnvloed het toe u besluit het op watter formule melk te gebruik (Merk die toepaslike blokkie): 1 = Ja; 2 = Nee.

5. Raad van:

5.1 Familie

5.2 Vriende

5.3 Voorgeboorte klasse

5.4 Ginekoloog

5.5 Pediater

5.6 Die hospitaal verpleegster

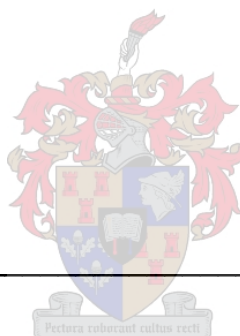
5.7 Die kliniek verpleegsters

5.8 Dieetkundige

5.9 Ander, spesifiseer asb:

1	2
1	2
1	2
1	2

1	2
1	2
1	2
1	2



6. Gereelde advertensies op:

6.1 Televisie

6.2 Radio

6.3 Boek

6.4 Pamflette

6.5 Tydskrifte of Koerante

6.6 Supermark

1	2
1	2
1	2

1	2
1	2
1	2

7. Eienskappe van die formule melk:

7.1 Uitstalling van formule melk blikke in die supermark

7.2 Etiket van die blik

7.3 Grootte van die blik

7.4 Kleurskema van die etiket

7.5 Naam van die produk

7.6 Prys

1	2
1	2
1	2

1	2
1	2
1	2

7.7 Uitleg van die etiket

7.8 Samestelling van die formule

7.9 Altyd en maklik beskikbaar by die winkel

1	2
1	2
1	2

7.10 Baba verkies die smaak

7.11 Agv die baba se mediese toestand

7.12 Die reeks het opvolg formules en kosse beskikbaar

1	2
1	2
1	2

7.13 Ek het gehoor van _____ dat die formule goed is.

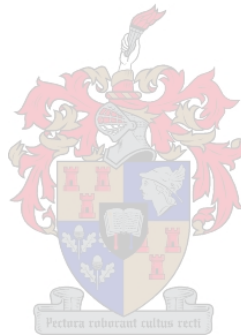
7.14 Enige iets anders wat u keuse beïnvloed het? 7.14.1 Ja

7.14.2 Nee

<input type="checkbox"/>
<input type="checkbox"/>

7.14.3 Indien ja, brei asb uit?

Baie dankie vir u deelname in die navorsings projek, dit word opreg waardeer.



Appendix 4 : Questionnaire in English

Infant Feeding Practices Questionnaire:

There are different types of answers required in this questionnaire. With some you only need to tick the appropriate box, while with others you need to write in an answer.

Date of completion: _____

Reference number:

Place of completion: _____

A. Socio-demographic information:

1. What is your current age? _____ Years.

2. Ethnic group: (Choose one).

- 2.1 African
2.2 Coloured
2.3 Indian
2.4 White

2.5 Other, please specify _____

3. Highest Education Obtained: (Choose one).

- 3.1 Grade 12
3.2 Diploma / Certificate
3.3 Degree
3.4 Postgraduate qualification

3.5 Other, please specify _____

4. Current Employment: (Choose one).

- 4.1 Full-time job
4.2 Part-time job
4.3 Homemaker

4.4 Student
4.5 Unemployed
4.6 Self-employed

4.7 Occupation: _____

5. Household income per year (before tax): (Choose one).

5.1 R 101 652 – R 138 792

- 5.2 R 138 792 – R 223 788
- 5.3 R 223 788 and above

6. Marital Status: (Choose one).

- 6.1 Single
- 6.2 Married
- 6.3 Cohabiting
- 6.4 Separated
- 6.5 Widowed

B. Information on infant: (If mother has twins, complete the questionnaire twice).

1. Gender of infant:

- 1.1 Male
- 1.2 Female

2.1 Gestational age at birth (how many weeks were you pregnant when the infant was born): _____ weeks.

2.2 Chronological age (how old is the infant now): _____ weeks.

2.3 Birth weight: _____ kg.

2.4 Current weight: _____ kg.

3. Type of birth:
- 3.1 Normal vaginal
 - 3.2 Caesarean section

4. How many children do you have including this infant? _____

5. Has the infant experienced any medical problems since birth? 5.1 Yes
5.2 No

5.3 If yes, please specify:

6. Was any medical advice given to you regarding feeding practice for this medical condition? 6.1 Yes

6.2 No

6.3 If yes, by whom?

6.4 What were you told?

C. Previous infant feeding practices : (Please ignore if this is your first child).

1. Indicate if your previous children were breastfed, formula-fed or both? (Tick the most appropriate box).

	Child	Breastfed	Formula fed	Both
1.1	1			
1.2	2			
1.3	3			
1.4	4			

2. If breastfed for how long and reasons for discontinuing?

	Child	Months	Reason for discontinuing
2.1	1		
2.2	2		
2.3	3		
2.4	4		

3. If formula-fed, what type(s) of infant formula did you use for the child under 6 months of age?

3.1 Child 1 _____ 3.2 Child 2 _____
 3.3 Child 3 _____ 3.4 Child 4 _____

D. Feeding practices of this infant:

1. When did you decide to formula-feed this infant? (Choose one).

- 1.1 Before pregnancy.
- 1.2 During 1st trimester.
- 1.3 During 2nd trimester.
- 1.4 During 3rd trimester.
- 1.5 At birth.
- 1.5 After birth.

2. Age of infant when formula feeding was started: _____

3. Did you ever breastfeed this child? 3.1 Yes
 3.2 No

- 3.3 If yes, for what period of time? _____

4. Have you included solids in the infant's diet? 4.1 Yes
 4.2 No

4.3 If yes, from which age did you included solids? _____ months.

5. Did you consider any of the following factors when deciding not to breastfeed and thus rather to formula-feed?

5.1 Personal Factors: For the following questions, you should mark one block between 1 and 4 regarding your opinion of the statement made:

1 = Strongly agree; 2 = Agree; 3 = Disagree; 4 = Strongly disagree.

5.1.1 I do not enjoy breastfeeding.

1	2	3	4
---	---	---	---

5.1.2 I would feel embarrassed if someone saw me breastfeeding

1	2	3	4
---	---	---	---

5.1.3 The physical pain and discomfort associated with breastfeeding discouraged me to breastfeed.

1	2	3	4
---	---	---	---

5.1.4 I was worried about "leaking".

1	2	3	4
---	---	---	---

5.1.5 I was worried about engorgement.

1	2	3	4
---	---	---	---

5.1.6 I consider breastfeeding repulsive.

1	2	3	4
---	---	---	---

5.1.7 I did not want to breastfeed due to other's bad experiences.

1	2	3	4
---	---	---	---

5.1.8 I do not have previous experience/knowledge of breastfeeding.

1	2	3	4
---	---	---	---

5.1.9 Breastfeeding makes me feel run down.

1	2	3	4
---	---	---	---

5.1.10 A mother who smokes should not breastfeed.

1	2	3	4
---	---	---	---

5.1.11 A mother who occasionally drinks alcohol should not breastfeed her baby.

1	2	3	4
---	---	---	---

5.1.12 I am afraid my breast milk will not have the optimum composition.

1	2	3	4
---	---	---	---

5.1.13 Breastfeeding makes my breasts sag.

1	2	3	4
---	---	---	---

5.1.14 I underwent previous breast surgery.

1	2	3	4
---	---	---	---

5.1.15 I can't breastfeed because I have inverted nipples.

1	2	3	4
---	---	---	---

5.1.16 I am on medication and thus do not want to breastfeed.

1	2	3	4
---	---	---	---

5.1.17 I am afraid that breastfeeding will increase my chances of breast cancer.

1	2	3	4
---	---	---	---

5.1.18 My breasts are too small or too large.

1	2	3	4
---	---	---	---

5.1.19 I fear I might loose my figure.

1	2	3	4
---	---	---	---

5.1.20 My nipples are too small.

1	2	3	4
---	---	---	---

5.1.21 My husband prefers me to formula feed.

1	2	3	4
---	---	---	---

5.1.22 Formula feeding is better if I am working.

1	2	3	4
---	---	---	---

5.1.23 Formula is as healthy for an infant as breast milk.

1	2	3	4
1	2	3	4

5.1.24 With formula feeding I can share the workload with my husband.

5.1.25 I know what volume of milk my infant receives with formula feeding.

1	2	3	4
1	2	3	4

5.1.26 I could not milk out or use a breast pump.

5.1.27 I lack or have inadequate healthcare support.

1	2	3	4
---	---	---	---

5.1.28 Other, please specify:

5.2 Social Factors: For the following questions, you should mark one block between 1 and 4 regarding your opinion of the statement made:

1 = Strongly agree; 2 = Agree; 3 = Disagree; 4 = Strongly disagree.

5.2.1 Breastfeeding ties women down socially.

1	2	3	4
1	2	3	4
1	2	3	4

5.2.2 Successful breastfeeding depends very much on your social support network.

5.2.3 Men are less attracted to breastfeeding women.

5.2.4 Encouragement and support in breastfeeding from my husband is lacking.

1	2	3	4
1	2	3	4

5.2.5 Fathers feel left out if a mother is breastfeeding.

5.2.6 Other, please specify:

5.3 Cultural Factors: For the following questions, you should mark one block between 1 and 4 regarding your opinion of the statement made:

1 = Strongly agree; 2 = Agree; 3 = Disagree; 4 = Strongly disagree.

5.3.1 It is unacceptable to breastfeed in public.

1	2	3	4
1	2	3	4

5.3.2 Breastfeeding is not a natural human activity.

5.3.3 It is unacceptable to breastfeed in front of others.

1	2	3	4
1	2	3	4

5.3.4 My mother could not breastfeed, or preferred not to.

5.3.5 Other, please specify:

5.4 Facilities and Environmental Factors: For the following questions, you should mark one block between 1 and 4 regarding your opinion of the statement made:

1 = Strongly agree; 2 = Agree; 3 = Disagree; 4 = Strongly disagree.

5.4.1 No privacy at public places is a barrier to breastfeeding.

5.4.2 The facilities at work do not support breastfeeding.

5.4.3 Milk formula advertisement has influenced my decision.

1	2	3	4
1	2	3	4
1	2	3	4

5.4.4 Other, please specify:

E. Information sources:

1. Indicate by means of a cross, if you receive any information on formula feeding from the following persons: 1 = Yes; 2 = No.

1.1 Relatives

1.2 Friends

1.3 The hospital nurses

1.4 The clinic nurses

1.5 Television

1.6 Magazine / Newspapers

1.7 Leaflets

1.8 Video

1.9 Books

1.10 Radio

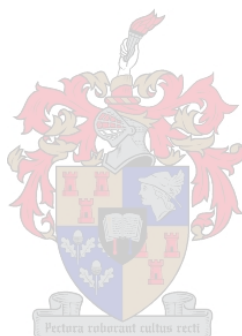
1.11 Dietician

1.12 Gynaecologist

1.13 Paediatrician

1.14 Childbirth classes or talks

1.15 Other, please specify:



1	2
1	2
1	2

1	2
1	2
1	2

1	2
1	2
1	2

1	2
1	2
1	2

1	2
1	2

F. Preferred infant formula:

1. What type of infant formula are you currently using?

2. Have you tried any other products?

2.1 Yes

2.2 No

<input type="checkbox"/>
<input type="checkbox"/>

2.3 If yes, please name the products and the reason for discontinuing:

Product name:	Reason for discontinuing:

3. How many scoops of formula do you add to 100 ml water? _____scoops

4. What volume does the infant receive in 24 hours? _____ml

Please indicate if the following influenced your decision when deciding which infant formula to use (Tick the box): 1 = Yes; 2 = No.

5. Advice from:

5.1 Family

5.2 Friends

5.3 Antenatal classes

5.4 Gynaecologist

5.5 Paediatrician

5.6 The hospital nurse

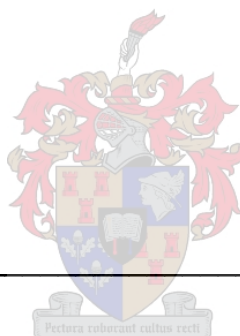
5.7 The clinic nurse

5.8 Dietician

5.9 Other, please specify:

1	2
1	2
1	2
1	2

1	2
1	2
1	2
1	2



6. Regular advertisement on:

6.1 Television

6.2 Radio

6.3 Book

6.4 Leaflets

6.5 Magazine / Newspapers

6.6 Supermarket

1	2
1	2
1	2

1	2
1	2
1	2

7. Properties of infant formula:

7.1 Display of infant formula tins in the supermarket

7.2 Label of the tin

7.3 Size of the tin

1	2
1	2
1	2

7.4 Colour scheme of the label

7.5 Name of the product

7.6 Price

1	2
1	2
1	2

- 7.7 Layout of the label
 7.8 Composition of the formula
 7.9 Always and easily available at shops

1	2
1	2
1	2

- 7.10 Infant prefers the taste
 7.11 Due to the infant's medical condition
 7.12 Range has follow-on formulas or foods available

1	2
1	2
1	2

7.13 I heard from _____ that this infant formula is good.

- 7.14 Anything else that influenced your decision? 7.14.1 Yes
 7.14.2 No

7.14.3 If yes, give details?

Thank you very much for participating in this research project; it is greatly appreciated.



Appendix 5: Letter to the mother in Afrikaans

Boschendal Mews 9.

Boschendal Straat.

Van Riebeeckshof.

BELLVILLE.

7530.

Datum.

Geagte Moeder.



Ek is 'n finale jaar Meesters graad in Voeding student aan die Departement Menslike Voeding, Fakulteit Gesondheidswetenskappe, Stellenbosch Universiteit. Ek is tans besig om navorsing te doen in die area van formule voeding vir my M in Voeding tesis.

Hiermee wil ek graag u deelname in my navorsingsprojek versoek. Deelname is vrywillig en u besluit om deel te neem of nie sal op geen wyse u sorg by hierdie fasiliteit beïnvloed nie.

U word versoek om 'n vraelys te voltooi en na voltooiing kan u dit terughandig aan die fasiliteit in 'n verseelde koevert of pos aan my in die verskafde, vooruitbetaalde koevert.


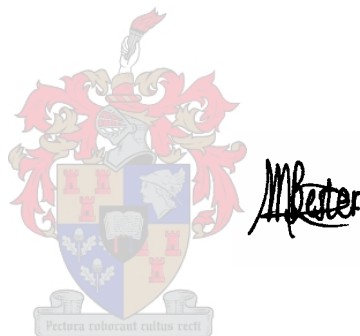
Op geen stadium word daar van u verwag om u naam op die vraelys in te vul nie en dus sal dit anoniem bly. Geen opvolg afspraak of telefoonoproep sal gemaak word nie.

U ondersteuning sal hoogs waardeer word. Ek sien uit na 'n positiewe respons op die versoek.

Die uwe,



Mev D Marais.
Studie Leier.
Stellenbosch Universiteit.



Mej M Bester.
BSc in Dieetkunde.
Geregistreeerde dieetkundige in Suid Afrika.
E-pos adres: mbester@sun.ac.za
Selfoon nommer: 084 925 4855.

Appendix 6: Letter to the mother in English

9 Boschendal Mews.
Boschendal Street.
Van Riebeeckshof.
BELLVILLE.
7530.

Date.

Dear Mother.



I am a final year Masters of Nutrition student at the Department of Human Nutrition, Faculty of Health Sciences Stellenbosch University. I am currently conducting research in the field of infant formula feeding for my M Nutrition thesis.

Hereby I would like to request your participation in my research project. Participation is voluntary and your decision to participate or not will in no way influence the care you receive at this institution.

You will be required to complete a questionnaire, and upon completion either hand it back to the facility in a sealed envelope or post it back to me in the prepaid envelope.

At no point do you require to write your name on the questionnaire and thus it will remain anonymous. No follow-up appointments or phone calls will be made.

Your support will be greatly appreciated. I look forward to your positive response to this request.

Yours sincerely,



Mrs D Marais.

Study Leader.

Stellenbosch University.



Miss M Bester.

BSc in Dietetics.

Registered dietician in South Africa.

E-mail address: mbester@sun.ac.za

Cell phone number: 084 925 4855.



Appendix 7: Ethical approval



UNIVERSITY OF THE WESTERN CAPE
 Faculty of Health Sciences
 Department of Human Nutrition

19 April 2005

Ms M Bester
 Dept of Human Nutrition

Dear Ms Bester

RESEARCH PROJECT: "FACTORS INFLUENCING HIGH SOCIO-ECONOMIC CLASS MOTHERS' IN THE CAPE METROPOLE'S, DECISION REGARDING FORMULA FEEDING PRACTICES "
PROJECT NUMBER : N05/02/022

At a meeting of the Committee for Human Research that was held on 9 March 2005 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 18 April 2005. This project is therefore now registered and you can proceed with the work. Please quote the above-mentioned project number in all further correspondence.

Patients participating in a research project in Tygerberg Hospital will not be treated free of charge as the Provincial Government of the Western Cape does not support research financially.

Due to heavy workload the nursing corps of the Tygerberg Hospital cannot offer comprehensive nursing care in research projects. It may therefore be expected of a research worker to arrange for private nursing care.

Yours faithfully



CJ VAN TONDER
RESEARCH DEVELOPMENT AND SUPPORT (TYGERBERG)

CJVT/ev

Copy to: Prof D Labadarios

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