RELATIONSHIP BETWEEN KNOWLEDGE ON INFANT NUTRITION AND INFANT FEEDING PRACTICES AMONG MOTHERS AGED 15 TO 40 YEARS WITH INFANTS 7 MONTHS TO 1 YEAR OLD AT MARONDERA'S THREE URBAN HEALTH CENTRES

BY

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Abstract

Poor infant feeding practices contribute to infant morbidity and mortality. The purpose of this study was to examine the relationship between knowledge on infant nutrition and infant feeding practices. Pender and Pender's Health Promotion Model was utilised to provide a theoretical framework to guide this study. A descriptive correlation research design was used to guide the research. Simple random sampling of 80 subjects was done with mothers whose infants were 7 months to 1 year. The relationship between knowledge on infant nutrition and infant feeding practices among mothers with infants 7 months to 1 year was examined. Data was collected using a self administered questionnaire. On analysis of data on the relationship descriptive statistics were used that was, percentages and frequencies. Relationship was examined using inferential statistics. The major findings of the study showed that the majority of the women were aged 20-24years and the majority had moderate to high knowledge levels. The mean score for knowledge on infant nutrition was 29.74, and mean score on infant feeding practices was 22.48. Results revealed that there was an imperfect positive relationship between infant feeding practices and knowledge on nutrition. As knowledge increased, the infant feeding practices also improved indicated by r=.259 at p=, .05 level of significance. However, there are other factors which can influence infant feeding practices other than knowledge. Midwives need to use evidence based knowledge in their practice in order to improve the standard of care. Research will build body of knowledge to the profession hence it is wise for nurses and midwives to carryout research.

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BACKGROUND AND ORGANIZING FRAMEWORK

Problem Statement

Polit and Hungler (1999) state that a problem statement is an expression of the dilemma or disturbing situation that needs investigation for the purposes of providing understanding and direction. Poor infant feeding practices contribute to infant morbidity and mortality. This study was prompted by the fact that mothers who choose exclusive breast-feeding wean off their babies abruptly and present later in hospital with malnutrition.

Poor infant feeding practices have been responsible, directly or indirectly, for 60% of the 10.9 million deaths annually among children under five (Piwoz & Prebe, 2010). Well over two-thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first year of life. No more than 35% of infants worldwide are exclusively breastfed during the first months of life, complimentary feeding frequently begins too early or too late, and foods are often nutritionally inadequate and unsafe, (WHO, 2006).

Poor infant feeding practices have been an endemic problem in Africa for decades complicated by a combination of factors. It is estimated that about one third of all children under five in sub Saharan Africa are stunted and more than half suffer from some form of micronutrient malnutrition (Piwoz & Prebe, 2004). There are three overlapping processes that lead to weight loss and wasting in children namely, reductions in food intake, nutrient mal-absorption and metabolism alterations (WHO, 2005). Breast milk is the ideal food for health, growth and development of infants and

young children. It provides protection from infections (Unicef, 2006). In situations such as drought, death of a mother and illness, breast-feeding becomes even more important for infant nutrition and health. The sources needed for safe artificial feeding such as water, fuel and adequate quantities of infant formula are usually scarce in emergencies such as drought, (Martell & Hascke, 2004).

In 2008, at Marondera Hospital 54 infants were admitted due to malnutrition and the majority of the infants suffered marasmus (Marondera Hospital Quarterly Report 2009). At Parirenyatwa Group of Hospitals from January to May 2009, 12 deaths were recorded due to malnutrition, and 134 infants were admitted with malnutrition, 122 infants were transferred to out- patient department due to poor nutrition(Parirenyatwa Quaterly Report 2009. These infants continue to die despite the government effort in putting across strategies such as infant feeding policy and development of millennium goals 4, 5 and 6 which aim at reducing child mortality, improving maternal health and combating HIV and AIDS, Tuberculosis, and Malaria. (UNICEF, 2006). Also one would wonder whether these mothers have correct, current knowledge on nutrition, and which infant feeding practices they engage in.

Artificial feeding increases the risk of diarrhoeal disease and malnutrition in turn substantially increases the risk of infant death (UNICEF, 2006). This problem can be encountered in infants on supplementary feeding. In Zimbabwe breastfeeding is a tradition and breast milk is the main source of nutrition for infants during their first years of life. (Piwoz & Prebe, 2004). The problem comes when infants are weaned off the breast milk too early. This study sought to find out what knowledge mothers had as far as nutrition was concerned and whether they supplemented their infant's

nutrition to prevent malnutrition. Also the investigator wanted to assess the relationship between knowledge on nutrition and infant feeding practices.

Purpose

The purpose of this study was to examine the relationship between knowledge on infant nutrition and infant feeding practices among mothers with infants 7 months to one year at three Urban Health centres.

Theoretical Framework

In a framework model, nursing research is not an entity disconnected from the rest of nursing (Burns & Grove, 2006). This means that whatever is researched, should be put into practice. In this study, the health promotion model, by Pender and Pender (1996) was chosen to guide the study. The model was derived from social learning theory, which emphasizes the importance of cognitive mediating processes in regulation of behaviour. Determinants of health-promoting behaviour are categorised into cognitive-perceptual factors (Individual perceptions), modifying factors and variables affecting the likelihood of action.

In Health Promotion Model individual characteristics (personal factors and prior related behaviour) influence behaviour specific cognitions and affect which will later also influence behavioural outcome. Individual characteristics also influence behavioural outcome. As such, practices like when the mother initiated breast-feeding, when she introduced solids will determine the infants nutritional status. According to Pender (1996), individual characteristics and experiences provide patients background and the base for making decisions concerning lifestyle. Personal biologic factors such as weight for age, weight for height, mid-upper arm circumference against age, head

circumference against age, and developmental milestone against age help to assess nutrition. The modifying factors include demographic factors, interpersonal factors and situational factors or environmental factors as well as behavioural factors.

The cognitive perceptual factors or individual perceptions have direct influence on the likelihood of engaging on a health Promotion Behaviour. These include importance of health, perceived control of health, perceived self-efficacy, perceived health status, perceived benefits or Health Promotion behaviours, perceived barriers to health-promotion behaviours. Also cognitive perceptual factors are equated to knowledge on infant nutrition.

Perceived control of health is another cognitive factor whereby the investigator would like to find out how far the mother can go in controlling infant nutrition. She needs to know which type of food the infant needs for growth and development. In the Health Promotion Model by Pender and Pender, (1996), perceived health status appears to play a role in the frequency and intensity of health-promoting behaviours. If the mother feels confident and loves her child and is competent to care for the child then she feels good. Pender and Pender (1996), postulates that feeling good may be a source of motivation for taking actions that increase personal health status. As a result the motivated mother will report regularly to the health care centre for growth monitoring as compared to a demotivated mother.

On importance of health, the mother may not know the importance of growth monitoring by regular weighing of the infant so as to improve on nutrition. The mother may have basic and vital foods that enhance growth and development of the infant but may not know their importance to nutrition.

The definition of health to which individuals subscribe may influence the extent to which they engage in health-promoting behaviours, (Pender & Pender, 1996). The prevailing definition of health within the medical community is "absence of illness". The public redefines health as a positive construct rather than a negative one, the nature of behaviours directed toward maintaining health should also change, (Pender & Pender, 1996). The mother may not realise that the infant has poor nutrition depending on how she defines poor health.

Perceived benefits of health promoting behaviours in this study include the benefits of breast-feeding, benefits of other options of infant feeding, for example it is advantageous to give thick porridge to infants above 6 months because they provide a lot of energy to the infant.

Perceived barriers to health promotion behaviours include domestic violence, tradition, lack of knowledge, poverty, lake of social support and infection of the mother. Cues to action include health education and counselling by the nurse. The nurse's roles as a teacher or educator, counsellor, researcher, communicator, advocator will play a major part in promotion of health. Also information can be generated from mass media which is a source or cues for action through programs about personal health, family health and environmental concerns, according to Pender and Pender 1996.

Conceptual Definition of Terms

Modifying Factors

These are a category of determinants of a person's health promoting behaviour, which include demographic factors, interpersonal; influences and situational factors (Pender & Pender, 1987).

Health promotion are activities directed towards the development of resources that maintain or enhance an individual's well being (Pender & Pender, 1987).

Cognitive – Perceptual factors are referred to as individual of primary motivational mechanics for acquisition and maintenance of health behaviours (Pender & Pender, 1996).

Situational Factors

Situational factors refer to knowledge of available options that increase the knowledge on nutrition,(Pender & Pender, 1987).

Interpersonal Influences

These are interactions with health professionals which have an influence on health promotion (Pender & Pender, 1987).

The Definition of Health.

The definition of health refers to the personal meaning of health (Pender & Pender, 1987). The personal meaning of health may predict how mothers interpret the weights of their infants for example an overweight infant may be considered as health by the mother. It is possible that defining health as adaptation or stability would

predispose individuals toward health promoting behaviours directed toward avoiding illness and disease (Pender & Pender, 1987, p63).

Perceived Barriers

Perceived barriers has been identified as a cognitive perceptual factor which exerts a direct influence on predisposition to engage in health promotion behaviour (Pender & Pender, 1987). Perceived barriers in this study refers to poverty, lack of knowledge, religion and poor feeding practices.

Nutrition (also called nourishment) is the provision, to cells and organisms, of the materials necessary (in the form of food) to support life, (WHO, 2006). Nutrition in this study is the variable of interest, which depend on infant feeding practices. In Health Promotion Model individual characteristics (personal factors and prior related behaviour) affect behaviour. That is to say practices like when breastfeeding was initiated bears an influence on nutrition.

Infant feeding practices are feeding options and activities undertaken by mothers to meet the infants nutritional needs, WHO (2004).

Infant is a person from 1 month to twelve months of age, (WHO, 2005)Exclusive breast-feeding is when an infant receives only breast milk and no other liquids or solids, not even water, with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines, (WHO, 2006)

Research Objectives

The study sought to:

1. To identify the infant feeding practices that are commonly used by mothers attending Family Child\Health Clinics at Marondera's three Urban Health Centres following exclusive breastfeeding.

2. To assess knowledge on infant nutrition, mothers possess.

3. To examine the relationship between knowledge on nutrition and infant feeding practices among mothers with infants 7 months to one year at Marondera Urban Health Centres.

Research Questions

The study sought to answer the following questions:

1. Which infant feeding practices are commonly used by mothers attending Family Child Health Clinics at Marondera three Urban Health Centres following exclusive breast feeding?

2. What knowledge do mothers possess on infant nutrition?

3. What is the relationship between knowledge on infant nutrition and infant feeding practices among mothers with infants 7 months to one year at the three Urban Health Centres?

Significance to Nursing

Significance to nursing is associated with the study's importance to nursing body of knowledge, (Polit & Hungler, 1999). The investigator hoped that this study would provide some knowledge on nutrition in relationship to infant feeding practices. Mothers would gain knowledge on foods to give to their infants after weaning them from the breast. Also the nurses/midwives will gain more knowledge on the subject matter.

In nursing practice the midwives may assist to identify gaps in information given to mothers during infant feeding counselling. As nurse/midwifery practitioners are equipped with this new information, the quality of nursing care will also be improved as they will carry out research based practice. This will help in coming up with individualised nursing care plans for patients in midwifery.

In nursing administration, the new information derived from this study will help in formulation of policies and circulars. In addition to that the study is significant to nursing administration because it will help to fill in gaps of knowledge and equip managers with vital information with regards to infant feeding practice.

Any new findings may prompt follow up research thereby expanding the body of knowledge in nursing.

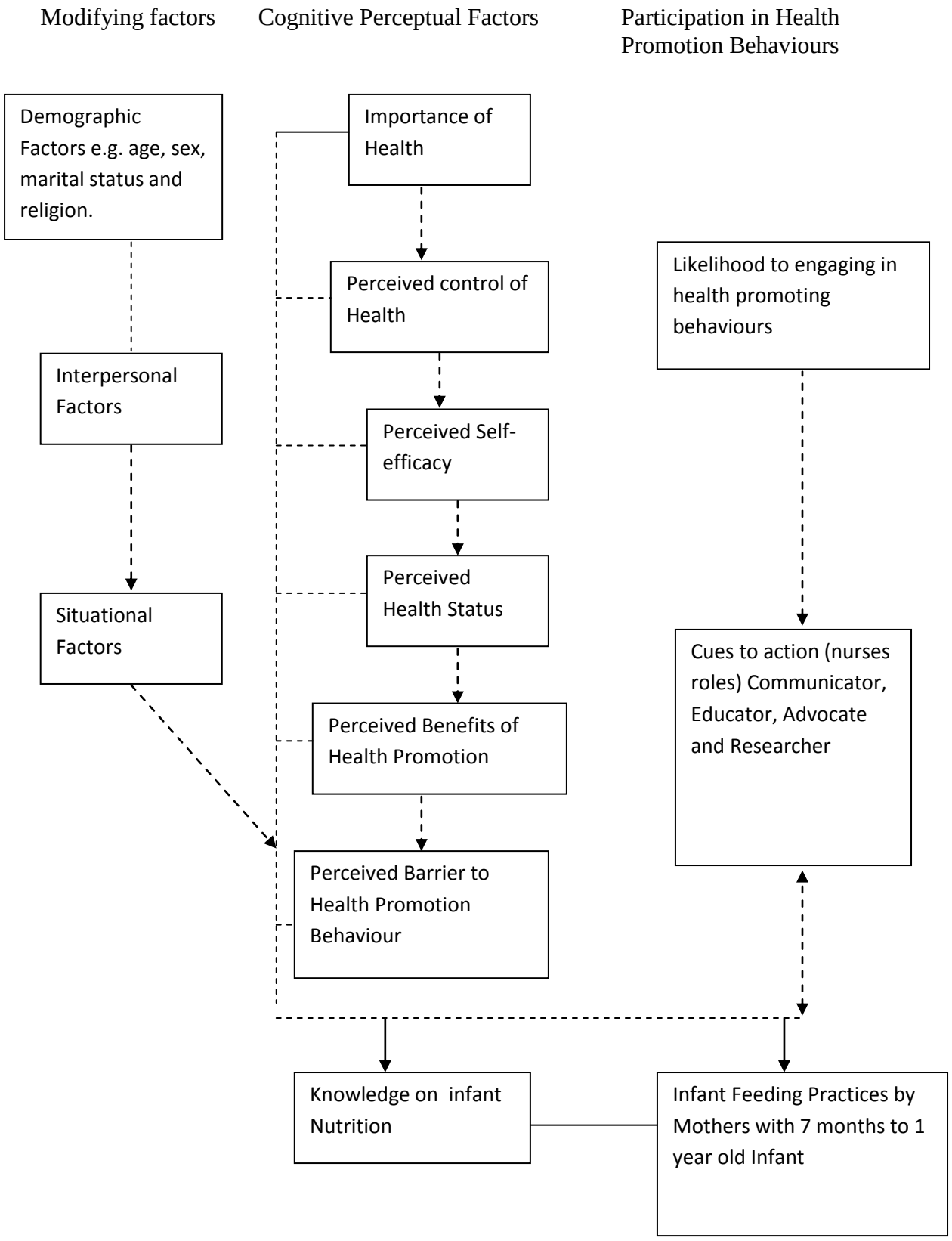

Figure 1. Adopted and adapted from Health Promotion Model by Pender and Pender 1996.

CHAPTER 2

LITERATURE REVIEW

Introduction

Polit and Beck (2006) state that literature review is a review of those activities in which the investigator becomes involved in the topic, thus developing a comprehensive picture of what is presently known on that topic. This chapter will review literature on knowledge on infant nutrition, infant feeding practices, the relationship between knowledge on nutrition and infant feeding practices. Studies where Health Promotion Model by Pender and Pender (1996) was used to find relationship, will be discussed with regards to nursing researches that have used it as the theoretical framework to assess relationship.

WHO (2006), defines malnutrition as the end result of poor nutrition and frequently emotionally deprivation by carers who, because of poor understanding, poverty or family problems are unable to provide the child with good nutrition and the care he or she requires. The Ministry of Health and Child Welfare (MOHCW) (2005), described a malnourished child as a child whose weight –for-age was below the third percentile on the Zimbabwe Child Health Nutrition Card or – 3 Standard Deviation (SD) to – 4 Standard Deviation (SD). Good nutrition is whereby the infant is able to get a balanced diet according to the food square, (WHO, 2005).

Infant Feeding Practices

Adequate nutrition is critical to child's health and development. The period from birth to two years of age is particularly important because of rapid growth and brain development that occurs during this time (USAID, 2006).

The Infant and Young Child Feeding Module, (WHO 2007) provides indicators for children 6-23 months. Feeding practices included in this update are related to breastfeeding practices, feeding solid and semi-solid foods to breastfed and non-breastfed children, micronutrient intake, and feeding during diarrhea (USAID, 2006). The investigator wanted to identify the feeding practices that are commonly used by mothers attending Family Child/Health Clinic in Marondera three Urban Health Centres after exclusive breast feeding for 6months.

Being underweight was associated with 3, 7 million deaths worldwide in the year 2000, and most of the deaths occurred in children younger than 5 years old, (MOHCW, 2005). Poor feeding practices such as those that provide insufficient nutritional balance or contribute to diarrhea, are a major cause of low weight and morbidity and mortality in children, (USAID, 2007).

Kashaija (2008) states that it is important to note that the practice that impedes or facilitates exclusive breastfeeding begins in the health facility where the infant is delivered. To some extent health professionals support early initiation of breastfeeding. This is evidenced by the fact that most hospitals took up the Baby Friendly Hospital Initiative stance, which recommends initiating breastfeeding within half an hour.

In a study by Ntini (1998) at Mpilo Central Hospital, Zimbabwe, on an exploratory study of caregivers characteristics, infant nutritional knowledge, practices and resources which influence the nutritional status of children under five years, a sample size of 60 caregivers was determined to be adequate based on a power analysis. The study consisted of caregivers of children aged 5 years and below brought to hospital for growth monitoring, immunization and those admitted with severe malnutrition and other ailments. However, in the study the researcher did not

indicate the type of sampling done. Mothers' knowledge would improve the nutritional status of children hence it needed emphasis. The results revealed that slightly more than eighty-four percent of children weighed 250 grams and above at birth, whilst on admission to the nutrition village and by the time of the study almost all of them (98.3%) were below weight for age. A majority of the children (58.6%) were being admitted to a health institution for the first time. Many of the children (70.7%) were no longer breast feeding. On general activity level 53% were reported to be quite active.

Pfute et al (2007), on factors associated with malnutrition among the under fives in Chunga, Binga District, the sample size was 128 children under five years. Convenient sampling of participants in the order they presented themselves at the clinic was done. These children were brought by parents and others by guardians. So literature reveals that in order to access infants aged 7 to 12 months, they need to be brought to hospital during growth monitoring and vaccination, or for treatment of other ailments. Pfute et al (2007) in a study, factors contributing to Malnutrition, obtained a written informed consent before children were weighed and parents interviewed. Weight-for-age was the nutrition indicator used. Demographic information was extracted from health card using a checklist and a pre-tested interview administered questionnaire.

WHO (2006) recommends daily weights for severely malnourished infants. It is useful to mark the point that is equivalent to -1SD (90%) of the median NCHS/ WHO reference values for weight-for-height on the graph. The usual weight gain is about 10-15g/kg per day.

In Pfute et al (2007) study, it appeared they were not worried about the method of infant feeding, which was used. That is to say whether it was exclusive breast feeding, infant feeding formula, animal milk, breast heat milk, wet nursing or other home- made feeds from the family's staple food. In the study the researchers were not worried on whether the mothers and caregivers knew about the factors, which contributed to malnutrition despite identifying these factors. The investigator thinks that mothers and caregivers would benefit from the knowledge and guard against those factors to prevent malnutrition. Therefore, this study seeks to examine the relationship between knowledge on malnutrition and infant feeding practices.

A study on improved breastfeeding practices by Homana (2003) postulated that education stressing the overall benefits of breast milk enables mothers, including those who were HIV positive, to evaluate relative risks and benefits and still make the health choice of exclusive breastfeeding. Zambia Integrated Health Program, Horizons (2005), found out that clinic attendants who were exposed to the intensive counseling, increasingly adopted the safer practice of exclusive breastfeeding and the riskier practice of mixed feeding declined. Exclusive breastfeeding rates were found to be high at baseline but were confirmed in a separate validation study and were probably the result of breastfeeding promotion programs in Ndola preceding the Ndola Demographic Project. The exclusive breastfeeding rate among mothers in the community who did not know their HIV status rose from 57 percent at baseline to 70 percent at end line, (Horizons, 2005). This trend implies that even as women's understanding of MTCT (Maternal to Child transmission) during breastfeeding improves, good breastfeeding practices are not being eroded. Researchers found no significant differences between the practices of women who knew their HIV status and those who had not been tested. Results of this study indicated that all mothers

were moving away from mixed feeding toward giving breast milk exclusively for the first six months. Early cessation of breastfeeding and feeding exclusively by replacement remained low.

According to this Ndola Demographic Project study (2005), both HIV positive and HIV negative women practiced exclusive breast-feeding. Also it appears the women had information on exclusive breast-feeding. The researcher would like to find out which feeding practices are commonly used by mothers after exclusive breast-feeding.

WHO (2008) recommends that for the average health infant, meals should be provided 4 to 5 times per day, with additional nutritious snacks (such as pieces of fruit or bread) offered 1-2times a day, as desired. Also the appropriate number of feedings depends on the energy density of the local foods and the usual amounts consumed at each feeding.

MOHCW (2005) states that feeding the infant frequently, 5-6 times a day with health snacks like bread with peanut butter, fruits, and milk provides the infant with nutrition.

In another survey by the National food and Nutrition Commission of Zambia (2005) a general household survey was carried out with 209 mothers of infants less than six months old recruited from the community. At a baseline, a "snowballing" method was used whereby respondents were asked to identify other mothers of infants less than six months old within the neighborhood. In this Zambian study at midterm and end line, mothers of infants less than six months old were selected for interviews by sampling from a census undertaken in the project areas. This more rigorous sampling methodology was adopted to improve the validity and increase the sample size. At least if mothers are able to identify other mothers who were doing exclusive

breastfeeding it shows that they had information. These mothers were staying within a radius of ten kilometers from the health centres. Those who were within 5 kilometers radius were at an advantage as compared to those who were within a radius of 10 kilometers from the health centre (National Food Bulletin, 2006).

Horizons (2003) identified some feeding practices as mixed feeding, exclusive breast feeding, and exclusive replacement feeding/milk only, exclusive replacement feeding /other feeds. The researcher in trying to identify which feeding practices the mothers engaged on would be able to note any changes in infant nutrition.

Ndola Demographic Project (2003) provided counseling to all mothers, regardless of knowledge of HIV status, to begin gradually introducing appropriate complementary foods while continuing to breastfeed. The results indicated that mothers of infants 6 months to 12 months old had knowledge of foods that can be used to enrich infants diet among community mothers of infants age 6 to 12 months, mother knew some of the foods. These were given as groundnuts, kapenta, (fish) soup, milk, sugar, salt, cooking oil, fruit egg and soya.

Deshpande and Gazmararian, (2005) suggested that health plans and employers may promote breast feeding by providing breastfeeding education and support. A study to identify factors associated with the initiation and duration of breast feeding in managed care enrollees who had had a normal vaginal delivery was carried out by (Deshpande & Gazmararian (2005). The findings were that those women who were more likely to breast feed were those who attended childbirth classes, those who received prenatal breast feeding advice, and those who received post partum breastfeeding assistance.

Ministry of Health and Child Welfare (2007) in Zimbabwe PMTCT module described exclusive breast feeding, exclusive breastfeeding with early cessation,

expressing and heat-treating breast milk as some of the practices in under 1 year nutrition. Also replacement feeding during the first 6 months of life, exclusive home modified animal milk and exclusive commercial infant formula were some of the feeding options described. Practices like hand washing before expressing breast milk, use of clean cup were also highlighted as some of the good practices. Exclusive breastfeeding also include ensuring that the baby is well attached to the breast so as to prevent breast problems, seeking medical care quickly when problems occur and practice safer sex during breastfeeding period and also initiating breastfeeding the first hour of life to facilitate milk flow are some of the practices which facilitates infant feeding, (Levine & Huffiman, 2005).

Bhandri (2008) states that families need clean water and fuel to wash and boil the cups and containers used to feed the baby and store the breast milk. This will prevent diarrhoea which may result in malnutrition. These are some of the good practices which promotes infant feeding. According to Tlou, and Shapiro, (2000) heat-treating breast milk is culturally unacceptable which prevents the mothers from using the option predisposing the infant to HIV.

Coutsoudis (2005) identified the components of the safer breastfeeding package were to encourage the following:- Exclusive breastfeeding up to 6 months and good lactation management (early initiation, attachment, positioning, frequent feeds, learning to express), To avoid mastitis, cracked nipples, Shorter duration of breastfeeding about 6 months, Condom use during lactation period, No feeding from breast with cracks, bleeding nipples or abscesses are other recommended practices. Milk can be expressed and discarded from affected side and continue feeding from unaffected side. Prompt treatment of infant oral thrush and heat treatment of expressed breast milk are other practices.

Knowledge on Infant Nutrition

Nutrition (also called nourishment) is the provision, to cells and organisms, of the materials necessary in the form of food to support life (WHO, 2006). Malnutrition has been responsible, directly or indirectly, for 54% of the 10.9 million deaths annually among children under five. Well over two-thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first year of life (WHO, 2006).

The Global Strategy for Infant and Young Child Feeding(2005) recommends that infants are exclusively breastfed for the first six months of life. There is need for the mothers to understand why breastfeeding is important so that they will not have doubts about the value of breast milk. The mothers also need to know the differences between breast milk and artificial milk, (WHO, 2006).

According to WHO and UNICEF (2006) Growth charts can reflect past and present conditions including food intake and health status. Another measurement which may be used is length or height. Length or height changes slowly and can reflect a child who is undernourished for long time. This is referred to as stunted or very short height for age.

Infant and Young Child Feeding Counseling, Participants Manual (2005), describe the growth charts in assessment of feeding practices. There are three curves on this chart. The upper curve shows the middle or median weight for healthy children of that age. It is also called the 50^{th} percentile because the weights of 50 percent of health children are below it and 50 percent are above it. Most healthy children are near this 50^{th} percentile curve, a little either above or below it. Only children whose weight is very far above this line are likely to be overweight. The next lower curve is the 3^{rd} percentile curve – the weights of 3 percent of healthy children

are below this curve. It is around the bottom limit of normal growing children. A genetically or naturally small child may be near this curve but still growing well. A child whose weight is far below the bottom line is not healthy and needs attention (WHO 2006).

As a result mothers need to know the progress of their infants and be on the watch out, when to seek help and what action to take. The level of education of the mother also contributes to the level of grasping some information on infant nutrition. However, when dealing with mothers it is always ideal to know the level of education so that one knows which level of information to give. The questions which the mother may be asked to assess the nutritional status of an infant, are;

"how was the infant fed for the first six months of life? what milk does the infant have now? what other feeds does the infant get now? how often does the infant eat? what types of food does the infant eat? who sleeps with the infant?'' (WHO and UNICEF, 2006)

Infant and Young Child Feeding Guidelines (2005) stated reliable signs that indicate that a baby is not getting enough milk as poor weight gain of less than 500 grams per month and also small amount of concentrated urine passed less than 6 times per day. The investigator in this study can use information about to fo rmulate a questionnaire on assessment of infant nutrition. Such questions as, how many times does the infant pass urine, may be asked.

Breast milk alone, exclusive breastfeeding should continue for the first six months of birth. From 6-12 months, breastfeeding continues to provide half or more of the child's nutritional needs, and from 12-24 months, at least one third of their nutritional needs. As well as nutrition, breastfeeding continues to provide protection

from many illnesses for the child and provides closeness and contact that helps psychological development, (MOHCW, 2006).

In this context the investigator wanted to assess whether mothers had information on the amount of nutritional needs from 6-12 months of age. Also the investigator wanted to assess what the infants were given.

In a study carried out in Binga District, by Pfute , Mpeta, Mabera, and Rusakaniko (2007), on factors associated with malnutrition among the under fives in the Chunga area, children were weighed and parents/care givers interviewed. Weight for age was the nutrition indicator used. Demographic information was extracted from health cards, using a checklist and pre-tested interview schedules. Pfute et al (2007) used the 24 hour recall method to obtain food consumption and feeding frequency levels. These levels were then compared with recommended levels given in the food square and sample meal plan guidelines for Zimbabwe. Data was captured and analyzed for frequencies using epi-info 3.3.2 package. Main outcome measures were food consumption levels, feeding frequencies, type of domestic water sources, type of sanitary facilities present and past infections and infestations (malaria, measles, ARI, HIV, diarrhoreal diseases among the under fives and intestinal parasitic infestations).

Evian (2006), recommends that complimentary foods should then be introduced, after four to six months. After six completed months, infants need to learn to eat thick porridge, puree and mashed foods as these foods fill the energy gap more than liquids. At this age infants show interest in other people eating and reach for food, like to put things in their mouth, can control their tongue better to move food around their mouth and start to make up and down munching movements with their jaw. In addition the digestive system are mature enough to begin to digest a range of foods (Infant and Young Child Feeding Counseling, 2005).

A full term baby is born with good stores of iron to cover their needs for iron for the first six months. Iron is needed to make new blood, assist in growth, and development and to help the body fight infections (Fraser & Cooper, 2003). This food component can be found in animal-source foods such as meat, organs/offals such as liver, heart and blood as well as yoghurt, cheese and eggs. Also some of the foods provide vitamin A. Infants can have this extra iron if only they are given these foods.

A study was carried out on nutritional monitoring by community volunteers undertaken by Bisinwa et al (2009), in the Democratic Republic of the Congo. The researcher concentrated on monitoring the growth of infants under 1 year of age. This result remains encouraging for a community program, but some health districts with good health coverage and good accessibility regularly weigh 70% to 80% of children under 1 year of age without a community based nutrition strategy (Bisinwa et al 2009).

This performance is often attributed to the fact that parents are sufficiently motivated to bring children in that age group for vaccination. Nutritional monitoring is carried out when the mother brings the child for vaccination, and monitoring is usually stopped between the 9^{th} and 10^{th} months, when the child has received the last vaccine according to the vaccine program in use in the Democratic Republic of the Congo (Bisinwa et al, 2009).Similarly in this study the investigator will be working with mothers whose infants are 7 months to 1 year of age brought for growth monitoring and nutritional monitoring. In order for mothers to bring their children they need motivation and education.

Smith, Ramakrishnan, Ndiaye, Haddad and Martorell (2006), stated that women with low status tend to have weaker control over household resources, tighter time constraints, less access to information and health services, poorer mental health,

and lower self-esteem. These factors are thought to be closely tied to women's own nutritional status and the quality of care they receive, and in turn ,to children's birth weights and the quality of care they receive.

According to Ministry of Health and Child Welfare (MOHCW 2005), when children are growing and developing they need a nutritious and balanced diet. Therefore, infants should be given food according to weight and height, and increase portion size as the child grows older. Feeding the infant frequently, 5-6 times a day with health snacks like bread with peanut butter, fruits, and milk, provides the infant with nutrition. Giving energy dense food, enriching porridge with beans, peanut butter, milk, oil or sugar also improves nutrition. Serving children in individual plates and encouraging each infant to finish its share to monitor the amount of food taken improve nutrition (WHO, 2006). Such information would enable the investigator to formulate a questionnaire on patterns of feeding. That is, what the infant feeds on, whether the infant feeds in an individual plate. Also the investigator would establish on how often the infant feeds. Infant feeding practices are feeding options and activities undertaken by mothers to meet the infants nutritional needs WHO (2005).

Smith et al (2006) stated that women's status makes by far the greatest contribution to the regional gap in children's nutritional status. In the interest of sustainably improving the nutritional status of children, women's status should be improved in all regions. They went on to discuss that accomplishing of this task requires policies that eradicate gender discrimination and policies that reduce power inequalities between women and men by proactively promoting catch-up for women.

Relationship Between Knowledge on Infant Nutrition And Infant Feeding Practices

Infant and Young Child Feeding Project (2006) states that USAID is recognized as an innovator in establishing that adequate nutrition is critical to child survival and development, with the period from birth to two years of age being particularly important because of the rapid growth and brain development that begins during this time. Within the period of 6-24 months of age, a sharp increase in malnutrition occurs, the time when poor feeding practices, including the transition from exclusive breastfeeding to a mixed diet, including complementary foods, take their toll.

In this section the investigator would like to assess the relationship between nutrition and infant feeding practices. Infant and Young Child Feeding is viewed as part of a continuum of nutrition and health practices critical for improved growth and survival that begins during pregnancy and continues through at least the first two years of life.

WHO (2006) states that as part of estimating food and nutritional needs, specific interventions are required during emergencies to protect and promote optimal infant and child feeding practices. These interventions should be routinely included in any relief response and should be sustained throughout the period of response.

At 6 months of age, infants should start to receive complementary foods, in addition to breast milk. These should be safely prepared from locally available foods that are rich in energy and micronutrients to meet the infants' changing nutritional requirements, (UNICEF, 2006).

Information provided to mothers on the use of complementary foods (including fortified products) needs to be conveyed in a way that supports continued,

breastfeeding and encourages optional feeding practices, including responsive feeding, (Kathryn G. Dewey and Sandra L. Huffman, 2009).

In a story from Botswana Case Study (2005) Margaret, a nursing sister gave her infant gripe water because the infant was restless, crying and groaning. She and other family members believed that the infant had some colic. Water was given to the infant at times. Later Margaret attended a 5 day Baby and Mother Friendly Hospital Initiative (BMFHI) course as her hospital was being assisted to become Baby and Mother Friendly. During the course Margaret gained new knowledge and skill on breastfeeding, (Morewane, 2005). Knowledge on nutrition and infant feeding practices have a relationship because mothers are given information which they can actually practice to improve the nutritional status of their infants.

Theoretical Framework

Pender's (1987) Health Promotion Model defines health promotion as activities directed towards the development of resources that maintain or enhance an individual's well-being. In the study this relates to the nutrition provided to the infant to promote growth and development.

Jill and Jill (2003) did a study on an exploratory study of caregivers characteristics, nutritional knowledge, practices and resources which influence the nutritional status of children under one year, using the Health Promotion Model by Pender (1999), and observed that health education is a pre-requisite in all health promotion programs. Health promotion provides a basis for individual health choices and it is consistent with concepts of self-reliance and primary health care that the mothers who knew what is best for their babies' health would prefer choosing

exclusive breastfeeding. Maternal knowledge of nutritional principle is perceived as a determinant of infant feeding option (Hoff, 2000).

Dennis, Blue, Stahl, Benge and Shaw (2005), on self-care knowledge and readmissions among chronic heart failure clients used Pender's Health Promotion Model. The investigator looked at the effect of a close follow up of chronic heart failure clients by a nurse and a primary care physician beginning before discharge and continuing for 6 months after discharge. Clients in the treatment group had significant higher rates of readmissions although they received more intensive primary care. The rates of readmission in the treatment group was 0.19 compared to 0.14 in the control group. Patients in the treatment group also had more hospital days (10.2) days compared to 8.8 days of the control group. The patients comprised of severely ill chronic heart failure clients who were hospitalized so often. Mukona (2008) studied on relationship between level of knowledge of antiretroviral therapy (ART) and the rate of adherence to (ART) among human Immunodeficiency virus (HIV) positive adults on ART using the model. The results revealed that the effect of the independent variable (level of knowledge of ART) accounts for 40% of the variance in the dependent variable (rate of adherence to ART). Beta (.639) represents a change in the rate of adherence to ART for every unit change in the level of knowledge of ART. The importance of level of knowledge in this study, therefore, was 63.9% in terms of its contribution to the rate of adherence to ART. The level of knowledge of ART has a positive influence on the rate of adherence to ART.

Summary

This chapter looked at literature on knowledge on infant nutrition, infant feeding practices and the relationship between infant feeding practices and knowledge on infant nutrition. It also looked at the Theoretical Conceptual Framework by Pender and Pender (1999). Studies which used Pender's theoretical conceptual framework were identified. These included a study by Jill and Jill (2003) on an exploratory study of caregivers characteristics, nutritional knowledge, practices and resources which influence the nutritional status of children under one year. Another study was by Dennis, Blue Stahl, Benge and Shaw (1996) in USA on self-care knowledge and readmissions among chronic heart failure clients. Both the studies revealed relationships.

CHAPTER 3

METHODOLOGY

Introduction

This chapter described the methodology of the study under the following headings, research design, sampling plan, sample size, sample procedure, operational definition of variables, research instrument, data collection plan, human rights considerations, data collection procedure and analysis. According to Polit and Hungler (2004) research methods, are steps, procedures, and strategies for gathering and analyzing the data in a research investigation.

Design

A Research Design is a blueprint for conducting a study. Research Design like the architect's set of blueprints, guides the course of a piece of research by addressing processes such as sample selection, data analysis and a schedule to guide the sequence of events of the research process. Research does follow the logic of empiricism and design is a key element in the success or failure of the study outcome (Polit and Hungler, 2006). The investigator in this study resorted to using the descriptive correlational design to examine the relationship between knowledge on infant nutrition and infant feeding practices. A correlational research is research that explores the relationships among variable of interest without any active intervention on the part of the researcher (Polit & Beck, 2006). In addition to the above, a descriptive correlational design examines if variables co-vary, quantify the strength, or relationship between the variable and also shows the positive or negative direction of the relationship determined (Burns, 2005). The descriptive correlational research

design has an advantage of gaining new facts in the natural setting (Treece & Treece, 1999). In this study, the design assisted in describing the variables and correlating the relationship between the dependent variables and the independent variable.

Study Site

The three study centres in Marondera urban, with two of them under the Municipality of Marondera, one under government, that is Marondera Hospital. In all the three urban health centers is a department for Family Child Health where weighing and treatment of the under fives is done. These centers open from Monday to Friday every week. Also counseling on infant feeding, antenatal care and postnatal care are some of the activities offered in these units. Family planning services are also offered. At all the three urban centres chosen for this study, the under fives clinic opened from Monday to Friday from 8 am to 3pm.

Sampling Plan

Polit and Hungler, (2006) defines a sampling plan as a process of selecting a portion of the population to represent the entire population. The quality of the sample for quantitative studies is a function of how typical or representative the sample is of the population with respect to the variables of concern in the study. The sampling plan included selection of a sampling method, selection of a sample size and selection of procedures for recruiting the study participants (Polit & Becker, 2006). The target population comprised of mothers with their infants aged 7 months to 1 year old coming for growth monitoring and vaccination. In this study the investigator used probability sampling design.

The subjects were entered into the study after simple random sampling. The investigator identified her subjects first by going through a register where they were

entered then allocated them numbers. The investigator then picked those who had even numbers, after picking the first subject with small papers in a hat. The age of the infants was 7 months to 1 year old.

Probability sampling is useful for descriptive and correlational studies conducted in a new area of research, (Polit & Hungler, 1999). In this study Pearson's Products Moment Correlation Coefficient (r) was used to analyze the relationship between knowledge on infant nutrition and infant feeding practices among mothers with infants 7 months to 1 year following exclusive breastfeeding. A relationship existed hence, regression analysis was done (R^2).

Sample Size

Wikipedia Free Encyelopedia (2007) states that the sample size of a statistical sample is the number of observations that constitute it. The determinants of sample size are power, effect size and significance level, variance of the phenomenon statistical test assumptions and potential attrition rate. The study was a descriptive correlational study, power became the determining factor for the sample size. The minimum acceptable power for a study was .80. Power controlled the likelihood of a type II error whereby an investigator failed to reject a null hypothesis that is not true (Polit & Hungler, 2006). The effect size is the extent of the presence of a phenomenon and it is important in determining sample size and the accepted effect size is .50 (Polit & Hungler, 1999). The effect size is a strong index which shows how strong the level of knowledge on infant nutrition is on infant feeding practices. Significance level is the probability that an observed relationship could be caused by chance (Polit & Beck, 2006)

A significance level of .05 was used to calculate the sample size. A sample of 80 was selected based on estimated tables by Cohen (1999). This was achieved through using power, effect size and significance level. A sample of 80 participants was drawn which included 65 plus 20% attrition rate of 13. The attrition rate was calculated as 65 multiplied by 20 divided by 100 is 13. Then 65+13=78, which was rounded off to 80.

Sampling Procedure

Probability sampling was used in this study. Those who were reachable are the mothers who are motivated to bring their infants for growth monitoring or those who were not well. Available subjects were randomly selected and entered into the study until the desired sample size was reached (Polit & Hungler, 1999). Available subjects were taken from the register where they are entered as they come. They were randomly selected and entered into the study until the desired sample size was reached Numbers were slotted in a hat with even numbers. The aim was to have the K^{th} number which was the first even number, that is 2. Then the small paper was returned. The investigator slotted 10 small papers numbered 1 to 10 then took the even numbers only. This implied that 5 subjects were selected on each turn. When they were through the process continued and another 5 subjects were picked.

Inclusion Criteria

According to Burns and Grove (2005) inclusion criteria includes the essential characteristics of the target population so as to achieve homogeneity, control extraneous variable and also provide a guideline for sample recruitment. Those included in this study were mothers and their infants aged 7 months to 1 year old,

who had practised exclusive breast feeding, and had introduced other foods after exclusive breast feeding.

Exclusion Criteria

Polit and Hungler (2006) stated that exclusion criteria are characteristics that the study participants must not possess to be eligible. Study participants who could not speak English and Shona were excluded from this study because there was a barrier in communication. Mothers with very ill infants were excluded due to ineffective responses and also those with infants above one year were excluded.

Variables

Dependent variable

It is the outcome variable of interest, the variable that is hypothesized to depend on or be caused by another variable. In this study, it was infant feeding practices.

Independent Variable

It is the variable that is believed to cause or influence the dependent variable, in experimental research, the manipulated (treatment) variable. Knowledge on infant nutrition was the independent variable.

Demographic Variables

These relate to personal characteristics of the mothers and their infants who are the investigator's study participants. Maternal age, level of education, occupation, income marital status, parity, number in a household sharing same kitchen, religion, culture, sex of infant and age of infant are some of the demographic variables.

Conceptional and Operational Definitions

Infant Feeding Practice

The dependent variable is infant feeding practices among mothers whose infants are aged 7 months and 1 year old. This was measured by determining which infant feeding practices the mothers are well versed with. The mother's knowledge of good practices were assessed. This included age at which child is introduced to other foods, initiation of breastfeeding, knowledge of feeding options after 6 months of age, other feeding practices.

Knowledge on Infant Nutrition

Knowledge on infant nutrition is the independent variable which influences infant feeding practices among exclusively breast-fed infants. Nutritional status of the infant was determined by checking the trend of the infants growth on the standard growth monitoring card, in Zimbabwe. Questions to find out what other milks the infant is getting besides other foods following weaning were asked. How the infant feeds and with whose assistance was important to assess the nutritional status of the infant.

Demographic Data

In the demographic data questionnaire are items addressing, demographic characteristics such as age, marital status, parity, level of education, occupation and religion.

Instrument

An instrument is a written device that a researcher uses to collect data (for example questionnaire, tests, observation schedules) (Polit and Beck, 2006). The

investigator used a questionnaire in this study to collect data by means of issuing the questionnaire. It was an advantage to use a questionnaire because, Polit and Beck (2006) states that a questionnaire enables the investigator to be consistent in asking questions and makes the data easy to analyze. Therefore, it was appropriate for this study because data was coded and analyzed in order come up with results. The instrument was partitioned into 3 categories namely, demographic data, knowledge on infant nutrition and infant feeding practices.

Demographic Variable

Item 1 to 12 comprises of demographic data on the mother who is the client to answer the questionnaire. Questions pertaining to age, marital status, number of children, level of education, sex of infant, age of infant, occupation, earnings per month, number of household members sharing the same pot, religion, and who delivered the mother, were asked. No scoring was awarded on demographic data since the data obtained were continuous variables such as age, and some of it was categorical such as boy or girl.

Infant Feeding Practices

Questions 13 to 21 assessed infant practices which are carried by mothers after weaning their infants following exclusive breastfeeding. Questions like which method of feeding are being used, and age at which infant was weaned were assessed to identify if the mother had some counseling. Distance from the health centre was assessed to find out if there was a problem in accessing health care due long distances from the health facilities. Knowledge on whether giving cooking oil was helpful, whether exclusive breast feeding was accepted in one's family, whether thick food was difficult for an infant to digest, knowledge on preheating breast milk and washing of hands was assessed. Indicators for infant feeding practices include formulas, wet

nursing, animal meat, breast milk and heated breast milk. Low scores were those which were below the mean, moderate scores were those above the mean to 29 and high scores were from 30 to 42.Total score for infant feeding practices was 42

Knowledge on Infant Nutrition

The knowledge on infant nutrition was assessed using questions 21 to 30. This included analysis of infants weights following direction of the line showing child's growth. Also questions like how many times the infant feeds, how many times the infant passes urine, what are the advantages of exclusive breast feeding, knowledge on balanced diet and knowledge on infant nutrition was assessed. Other questions were what exclusive breast feeding meant, whether thick foods give energy to infants, why breast milk is best milk for the infant the first days of life and when exclusive breast feeding was initiated. Low knowledge was rated as below the mean, moderate knowledge was from above the mean to 33,and high knowledge was rated from 34 to 38. The total score was 43.

Pilot Study

A pilot study is a small-scale version, or trial run, done in preparation for a major study. (Polit & Hungler, 1999). Likewise a pilot study was done to pretest the instrument and to determine the feasibility of the study. Eight subjects were chosen for this pilot study and amendments were done on the instrument. The investigator took note and avoided including the same subjects for the pilot study in the major study to reduce bias. Adjustments were made to the instrument to ensure reliability and validity. Some of these adjustments had medical terms which the participants could not understand. These questions were rephrased with the assistance of the supervisor. Other adjustments were made with assistance from experts working in MCH department.

Reliability

Reliability is the degree of consistency with which the instrument measures the attitudes, that is getting the same reading of same objects at different times (Polit & Hungler, 1995). The investigator developed an instrument basing on (Infant feeding Module, 2007). Reliability of this instrument was tested during a pilot study. No psychometric tests were done since it is a new instrument.

Validity

Validity is the degree to which an instrument measures what it is supposed to measure (Polit & Hungler, 1995). Content validity was measured by giving the instrument to midwives in FCH, (panel of experts) and supervisors' to judge if content was correct, adequate and acceptance with regards to information being elicited on infant feeding guidelines. Some adjustments were made especially on phrasing questions avoiding medical terms for better understanding.

Data Collection Plan

Burns and Grove (1997) postulates that a data collection plan details how the study will be implemented and it is specific to the study being conducted. Permission to collect data was sought from Medical Research Council through Department of Nursing Science. Arrangements were made with the Provincial Medical Director Mashonaland East, for permission to collect data from Marondera Urban Centres. Questionnaires were self-administered and collected by the investigator during weekdays between 0900 hours to 1500 hours since the departments open from 09.00 to 15.00 hours. This was done from 22nd March to 20th April, 2010. Data collection plan considered procedures to be used to collect data, time and cost of data collection, developing data collection forms and developing a code-book (Burns & Grove, 2005).

Human Rights Considerations

Permission to carry out the study was sought from the bottom manager to the highest level. That is to say from the sister-in-charge of the units, matrons, medical superintendent, the Provincial Medical Director, Nursing Science Department and from the Medical Research Council of Zimbabwe (MRCZ). This was done to protect the participants. All prospective subjects voluntarily participated in the study. The subjects were assured of confidentiality of results and purpose of study risks, and benefits of the study were explained. Explanation that the study subjects were chosen because of the required criteria was be given. The investigator informed the prospective subjects that they could withdraw any time they wished to do so without any ill effects. They were also told about use of the codebook and assigning numbers other than names to promote anonymity. Time frame for the questionnaire was given as 20 minutes for each participant. Subjects were allowed to ask questions and after they agreed to become subjects they signed the consent form.

Data Collection Procedure

Data collection is the gathering of information needed to address a research problem (Polit & Hungler, 1999). Data was collected through use of a questionnaire which was issued by the investigator. Data was collected from 09.00 to 15.00 hours because this was the time when the FCH was functional. The subjects were chosen from the register they were entered when they reported to the FCH department and made sure that their infants are 7 to 1 year old and had exclusive breastfeeding. The investigator created a good rapport with the prospective study participants by introducing herself to them, her purpose of visit and sought for permission to distribute questionnaires to them. Upon agreement the subjects signed the consent form. The questionnaires were issued daily from Monday to Friday for four weeks,

and from 0900 hours to 1500 hours. A codebook was devised to serve as convenient documentation way of confidentiality and used during data analysis. Also the data was locked up in a lockable handbag and a lockable cupboard.

Data Analysis Plan

Data analysis is the systematic organization and synthesis of research data, and the testing of research hypotheses using those data (Polit & Hungler, 1999). Norusis (2005) also defines data analysis as determining what conclusions are justified on the data. In this study data was entered into a codebook after transforming the data into numerical symbols that could be easily entered into the computer. Statistical procedures were employed to analyze the data using statistical package of the Social Sciences (SPSS) system and the Microsoft excel program. This helped to test the relationship between infant nutrition and infant feeding practices.

Demographic Variables

In this study demographic variables described the sample under study as age, sex, marital status, level of education, employment, income, mode of delivery, where delivered, number of household members sharing same kitchen, parity, HIV-status and culture/religion, sex of infant. Age was analyzed using descriptive statistics and presented using mean, range, mode, frequencies and percentages of the study participants. For the rest of the demographic variable were analyzed using frequencies and percentages.

Infants Feeding Practice

Dependent variable is infant feeding practice and it used descriptive statistics. The investigator sought to identify feeding practices that are commonly used by mothers attending Marondera urban health centres after exclusive breastfeeding.

Descriptive statistics (frequencies and percentages) were used to analyze data obtained following responses from participants.

Knowledge on Infant Nutrition

This is the independent variable which used descriptive statistics. The investigator assessed information mothers have on infant nutrition and assessed the nutritional status of infants 7 months to 1 year old. The findings were presented in form of a table using frequencies and percentages. The overall findings were analyzed using descriptive statistics, which are the mean, range, mode, frequencies and percentages, as well as standard deviation.

Relationship Between Knowledge on Nutrition and Infant Feeding Practices

Inferential statistics were used to assess the relationship. The investigator examined the relationship between knowledge on infant nutrition and infant feeding practices among mothers with infants 7 months to one year at three Marondera urban health centres. Pearson's Product moment correlation test was employed to determine if there is a relationship between nutrition an infant feeding practices and inferential statistics permit one to infer or generalize whether the relationship observed in a sample are likely to occur in larger population of concern. The correlation coefficient is an index that measures the strength or magnitude and direction of a linear relationship, (Polit & Beck, 2006). The investigator proceeded to carry out a regression analysis (R^2) because there was a significant correlation. This helped to examine the extent of the influence of knowledge on nutrition, on infant feeding practices. Clegg (2006) states that if two measures are in perfect association there is a perfect positive correlation denoted by (+1). No association between two variables

means there is no correlation denoted by (0). The more there is one variable, the less there is another. This implies that there is a negative correlation denoted by (-1).

CHAPTER 4

RESULTS

Summary

The purpose of the study was to determine the relationship between knowledge on infant nutrition and infant feeding practices among mothers with 7 months to 1-year-old infant at Marondera's three urban centres.

The study sought to answer the following questions:

1. Which are the infant feeding practices commonly used by mothers attending Family Child Health Clinics at Marondera three urban health centres following exclusive breast feeding?
2. What knowledge do mothers possess on infant nutrition?
3 What is the relationship between knowledge on infant nutrition and infant feeding practices among mothers with infants 7 months to 1 year at Marondera three urban centres.

Pender's Health Promotion Model was used as framework to guide study. The response was 100%. Data was collected by means of questionnaires which were distributed to subjects. Data was collected from the 16th March to 31st March 2010. The data was analyzed using SPSS version 11 and Microsoft Excel. Descriptive statistics were used to analyze frequencies, means, modes, medians and percentages of knowledge on infant nutrition and infant feeding practices. The study was carried out in March 2010 with 80 subjects through simple random selection. Pearson's product moment correlation coefficient (r) was used to determine the presence or absence of

the relationship between knowledge on infant nutrition and infant feeding practices, as well as the nature of the relationship (whether linear, positive, negative or inverse).

Simple regression analysis was used to examine the strength of the effect of level of knowledge on nutrition and infant feeding practices because the results were not significant.

Sample Demographics

Table 1 shows demographic data of the subjects' age. The age range was between 15 and 40 years. The mean age was 26,04 and standard deviation was 5.86, the mode was 20, and the median was 25.00.

Table 2 shows marital status, number of children one has, educational level, and sex of infant. They were 69 (86.3%), 6 (7.4%) were single, 3 (3.8%) were divorced and 2 (2.3%) were widowed. On level of education 8 (10%) had attained primary level, 61 (76.2%) had attained secondary level and 11 (13.8%), tertiary level. On number of children those with one infant were 36 (45%), 24(30%), had two children, 16(20%) had three children, and 4 (5% had four or more children. The sex of infants of mothers in the study was 47 (58.8%) boys and 33 (41.2%) girls. Mean age of infants was 10.20 months, median 11.00, mode 12, standard deviation 1.8 and range was7 to 12 months. Nine (11.3%) were 7 months old, 10(12.5) were 8 months old, 8(10%) were 9 months old, 12(15%) were 10 months old, 11(13.8%) were 11 months old and 30(37.4%) were 12 months old.

Table 3 shows data on occupation, earnings per month, and household members who share the same family pot. Those who were not employed were 49 (61.3%), professionals were 14 (17.5%), general workers 7 (8.8%), domestic workers 4 (5%), self-employed 6(7.5%) Among those who were employed 12 (15%) had a salary b $150 to $200 US dollars, 10 (12.5%) got below $100 US dollars. 3 (3.8%) earn $200 to $300 US dollars, 2 (2.5%) earn above $500 US dollars and 1 (1.3%) earn $300 to $500 US dollars. Thirty-five (43.8%) shared same family pot in a household of three, 19(23.8) shared same family pot, 15(18.8%) shared same family pot and 10 (12.5%) also shared same family pot.

Table 4 shows demographic data on mode of delivery of infant, religion of the mother , and information on who assisted the delivery. Seventy-three (91, 2%) were born through normal vertex delivery, 6(7.5%) were born by Caesarean section, no infants were born through vacuum extraction, and 1(1.3%) were born through breech presentation. Seventy-five (93.8%) were christians, 4(5%) follow the traditional way, 1(1,2%) was a moslem and none from the apostolic faith. Fifty-seven (71.2%) were delivered by nurses/midwives, 11(13.8%) were delivered by doctors/obstetricians, 10(12.5%) were delivered by traditional birth attendant and 2(2.5%) delivered themselves.

Table 1 Sample Demographics (1)

(N=80)

Variable	Frequency	Percentage
Age		
15	1	1.3
18	4	5.0
19	1	1.3
20	10	12.5
21	5	6.3
22	2	2.5
23	7	8.8
24	8	10.0
25	7	8.8
26	5	6.3
27	2	2.5
28	4	5.0
29	3	3.8
30	4	5.0
31	2	2.5
32	2	2.5
33	3	3.2
34	1	1.3
35	1	1.3
36	2	2.5
37	1	1.3
38	3	3.8
40	2	2.5
Total	80	100.0

Table 2 – Sample Demographics (2)

(N=80)

Variable	Frequency	Percentage
Marital Status		
Single	6	7.5
Married	69	86.2
Divorced	3	3.8
Cohabiting	0	0.0
Widowed	2	2.5
Separated	0	0.0
Number of children one has		
One	36	45.0
Two	24	30.0
Three	16	20.0
Four or more	4	5.0
Educational Level		
None	0	0.0
Primary	8	10.0
Secondary	61	76.2
Tertiary	11	13.8
Age of infant in months		
7 months	9	11.3
8 months	10	12.5
9 months	8	10.0
10 months	12	15.0
11 months	11	13.8
12 months	30	37.4

Table 3 – Sample Demographics (3)

(N=80)

Variable	Frequency	Percentage
Occupation		
Housewife	49	61.2
Domestic Worker	4	5.0
Casual Worker	0	0.0
General Worker	7	8.8
Self-employed	6	7.5
Professional	14	17.5
Earnings		
Below $100 US	10	12.5
US $100 – US$ 150	6	7.5
US $150 – US $200	12	15.0
US $200 – US $300	3	3.8
US $300 – US $500	1	1.2
Above US $500	2	2.5
No income	46	57.5
Household members sharing same family pot.		
Three	35	44.8
Four	19	23.8
Five	15	18.8
Above 5	10	12.6

Table 4 – Sample Demographics (4)

(N=80)

Variable	Frequency	Percentage
How did you deliver your infant?		
Normal Vertex delivery	73	91.2
Caesarean section	6	7.5
Vacuum extraction	0	0.0
Breech	1	1.3
Religion		
Christianity	75	93.8
Traditional	4	5.0
Moslem	1	1.2
Apostolic Faith	0	0.0
Who delivered you?		
Nurse/Midwife	57	71.2
Doctor/Obstetrician	11	13.8
Traditional birth attendant	10	12.5
Self	2	2.5

Infant feeding Practices

Tables 5, shows data on questions such as, at what ages respondents they weaned their infants, 4(5%) indicated that they weaned their infants at 7months, 25(31,3) at six months, 4(5%) at five months, 5(6.3%) at four months, none of them weaned her infant at 3months.

On the question, 'how are you feeding your infant', 38(47.5%) were getting breast milk and other supplements, 1 (1.3%) heat treated milk, 9 (11.2%) breast milk 14 (17.5%) formula feeding, 14 (17.5%) cow's milk, and 3 (3.7%) goat's milk, 1 (1.3%) was giving any other foods.

On getting education on infant feeding, 43(53.8%) of the participants had received some counselling from health care providers on infant feeding. Sixteen (20.0%) indicated that at times would get counselling, 11 (13.8%) stated that they did not get counselling , 10 (12.4%) never got any counselling at all.

Table 6 shows data on how far away one is away from the health centre, giving cooking oil can be helpful in the first 6 months, exclusive breast feeding first 6 months is acceptable, and thick foods cause constipation. Fifty (62.5%) stayed within 3 km from the health centres, 13 (16.3%) stayed within 4 km, 11 (13.8%) stayed within 5km, and 6 (7.4%) within above 5km.

Thirty-three (41.3%) strongly agree on giving infants cooking oil, 29 (36.2%) strongly disagreed, 10 (12.5%) neither agreed or disagreed, 8 (10.0%) agreed somewhat.

Exclusive breast-feeding the first 6 months was acceptable among 41 (51.2%) mothers, and not acceptable among 27 (33.8%) mothers, 6 (7.5%) agreed somewhat, and 4 (5.0%) neither agreed nor disagreed, disagree somewhat 2(2.5%).

Thirty-three(41.3%) participants had the belief that thick food can cause constipation, 29 (36.3%) participants agreed that thick food would not cause constipation. Two (2.3%) disagreed somewhat, 11 (13.8%) neither agreed nor disagreed, 4 (6.3%) agreed somewhat.

Table 7 shows data on breast milk can be preheated before giving to infants, and how often one washes her hands. Thirty participants (37.5% strongly disagreed that breast milk could be preheated before being given to the infant. Twenty-two (27.5%) neither agreed nor disagreed, 21 (26.3%) strongly agree and 5 (6.3%) agreed somewhat, 2 (2.5%) disagreed somewhat.

Washing of hands whenever they are dirty was reflected by 62 (77.5%) subjects, 12 (15.0%) indicated that they would wash their hands before handling food, 5 (6.3%) would wash their hands when they feel like doing so. One (1.3%) specified that after changing infant nappy, before and after eating, after toilet and before preparing food.

Table 8 shows total scores on the dependent variable, Infant Feeding Practices. The mean for these scores is 22.48, median 23.00, mode, 21, standard deviation 5.27, and range was 10 to 33. Thirty-nine subjects scored above average and 41 scored below average.

Table 9 shows data on subjects with low utilisation, 17(21.1%), moderate utilisation 59(74.0%) and high utilisation 4 (4.9%).

Table 5 – Infant Feeding Practices (5)

(N=80)

Variable	Frequency	Percentage
At what age did you wean your infant?		
At 7 months	4	5.0
At 6 months	25	31.3
At 5 months	4	5.0
At 4 months	5	6.3
Before 3 months	0	0.0
Other	42	52.4
What are the advantages of exclusive breast feeding?		
The infant gets enough nutrients	36	45.0
Encourages growth and development	22	27.5
Increases milk flow	6	7.5
Predisposes the baby to HIV	3	3.8
I don't know	13	16.2
How are you feeding your infant now?		
Heat treated milk	1	1.3
Breast milk	9	11.2
Formula feeding	14	17.5
Cow's milk	14	17.5
Goat's milk	3	3.7
Mixed breast and artificial feeding	38	47.5
Others	1	1.3
Did you get counselling on infant feeding?		
Yes	43	53.8
At times	16	20.0
No	11	13.8
Not at all	10	12.4

Table 6 – Infant Feeding Practices (6)

(N=80)

Variable	Frequency	Percentage
How far away are you from the nearest health centre?		
3km	50	62.5
4km	13	16.3
5km	11	13.8
Above 5km	6	7.4
Giving cooking oil can be helpful in first 6 months		
Strongly disagree	29	36.2
Disagree somewhat	0	0.0
Neither agree nor disagree	10	12.5
Agree somewhat	8	10.0
Strongly agree	33	41.3
In my family exclusive breast feeding first 6 months is acceptable		
Strongly disagree	27	33.8
Disagree somewhat	2	2.5
Neither agree nor disagree	4	5.0
Agree somewhat	6	7.5
Strongly agree	41	51.2
Thick Foods cause constipation		
Strongly disagree	33	41.3
Disagree somewhat	2	2.3
Neither agree nor disagree	11	13.8
Agree somewhat	5	6.3
Strongly agree	29	36.3

Table 7 – Infant Feeding Practices(7)

(N=80)

Variable	Frequency	Percentage
Breast milk can be preheated before giving to infants		
Strongly disagree	30	37.5
Disagree somewhat	2	2.5
Neither agree nor disagree	22	27.5
Agree somewhat	5	6.3
Strongly agree	21	26.2
How often do you wash your hands?		
Whenever they are dirty	62	77.5
Before handling food	12	15.0
When I feel like doing so	5	6.3
Others	1	1.2

Table 8 – Total Scores on Infant Feeding Practices (8)

(N=80)

Variable	Frequency	Percentage
Scores out of 43		
10	1	1.2
11	1	1.2
13	2	2.5
14	1	1.2
15	5	6.3
16	1	1.2
17	5	6.3
18	3	3.8
19	5	6.3
20	4	5.0
21	10	12.5
22	1	1.2
23	2	2.5
24	5	6.3
25	8	10
26	5	6.3
27	5	6.3
28	7	8.8
29	4	5.0
30	1	1.2
31	2	2.5
32	1	1.2
33	1	1.2

Table 9 – Infant Feeding Practices (9)

(N = 80)

Variable	Frequency	Percentage
Low utilization	17	21.1
Moderate utilization	59	74.0
High utilization	4	4.9

Knowledge on Infant Nutrition

Tables 10 shows the data on independent variable of the study, which is knowledge on infant nutrition. This is data on infant's weight in relation to direction of arrow, urine output, and number of feeds per day. Three graphs were shown to subjects on growth of infants. Fifty-five (68.8%) had a good graph, 12(15.0%) had a dangerous graph, 13(16,2%) had a very dangerous graph.

On urine output, 1(1.3%) subject's infant passed urine once a day,5(6,3%) had infants who passed urine 3 times a day, 20(25%) passed urine 4 to 5 times a day and others 5(6.1%) had other views.

On number of feeds per day 2(2.5%) feed three times a day, 8(10,0%) feed their infants 4 times a day, 17(21.2%) feed their infants 5 times a day, 44(55.0%) feed their infants 6 times a days and 9(11.3%) gave other responses.

Table 11 show data on advantages of exclusive breast feeding, and when the subject initiated breast feeding. Thirty-six(45%) gave the answer that the infant gets enough nutrients, 22(27.5%) said it encourages growth and development, 6(7.5%) said it increases milk flow, 3(3.8%) gave an answer as it predisposes baby to HIV, 13(16.2%) did not know anything. Fifty-seven subjects (71.3%) had initiated breast-feeding within the first hour of birth, 12 (15.0%) after 2 hours of birth, 5 (6.2%) after 3 hours of birth, 2 (2.5%) after 5 hours of birth, 4 (5%) after 6 hours of birth.

Table 12 shows data on answers on what is exclusive breastfeeding, why breast milk is best for the infant first days of life, which foods are contained in balanced diet, and thick food give more energy to infant. Fifty-eight (72.8%) gave the answer as giving baby milk only, 7 (8.8%) indicated that it was breast-feeding on

demand, 1 (1.2%) revealed it as giving the baby breast milk substitutes and 14 (17.5%) did not know. On why breast milk best for the infant first days of life, 61 (76.3%) indicated that breast milk contains enough nutrients and antibodies, 4 (5.0%) indicated that baby likes it, 1 (1.2%) indicated that the milk is in abundance, 2 (2.5%) indicated that breast milk had no food value, and 12 (15%) did not know why breast milk is best for the first days of the infant.

The question on which foods are contained in balanced diet, 57(71.3%) gave foods contained in balanced diet as proteins, carbohydrates, vitamins, and fats, 12 (15%) indicated starch and proteins only, 11 (13.7%) stated vitamins, starch and vegetables, none of them gave vitamins only.

Thirty (37.5%) strongly agreed that foods that are thick enough to stay in the spoon give more energy to the child, 25 (31.2%) strongly disagreed, 16 (20%) neither agreed nor disagreed and 7 (8%) agreed somewhat 2(2.5%) disagree somewhat.

Table 13 shows total scores of the independent variable, knowledge on infant nutrition for 80 participants. The mean for these scores is 29.74, median 29.00, mode, 26 standard deviation 5.13, range was 17 to 38 scores.

Thirty-one participants scored below the average, 49 participants scored above the average.

Table 14 shows participants with low knowledge 8(10%), 56(70%) participants showed moderate knowledge, 16(20%) participants showed high knowledge.

Table 10 – Knowledge on Infant Nutrition (I0)

(N=80)

Variable	Frequency	Percentage
Infant's Weight		
Good	55	68.8
Dangerous	12	15.0
Very dangerous	13	16.2
Urine output		
Once	1	1.3
3 times per day	5	6.3
4 to 5 times a day	20	25.0
5 to 6 times a day	49	61.3
Other	5	6.1
Number of feeds per day		
3 times a day	2	2.5
4 times a day	8	10.0
5 times a day	17	21.2
6 times a day	44	55.0
Other	9	11.3

Table 11 Knowledge on Infant Nutrition (11)

(N = 80)

Variable	Frequency	Percentage
What are the advantages of exclusive breast feeding		
The infants gets enough nutrients	36	45
Encourages growth and development	22	27.5
Increases milk flow	6	7.5
Predisposes the baby to HIV	3	3.8
I don't know	13	16.2
When did you initiate breast feeding		
Within first hour of birth	57	71.3
After 2 hours of birth	12	15.0
After 3 hours of birth	5	6.2
After 5 hours of birth	2	2.5
After 6 hours of birth	4	5.0

Table12 – Knowledge on Infant Nutrition (12)

(N=80)

Variable	Frequency	Percentage
What is exclusive breastfeeding		
Giving baby breast milk only	58	72.5
Breast feeding on demand	7	8.8
Giving the baby breast milk substitutes	1	1.2
Giving the baby water and sugar	0	0.0
I don't know	14	17.5
Why is breast milk best for infant first days of life		
Contains enough nutrients and antibodies	61	76.3
Baby likes it	4	5.0
Is in abundance	1	1.2
Have no food value	2	2.5
I don't know	12	15.0
Which foods are contained in balanced diet?		
Starch and protein	12	15.0
Vitamins	0	0.0
Vitamins, starch, vegetables	11	13.7
Proteins, carbohydrates, vitamins, fats, minerals	57	71.3
Thick foods give more energy to infant		
Strongly disagree	25	31.2
Disagree somewhat	2	2.5
Neither agree nor disagree	16	20.0
Agree somewhat	7	8.8
Strongly agree	30	37.5

Table 13 – Total Scores on Knowledge on Infant Nutrition (I3)

(N=80)

Variable	Frequency	Percentage
Scores out of 42		
17	2	2.5
18	1	1.2
19	1	1.2
20	2	2.5
21	2	2.5
22	2	2.5
23	5	6.3
24	1	1.2
25	2	2.5
26	8	10.0
27	5	6.3
28	6	7.5
29	6	7.5
30	6	7.5
31	6	7.5
32	3	3.8
33	6	7.5
34	4	5.0
35	6	7.5
36	1	1.2
37	4	5.0
38	1	1.3

Table 14 – Knowledge on Infant Nutrition14

(N=80))

Variable	Frequency	Percentage
Low knowledge	8	10
Moderate knowledge	56	70
High knowledge	16	20

Relationship between Knowledge on Nutrition and Infant Feeding Practices

Pearson's correlation coefficient analysis was used to examine the relationship between knowledge on nutrition and infant feeding practices, by mothers at Marondera three urban health centres. After computing the Pearson's correlation coefficient the relationship was found to be a weak one and positive, that is .259. The significance level was .05. in other words r=.259, p=< .05. The results show that as knowledge increased, the infant feeding practices also improve. A positive sign on the correlation coefficient would mean that the two variables increase together.

Regression analysis was done because the results were significant. R^2 is .067, expressed as 6.7%. The results implies that the effect of the independent variable, (knowledge on nutrition) accounts for 6.7% of the variance in the dependent variable (infant feeding practices). The F-Statistic is used for testing the significance of R^2. The significant F-test (.020) indicates a linear relationship and that R^2 is significant. F=5.625, p=.020. The T-test for the unstandardized regression coefficient (b=.253) is significant at .020. It also explains that the model is adequate in explaining the infant feeding practices. The b (.253) represents a change in the dependent variable (infant feeding practices) with / for every unit change in the independent variable (knowledge on nutrition). Beta represents an average change in infant feeding practices for a unit change in knowledge on nutrition and is significant at .020. The bigger the value of significant (b) the more important in terms of its contribution to infant feeding practices. The importance of level of knowledge in this study, therefore, was 25.3% in terms of its contribution to the rate of infant feeding practices. The level of knowledge of nutrition has a positive influence on infant feeding practices.

Table 15 shows the Pearson's correlation coefficient indicating the relationship between knowledge on nutrition and infant feeding practices.

Table 16 shows regression analysis results which were computed after the results were found to be significant.

Table 15

Pearson's Correlation Matrix

(N = 80)

	Y
	1.000
X	.259*

*P< .05	**p< .01	***p< .001

Y – Infant Feeding Practices

X – Knowledge on Nutrition

Table 16

Regression Analysis

N=80

Variance	B	SEB	Beta	`Sig
X	.253	107	.259*	.020
Constant	23.053	2.459		
R^2=.067		F=5.625		.020

X- Knowledge on nutrition

CHAPTER 5

DISCUSSION, IMPLICATIONS AND RECOMENTIONS

Summary

The purpose of the study was to examine the relationship between knowledge on nutrition and infant feeding practices among mothers with infants 7 months to one year at Marondera's three urban health centres. The sample consisted of eighty subjects. A descriptive correlational study design using probability sampling, that is systematic sampling was done. The investigator sought to assess the knowledge mothers had on nutrition, identify the infant feeding practices that are commonly used by mothers attending Family Child Health Clinics at Marondera's three urban health centres, and the relationship between infant feeding practices and knowledge on infant nutrition.

The demographic data included age, marital status, number of children, level of education, occupation, monthly earnings, and religion.

The dependent variable was infant feeding practices. It was measured by a questionnaire with structured questions. The highest attained score was 33 out 42 and the lowest attained score was 10 out of 42. The mean score was 22.48, standard deviation 5.27, mode 21, median 23.00, and range was 10 to 33. Three categories used were low, moderate and high. The low category was reflected by 17(21.1%) subjects and moderate was reflected by 59(74%) subjects and high was reflected by 4(4.9%) participants. Scores 10 to 21 were rated low scores, and scores 34 to 38 were rated high scores.

The independent variable was knowledge on infant nutrition and was measured by use of a questionnaire with structured answers and scores allocated to various answers by participants. The highest attained score was 40 out of 43, and the lowest was 17 out of 43. The mean was 28.74 standard deviation 5.13, mode 26, median 29, range of scores was 17 to 40. Three categories, low, moderate, and high were also used to rate the dependent variable. Eight (10%) participants had low knowledge on nutrition, 56(70%) participants had moderate knowledge on nutrition and 20(16%) of participants had high knowledge on infant nutrition.

The relationship was examined by inferential statistics. Pearson's product moment correlations coefficient was used to analyse the relationship between knowledge on nutrition and infant feeding practices among mothers with infants 7 months to 1 year old at Marondera's three urban health centres. The results revealed a weak positive significant relationship, r=.259*, at 0,05 level of significance. Regression analysis was used to examine the strength of the relationship between the level of knowledge on nutrition and infant feeding practices. The effect of the level of knowledge on nutrition is indicated by R squared .067, F =5.625, b=.253. The effect of level of knowledge on nutrition is 6. 7% of the variance in infant feeding practices. The relationship shows that not only knowledge can influence the infant feeding practices but there are other factors involved which need investigation.

Discussion and Implications

Sample Demographics

The subjects involved in the study were aged 15 to 40 years with a mean of 26.04, median 25.00, mode 20, standard deviation 5.86. The results reflected the age group which is among the reproductive age and teenage pregnancy were revealed in the results. Also the age ranged from 15 to 40 years which was generalisable. According to MOHCW (2006),this age group is among the reproductive age.

The majority of the women had attained up to secondary level 61(76.2). Some 11(13.8) had attained up to tertiary level. A few indicated that they had attained up to primary level, 8(10%). Thinking in terms of women empowerment this is a very good achievement and one would talk about 90% empowerment. The only controversial issue is despite 90% empowerment, the majority of these participants are not employed as indicated by 49 (61.3%) of them. One would wonder why the situation is like this and would also seek to assess whether the secondary level indicated was a full certificate or not. According to Smith et al, (2006), women with low status tend to have weaker control over household resources, tighter time constraints, less access to information and health services, poorer mental health and lower self esteem. These factors are thought to be closely tied to women's own nutritional status and the quality of care they give, and in turn, to children's birth weights and quality of care they give. The low status could be due to low income or no income.

The majority of the subjects in the study had no income denoted by 46(57.5). This implied that their infant feeding practices were limited due to lack of money. This was followed by 10(12.5%) who earned below $100 to $150, 3(3.8%) who

earned $200 US to $300 US, 2(2.5%) which is also very little in relation to basic needs for infant nutrition. Even if the subjects had knowledge on infant nutrition they could not engage in recommended infant feeding practices due to inadequate financial support. Those who earned above $500 US, 2(2.5%) those who earned $300 to $500 US, was only 1(1.3). Looking at the figures on the amount earned monthly it reflects that the minority of the participants are in managerial positions. These are, those earning $300 to $500US and those earning above $500 US, denoted by 3(3,7) out of 80 (100%). Such a scenario can reduce the status of women in society. Smith et al (2006) stated that women's status makes by far the greatest contribution to regional gap in children's nutritional status. In the interest of sustainably improving the nutritional status of children, women's status should be improved in all regions. They went on to discuss that accomplishing of this task requires policies that eradicate gender discrimination and policies that reduce power inequalities between women and men by proactively promoting catch-up for women.

Some families 34(44.8%) had three members in a household, 19(23.8%) had four members in a household, 15(18.8%) had five members in a household and 10(12.6) had above 5 members in a household. This could have a negative impact on the availability of food to feed infants. Despite the knowledge on infant nutrition one might have acquired, it becomes impossible to meet the standard infant feeding practices when the food is inadequate.

Some subjects had delivered through normal vertex delivery 73(91.2%) and most of them 57(71.2%) and 11(13.8%) were delivered by midwives (nurses) and obstetricians(doctors) respectively. Six(7.5%) delivered by caesarean section and 1(1.3%) delivered by breech presentation. Ten (12.5%) were attended by traditional

birth attendants and 2(2.5%)delivered themselves. Kashaija (2008) states that it is important to note that the practice that impedes or facilitates exclusive breastfeeding begins in the health facility where the baby is delivered. To some extent health professionals support early initiation of breastfeeding. Most hospitals took up the Baby Friendly Hospital Initiative stance which recommends initiating breastfeeding within half an hour. This is a way of promoting breast feeding. In some cases religion affects one's behaviour.(Kashaija,2008). Most participants stated that they were Christians 75(93.8%), hence with Christians there are few beliefs relating to infant nutrition.

Infant Feeding Practices

On the question , at what age did the participant wean her infant, 4(5%) weaned their infants at seven months, 25(31.3%) weaned at six months, 4(5%) weaned their infants at 5 months,5(6.3%) weaned off their infants at 4 months, others 42(52.4%) weaned their infants 8 months to 1 year 8 months. Coutsoudis (2005) recommends weaning of infants at six months following exclusive breastfeeding especially to HIV positive mothers.

However, mothers may find it difficult to stop breast-feeding earlier than the norm , and it is, therefore, important to prepare mothers considering early cessation of breast-feeding to be given sufficient preparation and support (Coutsoudis, 2005), through information on knowledge of infant nutrition.

The question on feeding options , the participant is practising,1(1.3%) was using heat treated milk, 9(11.2) were using breast milk, 14(17.5%) were using formula feeding, 14(17.5%) were using cows' milk, 3(3.7%) were using goat's milk,

38(47,5%) were using mixed breast and artificial feeding and others 1(1.3%) used any other method. Ministry of Health and Child Welfare (2007) in Zimbabwe PMTCT module, recommends exclusive breast feeding with early cessation, expressing and heat treating breast milk as some of the practices in under 1 year nutrition. Also replacement feeding during the first 6 months of life, exclusive home modified animal milk and exclusive commercial infant formula are some of the feeding options described. So mothers are aware of the feeding options and choose what is suitable, acceptable and what they can afford. The issue still goes back the status of women in society as Smith (2006) puts it that, women's status makes by far the greatest contribution to regional gap in children's nutritional status. If there is no money to buy food the women cannot engage in approved infant feeding practices.

The issue on whether mothers get some counselling on infant feeding revealed that the majority of the participants 43(53.8%) had information delivered to them on infant feeding. Sixteen(20%) at times got some counselling, 11(13.8%) did not get counselling and 10(12.4%) never any counselling. Ndola Demographic Health Project (2005) provides, counselled all mothers, on complimentary feeding regardless of knowledge of HIV status. The results indicated that mothers of infants 6 to 12 months old had knowledge of foods that can be used to enrich infants diet among community mothers and they knew some of the foods. According to Horizons (2005), clinic attendants who were exposed to intensive counselling, increasingly adopted the safer practice of exclusive breast feeding and the riskier practice of mixed feeding declined. In relation to knowledge on infant nutrition and infant feeding practices, as knowledge increases practices improves. This implies that there is a change in infant feeding for

every unit change in the level of infant nutrition. In other words it means that knowledge on nutrition has a positive influence on the infant feeding practices.

Distance away from the nearest health centre revealed that 50(62.5%) are within 3km away from the health centre, 13(16.3%) are 4km away from the health centre, 11(13.8%) are 5km away from the health centre, 6(7.4%) are above 5km away from the health centre. National Food and Nutrition Commission of Zambia (2005) carried out survey with 209 mothers. These mothers were staying within a radius of ten kilometres from the health centres. Those who were within 5km radius were at an advantage as compared to those who were within a radius of ten kilometres from the health centre. As a result mothers may fail to attend under fives clinic due to distance away from the health centre and lack of transport.

The question was whether giving cooking oil was helpful in the first 6 months. Twenty-nine (36.2%) strongly disagreed with the idea, no one disagreed somewhat, 10(12,5%) neither agreed nor disagreed , 8(10%) agreed somewhat, 33(41.3%) strongly agreed. In analysing the frequencies and percentages, the majority of the participants were for this idea , and automatically it revealed that they had practiced it. A study on improved breast feeding practices by Homana (2003), states that education stressing the overall benefits of breast milk enables mothers, to evaluate relative risks and benefits and still make the health choice of exclusive breast feeding. However, in this current study, mothers have knowledge on improved feeding practices but they still believe that giving cooking is helpful. The results of the study reveals that as knowledge increases the mother's infant feeding practices improved. On the other hand not only knowledge can influence the infant feeding practices but there are other

factors involved. For instance the subjects under study were in the low income bracket hence, they might have limited resources to practice approved infant feeding practices.

The question on, in my family breast feeding in the first 6 months is acceptable was the concept. Twenty-seven (33.8%) strongly disagreed, 2(2.5%), disagreed somewhat, 4(5%) neither agreed nor disagreed , 6(7.5%) agreed somewhat, 41(51.2%) strongly agreed. In families there are significant others who hold the 'executive' powers and have a final say in certain issues. As a result pressure from executive members in family can bear a negative or positive impact on the infant's nutrition.

On the idea of thick foods causing constipation, 33(41.3%) strongly disagreed, 2(2.3%) disagreed somewhat, 11(13.8) neither agreed nor disagreed, 5(6.3%) agreed somewhat, 29(36,3%) strongly agreed. USAID (2006), states that feeding practices included in this update are related to breast feeding practices, feeding solid and semi-solid food to breastfed and non breastfed infants, micronutrient intake, and feeding during diarrhoeal episodes. The statement supports that solid foods are good for infants. Infant and Young Children Counselling (2005), states that, after six completed months, infants need to learn to eat porridge, puree and mashed foods since these foods fill in the energy gap more than liquids. In addition the digestive system is mature to digest a range of foods, hence the idea of constipation is out ruled by this statement. Also UNICEF (2006), states that at six months of age infants should start to receive complimentary foods in addition to breast milk. These should be safely prepared from locally available foods that are rich in energy and micronutrients to meet the infant's changing nutritional requirement.

Breast milk can be pre-heated before giving to infants, was a cause of concern. Thirty (37.5%) strongly disagreed, 2(2.5%) disagreed somewhat, 22(27.5%) neither

agreed nor disagreed, 5(6.3%) agreed somewhat, 21(26.2%) strongly agreed. According Tlou and Shapiro, (2005), heat-treating breast milk is culturally unacceptable which prevents the mothers from using the option. The majority of participants 30 (37.5%) strongly disagreed to the idea. Also 22(27.5%) were caught in between. They did not know whether they should agree or disagree. On the other hand the MOHCW (200) describes heat-treating breast milk as among the practices in under 1 year nutrition. So , when clients are given this information they are left in a dilemma because culturally they are bound to something which makes it not practical.

Answering the question on when one washes her hands, 62(77.5%) stated that whenever they dirty , 12(15%) stated that before handling food, 5(6.3%) said whenever they feel like doing so, and others 1(1.2%) gave all the answers above. Practices like hand washing before expressing breast milk, using clean cup, were also highlighted as some of the good practices (Levine &Huffiman,2005). Washing of hands whenever necessary promotes health through prevention of diarrhoea to the infant which will result in reduced absorption and malnutrition.

Knowledge on Infant Nutrition

Infants whose mothers were involved in the study had different patterns of graphs according to their monthly weights. A good graph on the infant's card increased as the infant grew, and these were 55(68.8%). Some had a dangerous graph, which remains static, at the same level despite the infant's advancement age wise 12 (15%) and the remainder 13(16.2%) had a very dangerous graph which continued to drop below 3rd percentile. Infant weighing monitors infant's weight which monitors infant nutrition, and mothers are aware of this measure and it motivates them to take their infants for weighing regularly at health centres. WHO, (2006) recommends daily

weights for severely malnourished infants and that it is useful to mark the point that is equivalent to -1 Standard Deviation (90%) of the median National Child Health Status /WHO reference values for weight-for –height on graph. According to WHO and UNICEF (2006), growth charts can reflect past and present conditions including food intake and health status. Also Infant and Young Child Feeding Counselling, Participants Manual (2005) described the growth charts in assessment of feeding practices. Three curves are on this chart.

The question on urine output was attempted by all participants. One participant indicated that her infant passed urine once daily, 1(1.3%). This sounds absurd because it showed severe dehydration. Urine flow diminishes as dehydration worsens. In severe dehydration no urine is formed (WHO, 2006). Five (6.3%) indicated that their infants passed urine 3 times per day and also this indicated some form of dehydration. Twenty (25%) indicated that their infants pass urine 4 to 5 times a day. Forty-nine (61.3%) stated that their infants passed urine 5 to 6 a day and others 5(6.1%) stated that their infants passed urine 7 to 9 times a day. These ones also stated that it depends with intake of fluids. The more fluids taken the more the urine output. Infant and Young Child Feeding Guidelines (2005) stated reliable signs that indicate that an infant is not getting enough milk as, poor weight gain of less than 500grams per month and also small amounts of concentrated urine of less than six times per day.

On number of feeds per day, 2 (2.5%) indicated that their infants fed 3 times a day and 8 (10%) indicated that their infants fed 4 times a day, 49(61.3%) revealed that their infants feed 5 times a day. Others who were among the remaining 5 (6.1%) stated they feed their infants per rising need. WHO (2008) recommends that for the average health infant, meals should be provided 4 to 5 times per day, with additional

nutritious snacks (such as pieces of fruit or bread) offered 1 to 3 times a day, as desired. Also the appropriate number of feeds depends on the energy density of the local foods and usual amounts consumed at each feeding. MOHCW (2005) states that feeding the infant frequently, 5 to 6 times a day with health snacks like bread with peanut butter, fruits, and milk provides the infant with nutrition.

On advantages of exclusive breast feeding, 36(45%) stated that infants get enough nutrients, 22(27.5%) stated that breast feeding encourages growth and development. Six (7.5%) stated that exclusive breast feeding increases milk flow, 3(3.8%) stated that breast feeding predisposes the infant to HIV and 13(16.2%) did not have any answer. In other words they did not know.

In the current study, on knowledge on infant nutrition and infant feeding practices, 57 (71.3%) subjects breast fed their infants within the first hour of birth, 12 (15%) breast fed their infants after 2 hours of birth, 5(6.2%) breast fed their infants after 3 hours of birth, 2 (2.5%) breast fed their infants after five hours of birth and 4 (5%) breast fed their infants after 6 hours of birth. Deshpande and Gazmararian (2005), suggests that health plans and employees may promote breast feeding by providing breast feeding education and support. A study to identify factors associated with the initiation and duration of breast feeding in managed enrolees who had had a normal vaginal delivery was carried out by these two. The findings were that those women who were more likely to breast feed were those who had attended childbirth classes, and those who received postnatal breast feeding assistance.

On the definition of exclusive breast feeding most subjects defined it correctly and this accounts for 58(72.5%) of participants. This matches with the majority of subjects who were delivered by nurses 57 (71.2%). This indicates that during their

encounter with nurses the participants get some counselling on infant feeding. Seven (8.8%) gave the definition of exclusive breast feeding as breast feeding on demand, 1(1.2%) defined it as giving the baby breast milk substitutes and 14 (17.5%) did not know how to define exclusive breast feeding.

The question on why breast milk is best for the infant first days of life, 61(76.3%) participants knew that colostrums contains enough nutrients and antibodies. Four (5%) stated that baby likes it, 1(1.2%) stated that it is in abundance, 2(2.5%) stated that colostrums had no food value and 12(15%) did not know. Fraser and Cooper, (2003) state that colostrum contains vitamin A, vitamin D, Vitamin E, vitamin K, water soluble vitamins and immune globulins as well as anti-infective factors.

Some subjects knew foods contained in a balanced diet 57(71.3%) were able to name all foods in the food square. Eleven (13.7%) gave a balanced diet as comprising of vitamins, starch and vegetables, and 12 (15%) stated a balanced diet contained starch and protein. MOHCW National Nutrition Unit (2005) defined healthy and balanced diet as one that provides the right foods in the right amounts and combinations and is safe and free from disease and harmful substances. A variety of foods that constitute a balanced diet are given starch food, protein sources, fats and oils, sugars and sugary foods, drinking lots of clean and safe water.

The question on whether thick foods give more energy to infants was given as 30(37.5%) strongly agreed to this concept, 25(31.2%) strongly disagreed, 16(20%) neither agreed nor agreed,7(8.8%)agreed somewhat 2(2.5%) disagreed somewhat. Infant and Young Child, (2006), clearly gives an illustration on how thick food is given as one of key messages in module.

Relationship between Knowledge on Infant Nutrition and Infant Feeding Practices

From the results of this study there is a positive weak correlation r=.259, p<.05.The results indicate that as knowledge on infant nutrition improves the mothers' capability to engage into approved practices also improves. While the results could be true, the weakness of the relationship shows that not only knowledge can influence the infant feeding practices but that there are other factors involved. Such factors like culture, can have negative impact on infant feeding practices. Tlou & Shapiro (2005) stated that heat-treating breast milk is culturally unacceptable and mothers will not use the option, thereby, exposing their infants to HIV infection. Eight (7.6%) of the participants had low knowledge on infant nutrition, 56 (70%) had moderate knowledge on nutrition and 16 (20%) had high knowledge.

Regression analysis was done to examine the strength of the relationship between the level of knowledge on infant nutrition and infant feeding practices. The significant R^2 supports that knowledge on infant nutrition explains 6.7% of the infant feeding practices that mothers engaged on. A significant positive effect (b=.253) of knowledge on infant nutrition improves infant feeding practices. The significant regression coefficient shows a change. The significant R^2 of .067 indicates that knowledge on infant nutrition explains 6.7% of variance on infant feeding practices. F=5.625 p<0.05. The adjusted R was .055. Beta (.253) represents a change in infant feeding practices for every unit change in the level of knowledge on infant nutrition. The significance (b) indicates the relative importance of the independent variable (knowledge on nutrition). The bigger the value of significant (b) the more important in terms of its contribution to the dependent variable (infant feeding practices). The importance of level of knowledge in this study, therefore , was .253 which is 25.3%

in terms of its contribution to the utilisation of infant feeding practices. The knowledge on infant nutrition has a positive influence on the infant feeding practices though it was an imperfect one.

Theoretical Framework

The Health Promotion Model by Pender (1987) provided the conceptual foundation for the study. The model consist of cognitive conceptual factors, modifying factors and cues to action. The model consists of two phases, that is infant feeding practices phase and knowledge level phase. These constructs in model represent the process an individual goes through during infant feeding practices. In this study the modifying factors were represented by the demographic factors like age, marital status, level of education, income, employment, religion and mode of delivery.

The modifying factors influence the cognitive factors consisting of the importance on health of the infant by mothers. Wallston, Maids and Wallston (1976), found that college students read more on health issues because they placed value on their health. Cognitive perceptual factors are equated to knowledge on infant nutrition. Perceptual control of health, perceived self-efficiency, perceived health status, perceived benefits of health promotion behaviour and perceived barriers to health promotion are other factors on cognitive perceptual factors. Perceived control of health is a factor whereby mothers control infant feeding practices to promote health. The mother acquires knowledge through learning from health care providers, peers, media, and literature if accessible. The second phase of the framework, the action is when the mother puts all the information, that is knowledge on infant nutrition and utilizes it to improve on infant feeding practices, thereby preventing malnutrition. Mothers' knowledge on nutrition showed that 56 (70%) had moderate knowledge and

16(20%) had high knowledge and 8(10%) had low knowledge. Also 1(1.3%) practiced heat treated milk, 9(11.2%) practiced breast, 14 (17.5%) practical formula feeding, 14(17.4%) cows milks, 3(3.7%) goat's milk, 38(47.5%) practiced mixed feeding and artificial feeding and others 1(1.3%). Tlou and Shapiro (2000) stated that heat-treating breast milk is culturally unacceptable. This prevents subjects, from using the option and it becomes a barrier to health promotion. The model suggested perceived barriers included were culture, finance and lack of knowledge. As a result mothers consider their demographic factors, situational and social-cultural factors by opting for other infant feeding practices, such as breast feeding which is natural.

Perceived benefits of health promoting behaviours in this study include the benefits of early weaning of infants from breast milk, benefits of breast feeding, benefits of other options of infant feeding, for example it is advantageous to give thick porridge to infants above 6 months because it provides a lot of energy to the infant. On interpersonal influences, interactions with health professionals have an influence on health promotion. For instance when the mother received health education or counselling from service providers, they benefit more information which will help them to improve their practices.

Although there was an imperfect positive correlation between knowledge on infant nutrition and infant feeding practices, it is considered a health promotion for the well being of infants. This study was based on the premise that health promotion activities are directed towards the development of resources that maintain and enhance an individual's life. Also the acquisition of knowledge on infant nutrition following infant feeding practices, the ability to implement and maintain it enhances an infant's

life and hopefully prevents malnutrition. In this study as knowledge on infant feeding increased, the infant feeding practices also improved.

Implications to Maternal Child Health/Midwifery Practice, Research and Education.

Midwifery /Nurse Practice

The results revealed that 8(10%) of the participants had low knowledge on infant nutrition, 56(70%) had moderate knowledge and 16(20%) had high knowledge. As an example, some subjects 12(15%) did not know why breast milk is considered the best for the infant first days of life. Also looking at which foods are contained in balanced diet, 12(15%) mentioned starch and protein, and 11(13.7%) mentioned vitamins, starch and vegetables. This reveals that mothers lack knowledge hence midwives have the obligation to teach these mothers for them to improve the infant feeding practices.

Education

Nurses and midwives need to be trained on infant feeding counselling, Prevention of Maternal To Child Transmission and other issues pertaining to maternal and child health. In turn this builds their confidence to give information to mothers. Community education offers hope as it opens doors to acceptability of some of the infant feeding practices not considered as culturally normal and thus reducing stigma attached to HIV infected people in communities. The midwives need to discourage poor infant feeding practices and encourage good practices to enhance good health. Midwives should have knowledge on policies which promote infant nutrition, for example Breast Feeding Policy. If the nurses and midwives are equipped with correct, current information. Giving correct information will clear misconceptions about infant

feeding practices. The provision of literature to read improves knowledge and it is high time nurses should have their nursing journals with current information. Mothers have a trust in nurses such that they are free to share their social issues and worries. They receptive to information given to them by health workers.

Research

The research finding have shown that only 6.7% of change in infant feeding was explained by knowledge on infant nutrition. This showed that as knowledge on infant nutrition increases, the mother's capability to engage in approved practices also improves. The relationship was weak because there are other factors which can influence infant feeding practices which include attitudes, culture, behaviour and beliefs. Further research would be of benefit to investigate other factors besides knowledge, that can affect feeding practices. A study needs to be carried out to assess whether older mothers have more information than young mothers. Nursing practice should be research based. This implies that there will be a link between practice and research. Research is aimed at improving practice , broaden understanding and provide a base for further research studies.

Recommendations

1. Further studies are recommended by way of replicating the present study using larger samples. There is need to find out what other factors cause poor infant feeding practices.

2. Midwives can benefit from field trips through learning from collegues on current issues and trends on infant feeding practices.

3. Tutors in midwifery schools need to be well equipped with current information on infant feeding practices and other issues related to maternal and child health. The tutors impart current knowledge to their students. More schools of midwifery will improve production of qualified staff for better services.

Limitations

The sample consisted of mothers from the urban setting mainly and a few from the surrounding farms. There were no representatives from the rural areas such that 50(62.5%) were within a radius of 3kilometres from the health centre, 13(16.3%) were within a radius of 4 kilometres from the health centre, 11(13,8%) lived within a radius of 5 kilometres from the health centre, and 6(7.4%) lived within a radius of above 5 kilometres. Results may be biased towards the urban mothers and not rural mothers. Replication of the study covering all setting allows generalisation of the results.

The study was carried out as partial fulfilment of the Masters Degree in Nursing Science. The time frame for the study was governed by the requirements of the course thereby reducing flexibility of the investigator. If more time was availed, the study sites could have involved more health centres within the province. The sample size could have been bigger than 80 participants. This would improve generalisability of the finding.

The instrument which was used had no psychometric tests done hence it had limited reliability and validity. The investigator carried out a pilot study and adjustments were made to the instrument to ensure validity and reliability. Some of these adjustments had medical terms which subjects could not understand. These questions were rephrased with the assistance of the supervisor and staff from language

department. Other adjustments were made with assistance from experts working in Maternal Child Health department. The data collection instrument was formulated by the researcher basing on literature review. Different languages were used, and the possibility that participants may interpret questions differently giving different answers were high.

Summary

Poor infant feeding practices contribute to infant morbidity and mortality. Infants continue to die despite the government effort in putting across strategies such as infant feeding and development of millennium goals 4, 5 and 6 which aim at reducing child mortality. One would wonder whether mothers have correct, current knowledge on infant nutrition, and which feeding practices they engage in.

The purpose of the study was to examine the relationship between knowledge on infant nutrition and infant feeding practices among mothers with infants 7months to one year at three urban health centres.

This study utilised Pender's Health Promotion Model to enhance understanding. In the model, individual characteristics (personal factors and prior related behaviour) influence behaviour, specific cognitions and affect, which will later influence behavioural outcome. The study used a descriptive correlational design to examine the relationship between knowledge on nutrition and infant feeding practices.

The sample included 80 participants aged between 15 and 40 years, who had infants 7 months to one year old. The study sample was selected using simple random selection which is a probability sampling method.

Data was collected using a questionnaire which was administered to subjects. The questionnaire comprised of three sections namely demographic variables, dependent variables and independent variables. The dependent variable was infant feeding practices, and the independent variable was knowledge on infant nutrition.

Data analysis was done by using descriptive statistics whereby there were mean, mode, range, standard deviation, frequencies and percentages. Inferential statistics involved Pearson correlation co-efficient, r=.259 at .05 level of significance.

Pearson correlation co-efficient was used to examine the relationship between the level of knowledge on infant nutrition and infant feeding practices. The effect of the level of knowledge on nutrition is indicated by R^2 was .067, F was 5.625, b was .253, and significance level .05, and it indicated a linear relationship. The effect of level of knowledge on infant nutrition is 6.7% of the variance in infant feeding practices Beta. (.253) represents a change in the level of knowledge on nutrition.

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Appendix A

Consent Form

The Relationship Between Nutrition and Infant Feeding Practices Among Mothers with Infants 7 months to 1 year old at Marondera Urban Health Centres.

I am Mercy Dorothy Tugwete, a Masters in Nursing Science student, studying at the University of Zimbabwe College of Health Sciences, carrying out a research study in fulfilment of requirements of the program I am undertaking.

I am kindly requesting for your consent to participate in this study. Information obtained from the study will be treated in confidence and no one else besides the investigator will have access to it, except for research purposes. Codes will be used instead of names to ensure confidentiality and protection of participants. The questionnaire will last approximately 20 minutes and you are free to withdraw from the study at any time. You are also free to decline to participate in this study and your decision will not affect the quality of care given to you in this health centre. The questionnaire includes questions on personal information, knowledge on nutrition and infant feeding practices following exclusive breast feeding. For any questions pertaining to this study, you can contact me during the week through the University of Zimbabwe College of Health Sciences, Department of Nursing Science telephone 04 – 791631 extension 2221. I have read (or this consent form has been read to me) and I have understood this consent form and voluntarily consent to participate in this study.

Subject's signature.....

Investigators'signature.....Date.....

Appendix B

Questionnaire

Item No:

Section A

Demographic Data

(This section relates to information about you).

1. How old are you? ☐
2. What is your marital status?
   - 1 Single ☐
   - 2 Married ☐
   - 3 Divorce ☐
   - 4 Cohabiting ☐
   - 5 Widowed ☐
   - 6 Separated ☐

3. How many children do you have?
   - 1 One ☐
   - 2 Two ☐
   - 3 Three ☐
   - 4 Four or more ☐

   Other (specify)

   ……
4. What is your level of education?
   - 1 None ☐
   - 2 Primary ☐
   - 3 Secondary ☐
   - 4 Tertiary ☐

5. What sex is your infant?
   - 1 Female/girl ☐
   - 2 Male/boy ☐

6. How old is your infant? ☐

7. What is your occupation?
   - 1 Housewife ☐
   - 2 Domestic worker ☐
   - 3 Casual worker ☐
   - 4 General worker ☐
   - 5 Self-employed ☐

6 Professional ☐

8. How much do you earn per month?

1 Below US$100 ☐
2 US$100 – US$150 ☐
3 US$150 – US$200 ☐
4 US$200 – US$300 ☐
5 US$300 – US$500 ☐
6 Above US$500 ☐

9. What is the number of household members who share the same family pot?

1 Three ☐
2 Four ☐
3 Five ☐
4 Above 5 ☐

10. How did you deliver your infant?

1 Normal vertex delivery ☐
2 Caesarean section ☐
3 Vacuum extraction ☐
4 Breech ☐

11.What is your religion?

1 Christianity ☐
2 Traditional ☐
3 Moslem ☐
4 Apostolic Faith ☐

Others (specify)

……

12.Who delivered you?

1 Nurse/midwife ☐
2 Doctor/obstetrician ☐
3 Traditional birth attendant ☐
4 Self ☐

Section B

Infant feeding practices

13.At what age did you wean your child?

1	At 7 months	5
2	At 6 months	4
3	At 5 months	3
4	At 4 months	2
5	Before 3 months	1

Others (specify)

……

14.How are you feeding your infant now?

1	Heat treated milk	6
2	Breast milk (wet nursing)	5
3	Formula feeding	4
4	Cow's milk	3
5	Goat's milk	2
6	Mixed breast and artificial feeding	1

15.Did you get teaching from health care providers in relation to infant feeding?

1	Yes	4
2	At times	3
3	No	2
4	Not at all	1

16.How far away are you from the nearest health centre?

1	3 km	4
2	4 km	3
3	5 km	2
4	Above 5km	1

Scale = 1 to 5; 1 = strongly disagree, 2 = disagree somewhat, 3 = neither agree nor disagree, 4 = agree somewhat and 5 = strongly agree).

Scale refers to questions 17-21.

17.Giving cooking oil can be helpful in the first 6 months

1	Strongly disagree	4
2	Disagree somewhat	3
3	Neither agree nor disagree	2
4	Agree somewhat	1
5	Strongly agree	0

18.In my family, exclusive breast feeding first 6 months is acceptable

1	Strongly disagree	0
2	Disagree somewhat	1
3	Neither agree nor disagree	2
4	Agree somewhat	3
5	Strongly agree	4

19.Foods that are thick enough to stay in the spoon are difficult for an infant to digest

1	Strongly disagree	4
2	Disagree somewhat	3
3	Neither agree nor disagree	2
4	Agree somewhat	1
5	Strongly agree	0

20.Breast milk can be preheated before giving it to an infant

1	Strongly disagree	0
2	Disagree somewhat	1
3	Neither agree nor disagree	2
4	Agree somewhat	3
5	Strongly agree	4

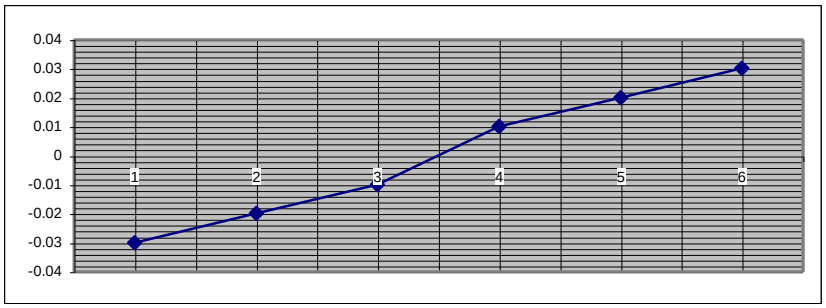
21When do you wash your hands?

1	Whenever they are dirty	4
2	Before handling food	3
3	When I feel like doing so	2

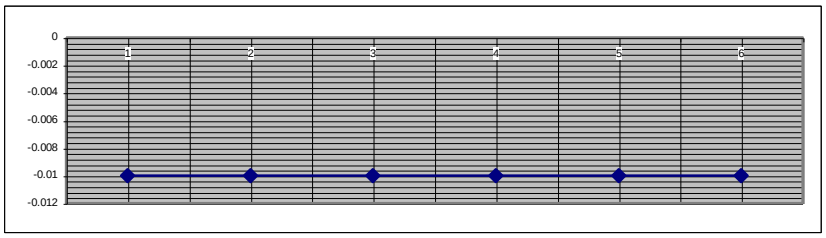
Other (Specify)

Section C.

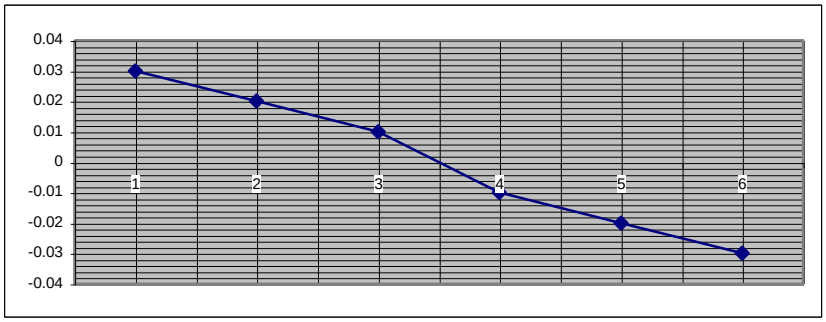
22.Knowledge on Nutrition: Below are graphs which show growth of an infant. May you please tick the graph similar to that on your infant's card.



Good 2



Dangerous 1



Very Dangerous 0

23.How many times does your child pass urine per day?

1	Once	1
2	3 times	2
3	4 to 5 times	3
4	5 to 6 times	4

Others (specify)

……..

24.How often do you feed your infant per day?

1	3 times	1
2	4 times	2
3	5 times	3
4	6 times	4

Others (specify)

…….

25.What are the advantages of exclusive breastfeeding

1	The infant gets enough nutrients	5
2	Encourages growth and development	4
3	Increases mild flow	3
4	Predisposes the baby to HIV	1
5	I don't know	0

26.When did you initiate exclusive breastfeeding?

1	Within first hour of birth	5
2	After 2 hours of birth	4
3	After 3 hours of birth	3
4	After 5 hours of birth	2
5	After 6 hours of birth	1

27.What is exclusive breast feeding?

1	Giving baby breast milk only	4
2	Breastfeeding on demand	3
3	Giving the baby breast milk substitutes	2
4	Giving the baby water and sugar	1
5	I don't know	0

28.Why is the first breast milk best milk for the baby for the first days of life?

1	It contains enough nutrients and antibodies	4
2	Baby likes it	3
3	Is in abundance	2
4	Have no food value	1
5	I don't know	0

29.Which foods are contained in a balanced diet?

1	Starch and protein	0
2	Vitamins	0
3	Vitamins, starch, vegetables	0
4	Proteins, carbohydrates, vitamins, fats and minerals	5

30.Foods that are thick enough to stay in the spoon give more energy to the child?

1	Strongly disagree	1
2	Disagree somewhat	2
3	Neither agree nor disagree	3
4	Agree somewhat	4
5	Strongly agree	5

Appendix C

Re:

Ukama pakati peruzivo maererano neruzivo rwechikafu nemapirwo ezvikafu kuvana vane mwedzi minomwe kusvika pagore pachipatara nemakiriniki mudhorohba reMarondera.

Zita rangu ndinonzi Mercy Dorothy Tugwete, ndiri mudzidzi pakoridyi huru yemunyika (Unioversity of Zimbabwe). Ndiri kuita Masters Degree in Nursing Science. Ndiri kuita wongororo yeruzivo kuzadzikisa kudzidza kwangu pamusoro penhaurwa iri pamusoro.

Ndiri kukumbirawo mvumo kuti ndishande nemi pakundipindurirawo mibvunzo yangu. Ruzivo rwandichawana runobatsira kuvandudza mabatirwo enyu muzvipatara. Pamapepa aya hatiisi mazita kuitira kuchengetedza imi. Nhamba ndidzo dzichashandiswa. Munogona kutora maminetsi makumi maviri pakupindura mibvunzo. Makasungunuka kuramba kupindura mibvunzo nguva iri ipi zvayo. Zve kuramba kwenyu hakukanganise kubatsirwa kwenyu pachipatara. Muchagona kusangana nemimwe mibvunzo ingakushungurudzai kufanana nekuti munotambira marii. Pane zvamunoda kubvunza munogona kufona ku University of Zimbabwe College of Health Sciences, Department of Nursing Science pafoni dzinoti 04-791631 extension 2221. Ndaverenga ndikanzwisisa/ndaverengarwa ndikanzwisisa fomu iri.

Runyoro rwemupinduri.....

Runyoro rwemubvunzi.....

Date.....

Appendix D

Bvunzo Yakarongwa

Chikamu Chekutanga

Mibvunzo iri maererano nemunhu

Ndichakubvunzai maererano nemi

Ndinokumbira mupindire sekuziva kwenyu

1. Mune makore magani? ☐
2. Makaroorwa here?
   1 Handina kuroorwa ☐
   2 Ndakaroorwa ☐
   3 Takasiyana ☐
   4 Tinogarisana ☐
   5 Ndakafirwa ☐
   6 Takasiyana ☐
3. Mune vana vangani?
   1 Mumwe chete ☐
   2 Vaviri ☐
   3 Vatatu ☐
   4 Vana kana kudarika ☐
4. Makadzidza kusvika papi?
   1 Handina kudzidza ☐
   2 Primary ☐
   3 Secondary ☐
   4 Tertiary ☐
5. Mwana wenyu mwanayi?
   1 Musikana ☐
   2 Mukomaa ☐
6. Mwana wenyu akura sei? ☐

7. Munoita basa rei?

1	Mudzimai ari mumba make	
2	Kushanda mudzimba	
3	Kushanda muchimbomira	
4	Kushanda basa rese rese	
5	Munozviitira mabasa emawoko	
6	Makadzidzira basa	

8. Munotambira marii pamwedzi?

1	Mari iri pasi pe US$100	
2	Mari iri pakati pe US$100 – US$150	
3	Mari ir pakati per US$150 – US$200	
4	Mari iri pakati pe US$200 – US$300	
5	Mari iri pakati pe US$300 – US$500	
6	Mari iri pamusoro pe US$500	

9. Munogara muri vangani vanodya mupoto imwe?

1	Vatatu	
2	Vana	
3	Vashanu	
4	Kudarika vashanu	

10. Mwana makamusunguka nenzira ipi?

1	Akauya nemusoro	
2	Ndakaitwa oparesheni	
3	Ndakaita wekuzuviwa	
4	Akauya nemakumbo	

11. Muri wechitendero chipi?

1	Mukirisitu	
2	Zvechivanhu	
3	Vamwenyi	
4	Vapostori	
5	Vamwewo	

12. Makasungunutsa nani?

1	Mukoti/nyamukuta	
2	Chiremba	
3	Mbuya nyamukuta	
4	Ndega	

Chikamu chechipiri
Mapiro Echikafu kuvana

13. Makarumura mwana akura zvakadii?

1	Mushure memwedzi mitatu	1
2	Mushure memwedzi mishanu	3
3	Mushure memwedzi mitanhatu	4
4	Pamwedzi mitanhatu	5
5	Pamwedzi minomwe	2

14. Muri kupa mwana kudya kupi?

1	Mikaka yemugaba	4
2	Mukaka wemombe	3
3	Mukaka wembudzi	2
4	Kuyama kunevamwe mai	5
5	Kuyamwisa nekumwewo kudya	1
6	Mukaka wemuzamu wakadziyiswa	6

15. Munombobatsirawo here maererano nekuyamwisa navana mukoti?

1	Hongu	4
2	Kwete	2
3	Dzimwe nguva	3
4	Kana zvako hatibatsirwi	1

16. Muri kure zvakadii nekiriniki?

1	3 km	4
2	4 km	3
3	5 km	2
4	Above 5 km	1

Chipimo = 1 kusvika 5, 1 = Handibvu irane nazvo, 2 = handinyatsobvumirana nazvo, 3 = handibvumirane kana kuwirirana nazvo, 4 = ndinobvuma hanguwo, 5 = ndinobvumirana nazvo.
Chipimo chirikutaura nemibvunzo 17 kusvika 21.

17. Kupa mwana mafuta pamwedzi mitanhatu yelutanga kunobatsira

1	Handibvumirane nazvo	4
2	Handinyatsobumirara nazvo	3
3	Handibvumirane kana kuwirirana nazvo	2
4	Ndinobvuma hanguwo	1
5	Ndinobvumirana nazvo	0

18. Kumhuri kwangu kuyamwisa chete kunotenderwa

1	Handibvumirane nazvo	0
2	Handinyatsobumirara nazvo	1
3	Handibvumirane kana kuwirirana nazvo	2
4	Ndinobvuma hanguwo	3
5	Ndinobvumirana nazvo	4

19. Kudya kwakakorera kunogara muchipunu kunononoka kugaiwa mudumbu

1	Handibvumirane nazvo	4
2	Handinyatsobumirara nazvo	3
3	Handibvumirane kana kuwirirana nazvo	2
4	Ndinobvuma hanguwo	1
5	Ndinobvumirana nazvo	0

20. Mukaka wemuzamu unogona kudziiswa nekupa kumwana

1	Handibvumirane nazvo	0
2	Handinyatsobumirara nazvo	1
3	Handibvumirane kana kuwirirana nazvo	2
4	Ndinobvuma hanguwo	3
5	Ndinobvumirana nazvo	4

21. Munogeza mawoko kana zvaita sei?

1	Pese paasvibira	4
2	Ndisati ndabata chikafu	3
3	Pandinonzwira kuti ndiageze	2
4	Zvimwewo	1

Chikamu chechitatu
Mibvunzo iri maererano neruzivo nechikafu.

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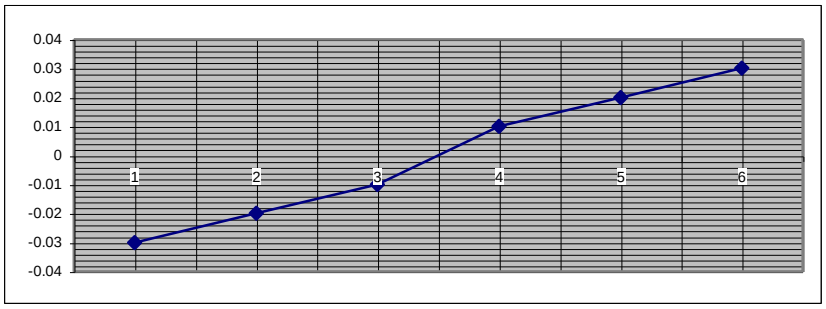
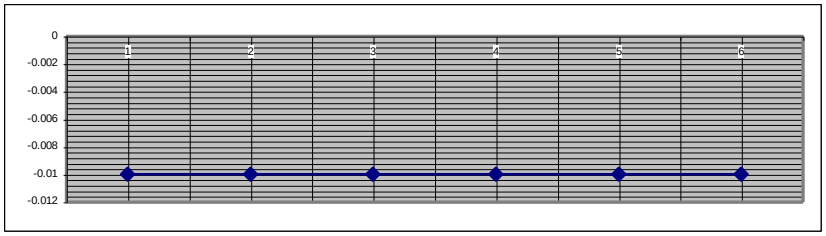
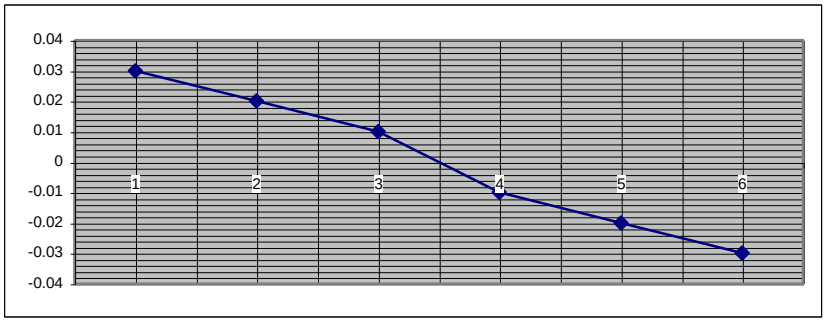
22. Wongororo yeuremu hwemwana pamamiriro egirafu pakadhi remwana. Tarisai moona kuti nderipi girafu riri pakadhi remwana wenyu.



Good 2



Dangerous 1



Very Dangerous 0

23. Mwana wenyu anoita weti kangani?

1	Kamwechete pazuva	1
2	Katatu pazuva	2
3	Kana kusvika kashanu pazuva	3
4	Kashanu kusvika katanhatu pazuva	4
5	Kanopfuura zvataurwa	

24. Munopa mwana chikafu kangani pazuva?

1	Katatu pazuva	1
2	Kana pazuva	2
3	Kashanu pazuva	3
4	Katanhatu pazuva	4
5	Kanopfuura zvataurwa	

25. Kuyamwisa kwega kusina chimwe chinopiwa kwakanakira chii?

1	Kunoita mikana yekuti mwana abate utachiwana iwande	1
2	Kunobatsira kukura kwemwana	4
3	Kunoita kuti mukaka ubude zvishoma	3
4	Handizivi	0
5	Mwana anowana kudya kwakakwana	5

26. Makatanga mushure menguva yakadini kuyamwisa musingape mvura kana chimwe chinhu kumwana?

1	Muawa rimwe mushure mekupona	5
2	Mushure mema awa mairi	4
3	Mushure meme awa matatu	3
4	Mushure mema awa mashanu	2
5	Mushure mema awa matanhatu	1

27. Kuyamwisa usina chimwe chaunopa

1	Kupa mukaka wemuzamu chete	4
2	Kupa mwana mvura neshuga	1
3	Kupa mwana mimwe mikaka iri yemuzamu	2
4	Kuyamwisa mwana paanodira	3
5	Handizivi	0

28. Mukaka wekutanga wemuzamu wakanakira chii kumwana mucheche?

1	Une zvekudya zvakakwana nemasoja anodzivirira miiri	4
2	Hauna chikafu	1
3	Mwana anouda	3
4	Wakawandisa	2
5	Handizivi	0

29. Ndekupi kudya kuri mukudya kwakaenderana?

1	Starch and protein	0
2	Vitamins	0
3	Vitamin, starch and vegetables	0
4	Vitamins, proteins, carbohydrates, fats and minerals	5

30. Kudya kwakakorera zvekugara muchipunu kune samba kumwana

1	Handiwirirane nazvo	1
2	Ndizvowo hazvo	2
3	Handiwirirane nazvo/ndinowirirana nazvo	3
4	Ndinowirirana nazvo	4
5	Ndinowirirana nazvo zvakasimba	5