KNOWLEDGE, ATTITUDE AND PRACTICES OF INFANT FEEDING OPTIONS IN THE CONTEXT OF PMTCT OF HIV: A CASE STUDY OF KINONDONI - DAR ES SALAAM

BY

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ABSTRACT

The study was designed to assess the knowledge, attitude and practices of HIV-positive mothers on infant feeding options in the context of PMTCT of HIV. The focus of the study was in clinics situated in Kinondoni Municipality in Dar es Salaam City. Interviews using questionnaires were used to collect data from sampled respondents. The interviews were held at the PMTCT clinics and followed by observations at homes. Data collected were analyzed by using Statistical Package for Social Science (SPSS) computer programme version 12.0. The study noted that HIV-positive mothers practiced two common options of feeding their infants after delivery. These were exclusive breastfeeding for less than six months and no breast feeding (i.e. exclusive use of replacement milk). However, low rates of adherence to instructions during preparation were also noted. More than 90% had poor adherence and only 7.8% followed correctly all the required procedures. About 86% showed poor hygienic practices. Furthermore, the study revealed that the PMTCT programme was neither performing enough demonstrations to mothers on the appropriate feeding methods nor making sufficient follow ups. Health workers (97.8 %) were reported to be the major source of the information. Services from other institutions other than PMTCT clinics, such as provision of replacement milk, were not provided to most of the respondents (87.7%). Constraints like stigma, poor affordability of replacement milk were noted to have some effect on the initial decision for the infant feeding option. The study recommends sensitization of key community members to support the HIV-positive mothers. There is a need for placement of a nutritionist in every PMTCT clinic to work on dietary and feeding issues together with conducting regular training to counselors on infant feeding methods.

DECLARATION

I, Stella Chambo Nzelu, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work and has not been submitted for a higher degree award in any other University.

Signature ..... 17/11/2008.....

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This work is dedicated to my parents; Mr. Ernest S. Chambo and mother Immaculata Chalamila who laid the foundation of my education. The work is also dedicated to my husband Charles; sons Herman and Rabson.

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LIST OF ABBREVIATIONS AND SYMBOLS

AIDS	:	Acquired Immunity Deficiency Syndrome
ART	:	Anti-Retrovirus Therapy
ARV	:	Anti-Retroviral
BF	:	Breast Feeding
CIF	:	Commercial Infant Formula
CTC	:	Care and Treatment Centre
EBF	:	Exclusive Breast Feeding
FAO	:	Food and Agriculture Organization
GDP	:	Gross Domestic Product
GIT	:	Gastro Intestinal Tract
HBC	:	Home Based Care
HIV	:	Human Immunodeficiency Virus
IBFAN	:	International Baby Food Action Network
IFO	:	Infant Feeding Options
ILO	:	International Labour Organization
KMC	:	Kinondoni Municipal Council
MCH	:	Maternal and Child Health
MoHSW	:	Ministry of Health and Social Welfare
MTCT	:	Mother-to-Child Transmission
NACP	:	Nation AIDS Control Programme
PMTCT	:	Prevention of Mother-to-Child Transmission
SPSS	:	Statistical Package for Social Sciences
SUA	:	Sokoine University of Agriculture
TACAIDS	:	Tanzania Commission for AIDS

TBS	:	Tanzania Bureau of Standards
TDHS	:	Tanzania Demographic and Health Survey
TFNC	:	Tanzania Food and Nutrition Centre
TRCHS	:	Tanzania Reproductive and Child Health Survey
UN	:	United Nations
UNAIDS	:	United Nations Special Programme on AIDS
UNFPA	:	United Nations Population Fund
UNICEF	:	United Nations Children's Fund
URT	:	United Republic of Tanzania
USAID	:	United States Agency for International Development
USD	:	United States Dollar
WHO	:	World Health Organization

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Infant feeding in Tanzania and probably in Africa is mostly dominated by breastfeeding. Under normal circumstances, breast milk is the best food for the babies and there is no any other food that is as good as breast milk. It is preferred as the first choice for most infants when available and appropriate. It is a natural food for full term infants during the first months of life (Sardesai, 1998).

The milk that is produced during the first days after delivery, normally up to 4 days, is called colostrum which is high in protein and low in fat for supplying the needs and reserves of the newborn at birth. It is energy-dense and rich in protective antibodies and the fat-soluble vitamins E and A (Vinther and Helsing, 1997). Breast milk also contains a number of chemical substances that have complex and effective anti-infectious properties which neutralize, destroy and eliminate viruses, bacteria and parasites known to cause some diseases (Sardesai, 1998). Breast milk can meet the nutrition requirement of the baby for up to 6 months, and continue to be the main source of nutrients for several more months. It provides up to 35% of the child nutrient requirements for up to 2 years of age.

The HIV epidemic has changed the context in which HIV-positive mothers make decisions about how to feed their infants. A woman infected with HIV can transmit the virus to her child. The transmission is about 5 – 10% during pregnancy, 10 – 15% during labor and delivery, 10 – 20% through breastfeeding when continued for 2 years (WHO/UNICEF/UNAIDS/UNFPA, 2004). The risks of transmission in the

absence of intervention through breast feeding to 6 months are 20 – 35% (URT. 2005a).

Ever since the human immunodeficiency virus (HIV) was first identified in the breast milk, HIV-positive mothers are now faced with a dilemma of competing risks. Firstly, the risk of mother-to-child transmission of HIV through breastfeeding, and secondly the risk of infant morbidity/mortality from other causes if breastfeeding is withheld (Morrison and Greiner, 2000). The latter possibility becomes particularly meaningful in two contexts: that is in resource-poor settings where infant morbidity/mortality rates are high, and among those babies who already are HIV-infected at birth and for whom breastfeeding is likely to prolong life.

Most women in Tanzania with their immunodeficiency virus (HIV) status diagnosed during pregnancy, because of testing available through Prevention of Mother to Child Transmission of HIV (PMTCT) program, also face difficulties on how to feed their infants after delivery. In high-income countries, formula feeding is substituted for breast feeding to reduce the risks of MTCT. In low-income countries, replacement feeding increases the risk of morbidity and mortality associated with malnutrition and infectious diseases other than HIV (Nishi *et al.*, 2003). Breastfeeding is normally the best way to feed an infant. It is a public health responsibility to prevent HIV infection in infants and young children, and to support optimal breastfeeding to prevent mortality and illness due to diarrhea and respiratory infections. Given the need to reduce the risks of HIV transmission to infants while, minimizing the risks of other causes of morbidity and mortality, the UN guidance emphasizes that avoidance of breast feeding by HIV-infected mothers should only be undertaken when replacement feeding is acceptable, feasible, affordable, sustainable

and safe (AFASS). Otherwise, exclusive breastfeeding is recommended during the first six months of life (WHO, 2005).

Although infant feeding counselling is provided in PMTCT clinics, adherence to a chosen infant feeding options is especially challenging for the targeted women. Thus, the infant feeding options for HIV-positive mothers have raised concern on the knowledge, attitude, and practices of these mothers on what they choose.

Infant feeding options that are commonly practised differ from community to community. In some communities, especially in urban areas, women who are HIV-positive may have many options to choose from. In other communities, appropriate options may be more limited. However, the option to be chosen should be based on individual situation. Each of the infant feeding options has advantages and disadvantages whereby some carry a higher risk of passing HIV to the baby while others are more likely to make babies sick from diarrhoea and other serious diseases (WHO, 2005). Examples of infant feeding options are exclusive breast feeding, exclusive replacement feeding using commercial infant formula, home modified animal milk, expressing and heat-treated breast milk, breast- milk banks and wet nursing.

Although breastfeeding will not prevent the possibility of mother-to-child transmission of HIV through breast milk, the implications of this for child survival in the absence of breastfeeding poses major challenges and deserve close scrutiny. Very little is known about the impact of not breastfeeding in communities where breastfeeding is the cultural norm. For instance, small attention has been paid to the social stigma of not breastfeeding in Africa, which would immediately identify a

woman as HIV-positive (Morrison and Greiner, 2000). A recent pooled analysis of data from developing countries found that infants who are not breastfed have a six-fold greater risk of dying from infectious diseases in the first 2 months of life than those who are breastfed (UNICEF, 2002). It will therefore be difficult, if not impossible, to provide safe breast milk substitutes to children from underprivileged populations (Morrison and Greiner, 2000).

1.2 Problem Statement

In 2005, around 700 000 children under the age of 15years worldwide became infected with HIV mainly through mother-to-child transmission (MTCT). About 90% of these MTCT infections occurred in Africa where AIDS is beginning to reverse decades of steady progress in child survival (URT, 2000).

The PMTCT Programme in Tanzania has managed to train trainers, health workers and counsellors on breast feeding from national to lower levels. However the training and services are provided by different partners with different background, in which the knowledge and skills are likely to differ. These services are mostly provided in PMTCT clinics whereby mothers are counselled to choose infant feeding option and trained on how to follow the guidelines. The choice not to breast feed their infants carries a risk for infants' survival and replacement feeding is sometimes constrained by poor knowledge, attitude and practice, and poor follow ups and support. Some women fail to adhere because of the need to hide their HIV status, social-cultural pressure and scarce resources for sustaining formula feeding (Doherty *et al.*, 2006a).

1.3 Problem Justification

Infant and child feeding knowledge, attitude and practices are important determinants of the health and nutrition status of the children below the age of five years. Poor infant feeding knowledge and practices especially in exclusive breastfeeding during the first six months of life and inadequate complementation are important risk factors for infants and childhood morbidity and mortality (UNICEF, 2002).

According to this, effective nutritional counselling on the risks and benefits of different infant feeding options and regular follow ups including home visits to assist those women on infant feeding options is needed. This is to ensure the risk of MTCT through breastfeeding is reduced and improving better nutrition of the infants.

The findings of this study are expected to help in formulating efficient policy and strategies that may be used by the health workers, policy makers, nutritionists and community in general to support the HIV-positive mothers to reduce risks of MTCT. This will be done by supporting the mothers to properly choose and undertake appropriate methods which they can manage.

1.4 Objectives

1.4.1 General objective

The main objective of the study is to bring about good understanding of the knowledge, attitude and practices of infant feeding options in the context of PMTCT of HIV, so as to implement effectively PMTCT strategies through infant feeding options.

1.4.2 Specific objectives

Specific objectives of this study are:-

1. To assess the awareness and knowledge of HIV-positive mothers about mother-to child transmission of HIV (MTCT).
2. To determine the attitude and practices of infant feeding by HIV-positive mothers and assess their adherence to available guidelines on PMTCT of HIV.
3. To identify constraints that influence the choice of infant feeding methods.
4. To identify and assess the relevance of support provided to HIV-positive mothers in the context of PMTCT.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Global Epidemiology of HIV/AIDS

HIV and AIDS is a major health problem globally. It was estimated that about 38.6 million people were living with HIV and AIDS worldwide in 2005 (UNAIDS, 2006a). Sub Saharan Africa is the world's most severely affected region, with only 10% of the world population it harbors about two thirds of the global total number of people living with HIV and AIDS (Pembley, 2007). At the end of 2007, the Joint United Nations Programme on HIV/AIDS (UNAIDS) estimated that out of the 30.8 million adults worldwide are living with HIV, around half were women. It is indicated that 98% of these women live in developing countries (UNAIDS, 2006a).

In 2004, the joint United Nations Programme on HIV/AIDS (UNAIDS) estimated that 25.8 million African adults and children were living with HIV/AIDS. About 2.4 million Africans died of HIV/AIDS in the same year (WHO, 2005). The continent is the only region in the world where more women than men are infected with HIV. Most of these women are at the ages between 15 and 24 and are infected more often and earlier life than men of similar age (UNAIDS 2006a).

TACAIDS and TBS (2004) conducted a survey including blood testing for HIV in Tanzania Mainland where results showed that adults aged 15 – 49 years had a prevalence of about 7% (i.e. 6.3% for males and 7.7% for females). By the end of 2004, more than two million people were estimated to be living with HIV and AIDS in Tanzania mainland. Awareness of the modes of HIV transmission has been found to be high. Over 90% of Tanzanians aged 15 – 49 have heard of HIV/AIDS, and with

almost 90% of adults knowing that having only one uninfected, faithful partner can reduce the chances of getting HIV (URT, 2005a).

2.2 Impact of HIV/AIDS in Tanzania

Since 1983 when the first cases of AIDS were reported in Tanzania, the HIV epidemic has spread rapidly to all districts and communities affecting all sectors of the society. A total of 18 929 AIDS cases were reported by the National Aids Control Program (NACP) from the 21 regions during the year 2003 (NACP, 2003). This resulted into a cumulative total of 176 102 reported cases since 1983 when the first 3 cases were identified in the country whereby about 71% of the affected were in the age group of 25 – 49 years and 15% in the age of 15 – 24 years (Lyamuya *et al.*, 2002). The impact of HIV epidemic has been profound and has affected all sectors. Today, HIV and AIDS is recognized not only as a major public health concern, but also as a socio-economic and developmental problem in Tanzania as in most Sub Sahara African countries.

2.2.1 Health impact

HIV and AIDS has interacted with other underlying public health problems, most notably tuberculosis, which remains one of the principal causes of death in persons with HIV infection worldwide (WHO, 2004b). The HIV pandemic has also reduced resources available for other health problems. Health care personnel are affected as well by the pandemic resulting in human resource crises in hospitals at a time that more resources are needed to start care and treatment programs with Anti-Retrovirus Therapy (UNAIDS, 2006b). It has been reported that in most District and Regional Hospitals in Tanzania a bed occupancy rate of up to 60% is taken by HIV related conditions (URT, 2005a).

2.2.2 Economic impact

HIV and AIDS affect economic growth which makes it difficult for nations and individuals to mount adequate and comprehensive responses to the epidemic. According to Pembley (2007), poor health and deaths due to AIDS reduce agricultural labour force, productivity and disposable incomes in many families and rural communities of most African countries. In addition, reports show that poverty is a powerful co-factor to the spread of HIV and AIDS (URT, 2005a). However, economic development is impeded by several harsh realities of high rates of infectious diseases such as HIV/AIDS. Data from Kagera, one of the regions most affected by HIV and AIDS in Tanzania, indicate that the annual Gross Domestic Product (GDP) declined from USD 268 to USD 91 between 1983 and 1994 respectively due to mostly HIV/AIDS infection (NACP, 2003). Sixty percent of Tanzanian women are estimated to live in poverty and AIDS was believed to be a major cause which is associated with reduced agricultural production and all income generating activities (URT, 2005a).

A study in South Africa found that already poor households coping with members who are sick from HIV or AIDS were reducing spending on necessities even further. The most likely expenses to be cut were clothing (21%), electricity (16%) and other services (9%). Falling incomes forced about 6% of households to reduce the amount they spent on food and almost half of households reported having insufficient food at times (UNAIDS 2006a).

2.2.3 Social impact

AIDS is widespread in both urban and rural communities and mostly affects persons at peak of being active sexually and in economic activities. Death of a young adult often means loss of a father or/and mother and family's income generator. Studies conducted in Arusha, Kagera and Mwanza regions show a serious and growing breakdown of social network, which have hitherto sustained African societies (NACP, 2003). Orphans are not only subjected to material, social and emotional deprivation, but also lack of opportunities for education and health care. Widows and orphans are deprived of their inheritance rights by relatives through the applications of unfair traditional practices and customary laws such as inheritance of land, family property, and rights for the children to attend school (URT, 2005a).

2.3 Mother-to-Child-Transmission of HIV (MTCT)

Mother-to-child transmission (MTCT) occurs when an HIV-positive woman passes the virus to her baby. This can occur during pregnancy, labour and delivery, or breastfeeding. The risk of MTCT is estimated at 15 – 40% in developing world (WHO, 2004a). Without preventive interventions, approximately one-third of infants born to HIV-positive mothers contract HIV through mother-to-child transmission. About 800 000 children under the age of 15 years contracted HIV, over 90% of them through MTCT in 2001 (URT, 2005a). Between 15 and 25% of children born to HIV-infected mothers get infected with HIV during pregnancy or delivery, while about 15% of the children get infected through breastfeeding world wide (UNICEF, 2002).

Mother-to-child transmission remains the leading cause of HIV infection in children. The available data in Tanzania shows that the risk of MTCT to be about 40%.

generally distributed as follows: 10% in utero, 20% during labour and delivery and 10% through breast feeding (URT, 2005a). In 2002, mother to child transmission accounted for 6% of the reported AIDS cases. Further estimations show that the prevalence of HIV/AIDS among pregnant women attending antenatal sites is 9.6% (NACP, 2003). UNAIDS (2004) estimated that the percentage of HIV-infected infants born to HIV-infected mothers in Tanzania is to be 25%. It is also estimated that MTCT is the cause of about 72 000 infected children annually.

2.4 Prevention of Mother to Child Transmission of HIV Program (PMTCT)

Since the mid 1980s when HIV was detected in breast milk and cases of HIV transmission in infants during breast feeding were documented, health policymakers and program managers struggled to develop appropriate and feasible guidelines on infant feeding for mothers living in areas where HIV was present (Preble and Piwoz, 1998a). The studies generated a general consensus on the facts that HIV can be found in breast milk of HIV-positive mothers and can be transsimitted to infants by breast feeding. Various initiatives in response to HIV and AIDS on child survival have been developed in the world. A number of prevention strategies for mother to child transmission of HIV in high income countries include using antiretroviral drugs, elective caesarean section and avoiding breast feeding (Dabis *et al.*, 2000).

By 2001, UNICEF and other UN agencies were supporting 80 programmes to prevent mother-to-child transmission of HIV in 16 countries. Between April 1999 and July 2001, these programmes reached over 300 000 new clients in antenatal care centres, providing counseling to 220 000 women and HIV testing to 138 000 women (UNICEF, 2002).

In Tanzania Mainland, PMTCT programs provide a package of services to prevent transmission of virus from mother to child. PMTCT services are fully integrated in the MCH, labour and delivery services to support an essential package of prenatal care, which includes at a minimum the following:-1) focused visits, 2) birth preparedness, 3) disease detection, 4) prevention and treatment of diseases, and 5) counselling on nutrition, including infant feeding and providing supplementation of micronutrients (Glaser, 2006). Currently 467 out of 2 509 health facilities in Tanzania provide PMTCT services, which is about 12% of the total facilities from eleven designated regions (TACAIDS, 2008). The protocol for the national PMTCT programme includes voluntary HIV counselling and testing during antenatal care, short-course on preventive ARV regimens to prevent mother-to-child transmission; single-dose nevirapine for mother during labour and infants within 72 hours after delivery as well as counselling and support for safe infant feeding practices (URT, 2004). This has to be achieved by provision of comprehensive antenatal care to an HIV-positive woman during pregnancy including ongoing counselling on infant feeding and support as an integral part of management.

2.4.1 Postnatal care of women with HIV and AIDS

After delivery an HIV-positive woman should receive continued care at the PMTCT clinic such as postnatal examination directed towards eliciting signs or symptoms of physical illness and emotional stress, taking care of the baby, informing other care givers of her HIV status, encouraging the woman to talk about her feeding options and discussing the additional risks of breastfeeding (Bentley *et al.*, 2005). Provision of postnatal care of the woman is important for long term baby's health and her own. A provision of appropriate infant feeding methods is also employed to reduce the

HIV transmission from mother to child and moreover to ensure good nutritional status of the child. Follow up of mothers and infants after delivery remains a big challenge. A study done in northern part of Tanzania reported unsatisfactory support to follow up women after they had given birth (Leshabari *et al.*, 2007). One counsellor gave the following remarks: "Our counselling work is not complete because we don't know what happens to our clients when they go home after being counselled at the clinic".

Although it is believed that most women and infants do have regular contacts with a health institution, still they are not visited at home. The system is not able to follow up the mother-infant pairs because they are not recognizable in the system. HIV-positive mothers might go for vaccinations to a different clinic which is closer and since the infant card does not carry information from the mother, the child is not recognized as being exposed to HIV (Glaser, 2006).

2.4.2 Nutritional counselling on infant feeding

Appropriate and healthy feeding of the baby during the first year of life is extremely important. More growth occurs during the first year than at any other time in the child's life. For the first few months, breast milk or formula is all that is needed. As the baby grows, starting a variety of healthy foods at a proper time is important for proper growth and development (Packard, 2007).

Infant feeding counselling and support are key interventions for the prevention of mother to child transmission of HIV (PMTCT). All HIV-positive women need counselling that includes information about the risk and benefits of various infant

feeding options. guidance in selecting the most suitable option for their situation and support to adopt the choice made (WHO, 2005).

To enable mothers to carry out their decisions safely and effectively, UNICEF works to expand access to voluntary counselling and testing and to train health workers. counsellors and support groups on HIV and infant feeding (WHO/UNICEF/UNAIDS, 2005). Counselling tools have been created to help health workers counsel HIV-positive mothers on infant feeding issues. The tools are based on UN policies and guidelines, in which are intended to be used by health workers who have already been trained in both HIV and infant feeding counselling and are working in the context of PMTCT programmes (WHO/UNICEF/UNAIDS, 2005).

In addition to ongoing support for the International Code of Marketing of Breast-milk Substitutes and Baby-friendly Hospital Initiative, UNICEF helps governments devise infant feeding guidelines through studies that evaluate the acceptability. feasibility, affordability, sustainability and safety of various options for HIV-infected mothers.

2. 5 Experience on the Knowledge, Attitude and Practices on Infant Feeding Options in the Context of PMTCT

Various factors have been noted to contribute in decision of the mother about infant feeding options. Knowledge and attitudes towards several options have an influence on practising of the chosen method. A study done in South Africa in three PMTCT sites showed that 57.5% of HIV-positive mothers practiced breastfeeding due to entrenched knowledge that "breast milk is the best" and also a fear of disclosure of their HIV status to the relatives (Doherty *et al.*, 2006a). These factors were noted to

outweigh the perceived risks of transmission through breast milk although they were given free formula milk if they would decide not to breastfeed. Another study in India examined feeding intention and practices of counselled 101 HIV-positive pregnant women (Nishi *et al.*, 2003). The questions were related to their feeding decision, disclosure of their HIV serostatus and household environment. The results showed that 60% of those who chose to breast-feed initiated breastfeeding because it was suggested by the counsellor and because they could not afford replacement milk (Nishi *et al.*, 2003). However, 93% in the sample decided to change their infant feeding plan from their original intention due to various factors like family pressure, failure to afford replacement milk and suggestions from counsellors or doctors.

A prospective cohort study conducted by the Kenya Medical Research Institute and the University of Nairobi, looked at 296 HIV-positive mothers (IBFAN AFRICA, 2007). It was found out that 33% of the women chose to formula-feed and 67% chose to breastfeed their babies because breastfeeding is "nutritionally optimal for all infants" and "not found to be associated with increased maternal morbidity or mortality among HIV-positive mothers when appropriate care is available". Also, replacement feeding is in fact more likely to create substantial additional risks and does not reduce overall infant mortality (IBFAN AFRICA, 2007).

A cross sectional survey done in Tanzania in three regions of Kagera, Mbeya and Kilimanjaro found out that there was a limitation in terms of knowledge and skills in breastfeeding and infant feeding options (TFNC, 2004). It was therefore noted that hospital counsellors have an important role in assisting women in their intended feeding choices as well as actual practices.

A study done in Kilimanjaro at four PMTCT sites in Moshi Town (Leshabari *et al.*, 2007) found out that counsellors complained about lack of confidence and skills in HIV and infant feeding counselling as one counsellor said: "I have been working for more than twenty years as a public health nurse, routinely educating mothers on prevailing health problems. I have only attended one seminar for one week on promoting exclusive breastfeeding. I'm still using the same knowledge to educate mothers on how to feed their babies. I feel like I'm not knowledgeable enough to give my clients updates, especially in this time of AIDS". In light of the above findings, the conditions under which nurse-counsellors are expected to provide good quality counselling services on infant feeding are critically questioned.

2.6 Infant Feeding Methods to Prevent HIV Transmission from Mother to Child

A woman should learn how to implement her chosen feeding methods before her baby is born during the last trimester of pregnancy, or as soon as possible after she has given birth. Mothers will decide how to feed their infants but, to make an informed choice, they need counselling to know the benefits, risks and costs associated with all infant feeding options (URT, 2005b). There are varieties of possible feeding options available and common in our country. They include the following: -

- Breast-feeding methods
- Breast-feeding replacement methods

2.6.1 Breast-feeding methods

Exclusive breastfeeding is widely accepted and adopted as the most appropriate way of feeding an infant from birth to six months (TFNC, 2004). In Tanzania, majority of

mothers' breastfeed for a relatively long period over 20 months but the extent of exclusive breast feeding is low (Paoli *et al.*, 2001). The rate of exclusive breast feeding increased from 23% in 1992 to 32% in 1999 (Nyagawa and Husscin. 2004).

Breastfeeding eliminates the expense on infant formula or other substitutes and the incalculable emotional and economic costs of illness and death resulting from problems associated with artificial feeding. In many countries. feeding a child on breast milk substitutes can cost more than the average income of a family. Breastfeeding can also help with birth spacing by delaying the resumption of fertility after childbirth (UNICEF, 2002). In the context of PMTCT. two aspects of breast feeding (BF) can be recognized. namely exclusive breast feeding and heat treated milk.

2.6.1.1 Exclusive breast-feeding

It is estimated that even in the era of HIV and AIDS breastfeeding remains the best possible nutrition for the great majority of babies (WHO. 2005). Exclusive breastfeeding is the method in which mother gives her baby only breast milk and prescribed medicine but no water, other liquids or food to the infant for the first six months of life, normally 6 months (WHO, 2005). WHO with the scientific community strongly recommend initiating breastfeeding within half an hour of birth. Evidence shows that early initiation can prevent 22% of all deaths among babies below one month in developing countries. Every newborn, when placed on the mother's abdomen, has ability to find its mother's breast all on its own and to decide when to take the first breastfeed (WHO/UNICEF/ UNAIDS/UNFPA, 2004).

For HIV-positive women who choose to breastfeed, exclusive breastfeeding is recommended for the first six months of an infant's life, and should be discontinued once an alternative form of feeding becomes feasible. Some researchers speculate that the risks of HIV transmission may be lower when exclusive breastfeeding is practised. A study done in Durban, South Africa showed that exclusive breastfeeding during the first 3 months of life resulted in a lower risk of MTCT than mixed feeding (Doherty *et al.*, 2006b). The longer a child is breastfed by an HIV-positive mother the higher the risk of HIV infection. Coutsoudis *et al.* (1999) also found that the pattern of exclusive breastfeeding for three months carried a significantly lower risk of HIV-1 transmission than mixed feeding. However, a recent WHO consensus statement on HIV and infant feeding highlights critical issues in the continuing debate on whether the HIV transmission resulting from breastfeeding can ever be superseded by the benefits of breastfeeding and therefore justified ethically. Some of the new findings that are referred to in the document include: (1) exclusive breastfeeding for up to 6 months was associated with a three- to fourfold decreased risk of HIV transmission compared to non-exclusive breastfeeding, (2) where free infant formula was provided, the combined risk of HIV transmission and death was similar whether infants were formula fed or breastfed from birth; and (3) early breastfeeding cessation was associated with reduced HIV transmission but also with increased risk of morbidity and child mortality in infants born to HIV-infected mothers. Thus concluded that exclusive breastfeeding for the first 6 months for the majority of HIV-infected mothers who are poor should be improved for all children to meet the Millennium Development Goals of reducing child mortality (WHO, 2008).

According to Noble (2007), mixed feeding is not recommended because introduced foods may damage the lining of the baby's stomach and intestines and thus makes it easier for HIV from the breast milk to infect the baby. It may also introduce harmful germs, and may reduce gut acidity, making it easier for infections to take hold. However, some constraints in breast feeding face some mothers which include insufficient milk, failure to put the baby on the breast immediately after delivery, failure to breast feed on demand, concern about an unsatisfied infant and return to work (Shirima, 2001).

2.6.1.2 Expressing and heat-treatment of breast milk

This is a method whereby breast milk is modified by expressing or removing the milk from the breasts manually or with a pump, then heating it to kill HIV and storing it properly so that the breast milk is not contaminated. The breast milk is heated indirectly using the Holder pasteurization method, where the breast milk is heated to 62.5 degrees Celsius for 30 minutes, which helps to preserve some of the protective properties of breast milk and most of its nutrients although it may damage protective cells and may alter enzymes and affect some vitamins (WHO, 2005). Milk expressed and treated is only for the single feed that means the mother should not retreat for another use. However, high motivation is needed to feed infants in this way over the long term due to its time consuming.

2.6.2 Replacement feeding methods

In developing countries, Tanzania inclusive, replacement feeding (usually with cup feeding), often leads to an increased incidence of diarrhoea, malnutrition and death when strict hygienic precautions are not adhered to (Mosha and Svanberg, 1998).

Even with optimal hygiene, artificially fed infants suffer three to four times diarrhoea infection than the breastfed infants (UNICEF, 2001a). They also have higher rates of respiratory tract, ear, and other infections. Where infectious diseases and malnutrition are the primary causes of death during infancy, artificial feeding substantially increases the risk of dying because a baby fed on infant formula does not receive the special vitamins, nutrients and protective agents found in breast milk (Morrison and Greiner, 2000). A recent study of post neonatal mortality in the United States of America found a 25% increase in mortality when infants were not breastfed (UNICEF, 2002).

Two types of replacements feeding can be recognized, namely commercial infant formula and home-modified animal milk.

2.6.2.1 Commercial infant formula

This is a breast milk substitute formulated industrially in accordance with applicable Codex Alimentarius standards to satisfy the nutritional requirements of infants during the first months of life up to the introduction of complementary foods. This milk is sold in shops/stores or provided to HIV-positive mothers to feed their infants in order to prevent them from transmission of HIV (WHO, 2005). The cost of infant formula often puts it beyond the reach of poor families in resource poor countries, even if the product is widely available. Kanabus and Noble (2005) observed that many women also lack access to the knowledge, potable water and fuel needed to prepare replacement feeds safely, or simply have no ability to prepare them. Formula feeding is expensive and carries risks of additional illness and death if used incorrectly such as mixed with unsafe water, over-diluted, poor preparation and storage. Study done in South Africa (Coovadia *et al.*, 2007) indicates that if

breastfeeding is exclusive there is a significant difference in cumulative mortality at three months (6% in exclusive breastfeeding vs 15% in replacement feeding). Investigations done in Botswana indicate that when the mother is HIV-infected replacement feeding from birth does not improve HIV-survival compared to breastfeeding, even in such better-off African countries (UNICEF, 2002).

2.6.2.2 Home-modified animal milk

It is fresh or processed animal milk that is modified by adding water, sugar and micronutrient supplements. The milk must be modified to make it fit for babies less than 6 months of age. It has to be added with water, and then boil it, so that the baby can easily digest its nutrients (WHO, 2005). Sugar also should be added. Home-modified animal milk can be made from fresh milk of cow, goat, sheep, buffalo, and full cream milk (pasteurized or powdered). This modified animal milk is only suitable when commercial formula is not available and an infant requires about 15 liters of such milk per month for the first six months (WHO/UNICEF/ UNAIDS/UNFPA, 2004).

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Area

The study was conducted in Kinondoni Municipal Council (KMC) in Dar-es-Salaam region. The area was selected because of the presence of PMCTC clinics in urban and peri-urban areas which are governmental and non-governmental health facilities (hospitals, health centers and dispensaries). According to the 2002 Population Household Census, the Municipality had a total population of 1 088 567 people. Administratively, KMC is divided into 3 divisions, 27 wards, 14 rural villages and 113 urban streets.

The Municipality shares borders with Ilala and Temeke Municipalities in the south, Indian Ocean in the Northeast, Kisarawe District in the Southwest and Bagamoyo District in the north (Figure 1). The main economic activities include trade, formal employment, petty trading and agricultural production. KMC has a hot and humid climatic condition and there are two distinct seasons in a year. The rainy season is between October and December (short rains) while the main rainy season is from March to May (heavy rains). Average rainfall ranges from 1000mm to 1100mm per annum. The mean daily temperature is about 26 degrees Celsius, the mean seasonal range is about 4 degrees Celsius degrees Celsius and the mean daily range is 8 degrees Celsius. The relative humidity reaches 100% on most of the night of the year and rarely drops below 55% during the day. The Municipality has 24 PMTCT clinics in urban and peri-urban both in governmental and non-governmental hospitals, health centres and dispensaries. The Municipal Health Department follows the written infant feeding policy that is routinely communicated to all health care

staff trained to work in ARV and PMTCT clinics. Among them there are doctors, nurse-midwives, nutritionists and home based care attendants.

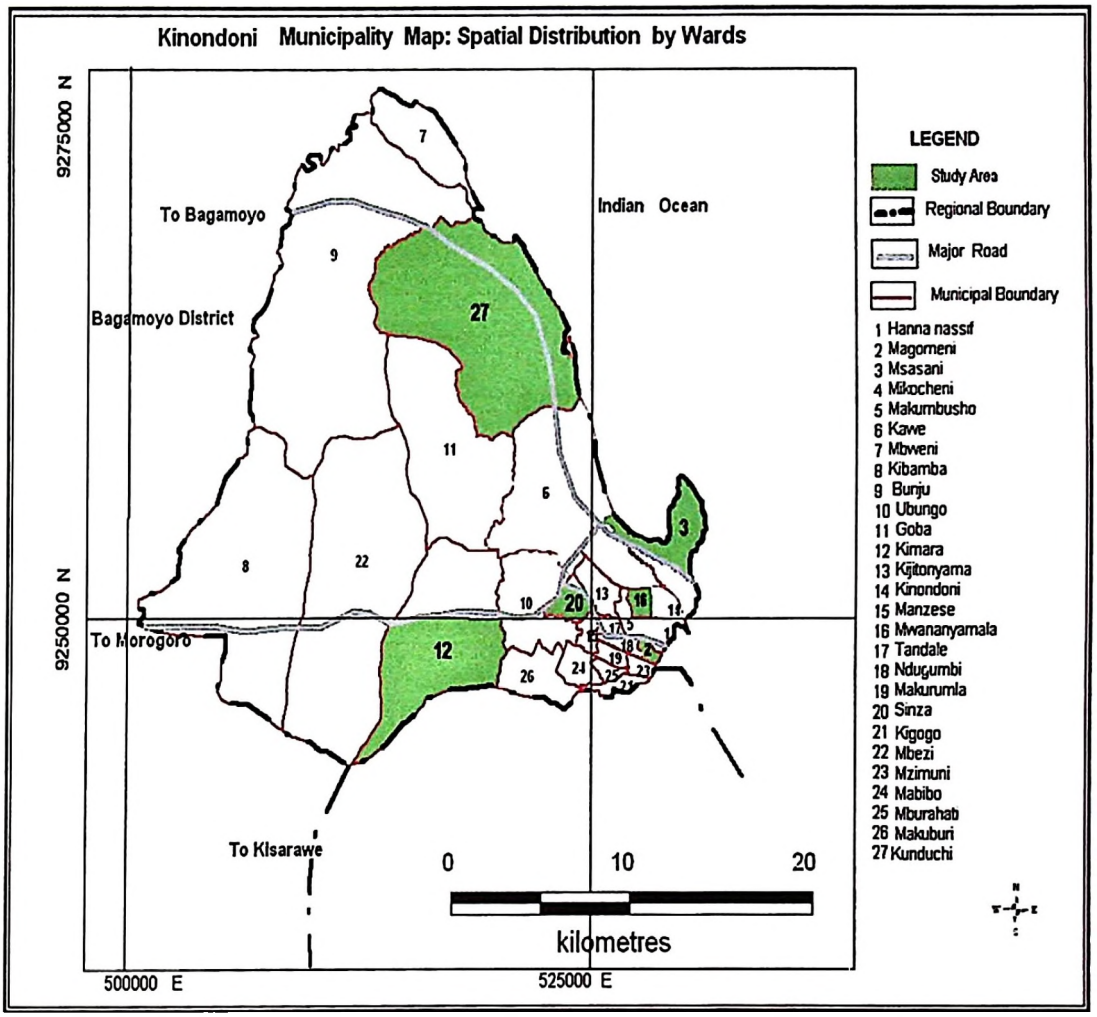

Figure 1: Kinondoni Municipality map

Source: KMC, 2006 – Land survey department

3.2 Research Design

A combination of semi-longitudinal and cross sectional design was employed in the study whereby data were collected in two phases. The design was chosen in order to facilitate data collection from the same respondents. A longitudinal study is a

research study that involves repeated observations of the same items over a long period of time. According to Pahwa and Blair (2002), a semi-longitudinal study is a study in which the response for each experimental unit in the study is observed on two or more occasions. Semi-Longitudinal design was used in this study to allow the repetition of the observations on the same respondents in two occasions to see the differences between the reported and observed information. On the other hand, according to Bailey (1994) and Casley and Kumar (1988), a cross sectional design is a design which allows data to be collected once at a single point.

3.2.1 The population and sampling unit

The target population consisted of all HIV-positive mothers having infants aged between 1 – 6 months in different PMTCT clinics in the study area. A sampling unit was a tested HIV-positive mother having a child aged between 1 – 6 months willing to be interviewed and visited at home. An HIV-positive mother was taken as the unit of analysis because she was the one who practiced infant feeding method to her baby.

3.2.2 Sampling procedures and sample size

Purposive sampling procedure was used in this study. The choice was based on convenient access to specific individuals in a sample. Purposive sampling technique was used to select 6 clinics out of 24 PMTCT clinics, which HIV-positive mothers were attending. In this study, all mothers having babies aged 1 – 6 months were requested individually in a counseling room to take part in the study. Those HIV-positive mothers who were willing to be interviewed and visited at home were included in the sample. The sample size was calculated using a formula by Fisher *et al.* (1991). Forty three and 21 HIV-positive mothers were selected from Mwananymala and Sinza CTC respectively. Furthermore others were selected from PMTCT clinics including 9

HIV-positive mothers from Magomeni. 7 from Osterbay, 7 from Kimara and 3 from Tegeta, which made a total sample of 90 HIV-positive mothers.

3.3 Data Collection

Both primary and secondary data were collected to fulfill the objectives of this study.

3.3.1 Primary data

Primary data from the sampled respondents was collected using two structured questionnaires (Appendix 1and 2) with both open and close ended questions. The first questionnaire was aimed at collecting information from a respondent when visiting the clinic. The second questionnaire was meant to collect information when following the respondent at her home.

The first questionnaire sought information on general, social characteristics, information on the knowledge and awareness about mother-to-child transmission of HIV and its related factors. Others were on ways of reducing the transmission and constraints that influence the choice of infant feeding together with questions related to their feeding decisions. Other information probed from mothers by the first questionnaire included factors such as stigma from the family or community and general services provided from the host institutions.

The second questionnaire was used to interview the mother at her home two weeks after the first interview. Probing of some information like infant feeding plan, what is normally given to the baby, who normally feeds the baby, frequency of feeding and constraints faced was done. Moreover, the researcher assessed how the individual mother practised the infant feeding method by observing the preparation procedure

and hygiene, quantity given to the baby and type of replacement milk and complimentary foods given to the child.

Pre-testing of the two questionnaires was conducted at Kawe and Magomeni PMTCT clinics whereby ten HIV-positive mothers were included. Six of the mothers were from Magomeni and four from Kawe PMTCT clinics. They were purposively selected, and were not included in the final sample in the actual survey. Pre-testing was done so as to check the reliability and validity of the questions. As the result of the pre-testing, re-arrangement of some questions was done in order to get a good flow of information before the actual administration. All interviews were conducted in the local language of the respondent (*Swahili* language).

3.3.2 Secondary data

Secondary data on infant feeding, focusing on knowledge, practices and attitude of infant feeding options in the context of HIV/AIIDS was collected from different sources including books, journals, theses, websites, several published and unpublished government reports and health reports. Electronic databases such as CD-ROMs were also explored.

3.4 Data Processing and Statistical Analysis

Collected data from primary sources were checked for accuracy after the interview. The researcher verified data in order to make sure that the questions were reasonably answered and questionnaires were accurately filled in. Verified the data was then summarized and condensed from the questionnaires, organized and coded to facilitate data entry in the personal computer for processing. Data analysis was conducted using Statistical Package for Social Science (SPSS) computer programme

version 12.0. Descriptive statistics such as percentages, frequencies and cross tabulation were used to summarize the data into meaningful ways.

3.5 Study Limitation

Due to some difficulties related with the sampled mothers, it was not possible to reach six mothers for home visits, and therefore they were not interviewed with the second questionnaire. Partly the problem was due to wrong directions provided to the researcher by the mothers. It should be noted that in some of the residential areas, streets are not clearly marked or indicated. But, it might also be that some mothers did not want their relatives or neighbours to realize what was happening including their HIV status.

3.6 Ethical Considerations

Ethical considerations were strictly adhered to throughout the study by ensuring privacy and confidentiality. No information received from the study was given to, or disclosed to unauthorized person external to the team carrying out the study. All the respondents were informed about the nature of the study whereby verbal consent was obtained from each respondent before the administration of the questionnaires in the usual counseling room. The information obtained from the respondents was strictly used for the study purpose only. Based on this situation, the Municipal Director of KMC provided the research permit to facilitate the study.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

This chapter is set out to present the results and to discuss them according to the objectives that were mentioned earlier in chapter 1. The results are presented in several sections whereby the first describes the characteristics of the respondents and the environment in which they were found. They include their social economic and demographic characteristics and the HIV-situation surrounding them. Then several issues on knowledge, attitude and practices of infant feeding are presented. Finally, the institutional support provided is shown before opinion on how to improve the infant feeding in the context of PMTCT.

4.1 Distribution of Respondents in PMTCT Centres

Table 1 summarizes the distribution of the interviewed respondents (mothers) according to the PMTCT centres they were attending. The results show that the highest proportion of HIV-positive mothers were from Mwananyamala Clinic (47.8%) followed by Sinza (23.3%), Magomeni (10.0%), Kimara and Osterbay (7.8% each) and the lowest proportion was from Tegeta (3.3%). The representation differed because Mwananyamala and Sinza clinics are Care and Treatment Centres (CTC) whereby all HIV-positive mothers are referred after being diagnosed. This implies that most respondents were in CTC rather than in PMTCT clinics.

Table 1: Distribution of the interviewed respondents by centres

Location of centre	No. of respondents	Percent of the total
Mwananyamala	43	47.8
Sinza	21	23.3
Magomeni	9	10.0
Osterbay	7	7.8
Kimara	7	7.8
Tegeta	3	3.3
Total	**90**	**100.0**

4.2 Characteristics of the Respondents

4.2.1. Socio-economic and demographic

The characteristics considered include age of respondent, marital status, education level, household size, occupation and age of the index child.

4.2.1.1 Age

Table 2 presents the distribution of respondents by age. The majority of respondents were in the 25 – 30 years age category (44.4%) followed by 31 – 35 years age category (27.8%). Some of the mothers were below 25 years old (18.9%) while very few were above 35 years (8.9%). It should be noted that, under normal circumstances, the age considered to be appropriate for reproduction for a woman is between 18 and 49 years (TDHS, 2005). Therefore the age distribution of the sampled mothers is not surprising.

Table 2: Distribution of the interviewed respondents by age

Age category in years	Frequency	Percent
Below 25	17	18.9
25 - 30	40	44.4
31 – 35	25	27.8
Above 35	8	8.9
Total	**90**	**100.0**

4.2.1.2 Marital status

Marital status of respondents was classified into four main groups of single, married, separated and widowed (Table 3). The results indicate that most of the respondents were married (70%), followed by singles (21.1%), separated (7.8%) and widowed (1.1%).

Table 3: Distribution of the interviewed respondents by marital status

Marital status	Frequency	Percent
Married	63	70.0
Single	19	21.1
Separated	7	7.8
Widowed	1	1.1
Total	**90**	**100.0**

4.2.1.3 Educational level

Table 4 summarizes the education levels of the respondents. The results show that 75.6% of the respondents had primary school education, 18.9% had received secondary school education and 4.4% had no formal education. Only 1.1% had received college education. Education can facilitate the adoption of new innovations (Saint-Petersburg, 2006). More than 95% of the sampled mothers had received formal education.

Table 4: Distribution of the interviewed respondents by educational level

Education level category	Frequency	Percent
Primary education	68	75.6
Secondary education	17	18.9
No formal education	4	4.4
College education	1	1.1
Total	**90**	**100.0**

4.2.1.4 Household size

Table 5 indicates that the most common household size category was three to five members (54.5%), followed by one to two family members (27.7%). Table 5 also presents the distribution of household members by age categories. Sixty one percent of respondents did not have children less than five years of age at their homes. Majority of the households (85.6%) had only few (two to four) members who were above 14 years old.

Table 5: Distribution of the interviewed respondents by number of household Members

Number of family members	Frequency	Percent
(i) General (all the members)		
1 – 2	25	27.7
3 – 5	49	54.5
More than 5	16	17.8
Total	**90**	**100.0**
(ii) Household members 1 – 5 years old		
None	55	61.1
1	31	34.5
2	4	4.4
Total	**90**	**100.0**
(iii) Household members 6 – 14 years old		
None	43	47.8
1	24	26.7
2	20	22.2
3	3	3.3
Total	**90**	**100.0**
(iv) Household members above 14 years old		
Only one	5	5.6
2 – 4	77	85.6
More than 4	8	8.8
Total	**90**	**100.0**

4.2.1.5 Occupation and sources of income

The occupation and sources of income of respondents are summarized in Table 6. The occupation was classified into four main categories namely housewife, business, employed and those who were not working. The results in Table 6 indicate that most of the respondents were housewives (58.9%) followed by business (21.1%), employed (5.6%) and not working (14.4%). With regard to other sources of income apart from their occupation, 26.7% of respondents had small scale business, 2.2% food vending and the rest (71.1%) did not have any other source of income.

The occupation of the mother has a great influence on the method practised for infant feeding (Walker and Rolls, 1994). Option such as exclusive breast feeding for not less than six months can be done effectively by mothers who are not working, or working close to their homes as they are likely to breast feed on demand. ILO created the first global standard aimed at protecting working women before and after childbirth (ILO, 1998). Maternity protection legislation in Tanzania provides 84 days of paid maternity leave once in three years, irrespective of marital status to a working mother so as to have opportunity of practising exclusive breast feeding on the first months of the babies' life. This practice was mandated by the laws of the land i.e. Maternity Leave Act no. 4 of 1998 (URT. 2007).

Table 6: Distribution of respondents by occupation and sources of income apart from their occupation

Variable	Frequency	Percent
(i) Occupation		
Housewife	53	58.9
Business	19	21.1
Not working	13	14.4
Employed	5	5.6
Total	**90**	**100.0**
(ii) Sources of income		
None	64	71.1
Small scale business	24	26.7
Food vendor	2	2.2
Total	**90**	**100.0**

4.2.1.6 Age and sex of the index child

The children involved in this study were from the age of one month to six months. Table 7 shows the distribution of the children by age and sex. About 52% were baby girls and the rest (48%) were boys. The table shows the highest proportion to be of the age between 2 – 3 months (35.5%), followed by 3.5 – 4 months (26.7%) and

below 2 months (17.8%). Others were between 4.5 - 5 months (10%) and above 5 months (10%). The age below six months, is an ideal age for infant feeding practices in the context of PMTCT because it is a period when a baby depends solely on breast milk while she/he is also at risk of being infected with HIV from the breast milk of infected mother (WHO, 2005). Thus, an HIV-positive mother has to practice an appropriate infant feeding method to protect the children from getting infected from birth to six months of age. This has also been explained by UNICEF/ UNAIDS/WHO/UNFPA (2003), that HIV-infected mothers who choose to breastfeed or not to breastfeed are to be supported in their decisions and counselled about feeding options from birth to six months.

Table 7: Distribution of index children by age and sex

Variable	Frequency	Percent
(i) Sex of the child		
Female	47	52.2
Male	43	47.8
Total	**90**	**100.0**
(ii) Age of the child (in months)		
Below 2	16	17.8
2 – 3	32	35.5
3.5 – 4	24	26.7
4.5 – 5	9	10.0
Above 5	9	10.0
Total	**90**	**100.0**

4.2.2 HIV situation surrounding the respondents

Two issues were investigated here namely the year in which the HIV was diagnosed and disclosing of the HIV-status to relatives.

4.2.2.1 Diagnosis of HIV status

The results in Table 8 indicate the year by which a respondent was diagnosed to be HIV-positive. Most of the respondents (74.4%) were diagnosed in the year 2007 while 15.6% were diagnosed in 2006. Others were diagnosed in the other years as shown in the table. PMTCT program in Tanzania uses compulsory testing and counselling to every pregnant woman before delivery to get safe intervention including appropriate infant feeding practices to protect the baby from getting HIV (URT, 2005).

Table 8: Distribution of the interviewed respondents by the year they were diagnosed to be HIV-positive

Year of diagnosis	Frequency	Percent
2007	67	74.4
2006	14	15.6
2005	5	5.6
2003	3	3.3
2004	1	1.1
Total	**90**	**100.0**

4.2.2.2 Disclosing the HIV status to relatives

About 82% of respondents reported to have disclosed their HIV status to their relatives (Table 9). Majority of them disclosed to their husbands (50.0%), others to their mothers (41.9%) and sisters (31.1%) and only 13.5% disclosed to all the family members. It appears that HIV-positive mothers hardly disclosed their HIV-status to their brothers (4.1%). Being HIV-positive, greatly affects the respondent's communication with her relatives about infant feeding practices, largely because of the need to hide her HIV status (Doherty *et al.*, 2006a). The results indicate that respondents have been sensitized enough to disclose their HIV status to relatives.

Table 9: Distribution of the interviewed respondents and disclosing of the HIV status to their relatives

Variable	Frequency	Percent
(i) Disclosure of HIV status		
Disclosed HIV status to relatives	74	82.2
Did not disclose	16	17.8
Total	**90**	**100.0**
(ii) Type of relatives disclosed to		
Husband	37	50.0
Mother	31	41.9
Sister	23	31.1
Whole family	10	13.5
Brother	3	4.1

4.2.3 Antenatal characteristics

Ninety percent delivered in a normal way while only 10% was by caesarean section (Table 10). It was also noted that 96.7% had delivered at a healthy facility and only 3.3% at home. The results imply that mothers were sensitized enough to attend antenatal clinics. Moreover, it is the place where they are expected to get important services before and after delivery concerning their health and that of the baby.

Table 10: Distribution of the interviewed respondents by their antenatal characteristics

Variable	Frequent	Percent
(i) Delivering method		
Normal	81	90.0
Caesarean section	9	10.0
Total	**90**	**100.0**
(ii) Place of delivering		
Healthy facility	87	96.7
At home	3	3.3
Total	**90**	**100.0**

4.3 Knowledge and Awareness on MTCT

Three issues were investigated. They included Knowledge on the possibility of MTCT of HIV, perception of the factors which increase/decrease the risk on MTCT

of HIV and source of information about prevention of mother-to-child transmission of HIV (PMTCT).

4.3.1 Knowledge on the possibility of MTCT of HIV

Table 11 shows the results of knowledge test of respondents on the possibility of transmission of HIV from mother to child. About 97% were aware about possibility of transmission of the virus to the child. Majority (93.3%) were aware that transmission of the virus can be during breast feeding while others reported labour and delivery (68.9%). Only few (28.9%) thought of the possibility of transmission during pregnancy. The findings do not differ much with that reported by Kessy (2005) who observed that all HIV-positive mothers (100%) knew about the possibility of transmission of HIV from the mother to child. Another study by TFNC (2004) in three regions of Tanzania reported about 95% of surveyed HIV-positive mothers to be aware of the possibility of mother-to-child transmission of HIV.

Table 11: Distribution of respondents about the knowledge and awareness of the possibility of MTCT of HIV

Variables	Frequency	Percent
(i) Knowledge and awareness		
Have knowledge and awareness on MTCT	87	96.7
Have no knowledge	3	3.3
Total	**90**	**100.0**
(ii) Perception of mode of transmission at risk		
During breast feeding	84	93.3
During labour and delivery	62	68.9
During pregnancy	26	28.9

4.3.2 Perception of the factors which increase/decrease the risk on MTCT of HIV

Respondent's perception of factors that can increase or decrease the risk of transmission is shown in Table 12. About 69% indicated that the risk is increased by

mixed feeding while (67.8%) reported that cracking of the nipples and (35.6%) reported long duration of breastfeeding. Bad position and attachment was reported by 11.1%. On the other hand, 35.6% were aware that avoiding mixed feeding during breastfeeding would decrease the risk. Other factors reported to decrease the risk were very short duration of breast feeding (32.2%), ensuring good breast condition (20.0%), good position and attachment (4.4%) as well as avoiding sex during lactation (3.3%). Findings by Coovadia *et al.* (2007) indicated that the risk is higher if the mother has cracked nipples or mastitis (a type of breast inflammation) or if her baby has infections or sores in her/his mouth. Similarly, Coutsoudis *et al.* (1999) and Doherty *et al.* (2006b) showed that short exclusive breastfeeding of less than three months carried a significantly lower risk of HIV-1 transmission than mixed feeding. Dewey (2001) found that exclusive breastfeeding was likely to lower HIV-1 transmission compared to mixed feeding.

Table 12: Distribution of the interviewed respondents according to their perception of the factors that can increase or decrease MTCT of HIV

Variable	Frequency	Percent (n=90)
(i) Factors increasing the risk of transmission		
Mixed feeding	62	68.9
Nipples cracking	61	67.8
Long duration of breast feeding	32	35.6
Bad position & attachment	10	11.1
(ii) Ways of reducing the transmission of MTCT of HIV		
Avoid mixed feeding	32	35.6
Very short breast feeding period	29	32.2
Avoid breast feeding completely	23	25.6
Ensure good breast condition	18	20.0
Good positioning and attachment	4	4.4
Avoid sex during lactation	3	

4.3.3 Sources of information about PMTCT

Table 13 presents the sources of information about MTCT of HIV that were reported to be used by the respondents. About ninety eight percent of the mothers reported to get the information from health service providers and only 2% from family members. This implies that majority of the mothers were attending clinic, and therefore got the information from it.

Table 13: Distribution of the interviewed respondents according to reported source of information about MTCT

Source of information	Frequency	Percent
Health service providers	88	7.8
Family members	2	2.2
Total	**90**	**100.0**

4.4 Attitude of the Respondents Towards Infant Feeding Options

The respondents were asked to indicate on a five-point scale their attitude towards infant feeding methods in the context of HIV/AIDS. Table 14 summarizes the attitudes of the respondents towards the methods. Most of the respondents (62.2%) strongly agreed on commercial infant formula, the same as exclusive breastfeeding for less than 3 months (62.2%). Only 35.6% agreed on exclusive breastfeeding for four months. Ninety percent strongly disagreed on mixed feeding method. The greatest proportion of undecided category was shown on the expressed and heat treated milk (33.3%). Although respondents reported that the use of replacement milk will prevent HIV transmission to the child, they were still worried about the sustainability of the formula milk, which is very expensive. They were also concerned about the stigma associated with not breast-feeding. Bentley *et al.* (2005) reported of same situation in Malawi.

Majority of the respondents (62.2%) still insisted breast feeding for less than three months to let the child free from HIV infection and other infections associated with replacement milk. Mosha and Svanberg (1998) and Morrison and Greiner (2000) reported that replacement milk leads to an increased incidence of diarrhoea, malnutrition and death. WHO (2004a) guidelines show that replacement feeding should only be used when it is considered acceptable, feasible, affordable, sustainable and safe by an HIV-infected mother. Otherwise, exclusive breastfeeding is recommended during the first months of life.

The method of expressing the milk and heat treating is seen to be a complicated one to most respondents interviewed. This has also been noted by Leshabari *et al.* (2007) that the method is not likely to be acceptable in some communities where it is considered abnormal for a woman with a healthy baby to express her breast milk.

Table 14: Attitude of interviewed respondents towards different methods of infant feeding in the PMTCT context of HIV (as an appropriate method for feeding an infant to avoid MTCT)

	Attitude category (n=90)				
Infant feeding methods	**Strongly agree %**	**Agree %**	**Undecided %**	**Disagree %**	**Strongly disagree %**
Exclusive breast feeding for less than 4 months	28.9	35.6	1.1	12.2	22.2
Exclusive breast feeding for less than 3 months	62.2	21.1	3.3	5.6	7.8
Expressed heat treated milk	3.3	12.2	33.3	8.9	42.2
Commercial infant formula	62.2	33.3	1.1	2.2	1.1
Animal milk	25.6	43.3	3.3	8.9	18.9
Mixed feeding	1.1	3.3	3.3	2.2	90.0

4.4.1 Infant feeding methods known to respondents

Table 15 shows the mentioned types of infant feeding methods known by the respondent mothers. The method of exclusive breast feeding and early cessation before six months was known by the majority of respondent mothers (90.0%), followed by the use of replacement milk (81.1%). The use of expressed and heat treated breast milk was only known by 3.3%, while the use of light home-made porridge was reported by 13.3%. This indicates that the infant feeding in Tanzania is mostly dominated by breastfeeding as shown by TRCHS (1999) where 95% of the children were being breastfed. The use of replacement milk was also known as the strategy to prevent HIV transmission. Expressed heat treated milk was known by very few. This is probably because of the fact that breast milk is considered a ready prepared food for infant and therefore trying to heat it is taken to be unusual (Sardesai, 1998).

Table 15: Distribution of respondents according to reported type of infant feeding methods

Types of method mentioned	Frequency	Percent (n=90)
Exclusive breast feeding and early cessation before 6 months	81	90.0
Use of replacement milk	73	81.1
Light home-made porridge	12	13.3
Expressed and heat treated milk	3	3.3

4.4.2 Perceived advantages of the opted infant feeding methods

The results of the perceived advantages of various types of infant feeding methods the respondents were opting for are presented in Table 16. About 39% of respondents reported nutrition and protection against diseases while 36.7% mentioned nutrition only and 14.4% mentioned protection against diseases. Ten percent did not know any advantage of the feeding method they chose. Sardesai (1998) and Vinther and

Helsing (1997) reported breast milk to be the best food for an infant because it is energy-dense and rich in protective antibodies against diseases as well as all required nutrients in proportional amounts for the baby growth.

Table 16: The reported main advantages of the opted infant feeding methods

Advantage	Frequency	Percent
Nutritious and protection against diseases	35	38.9
Nutritious	33	36.7
Protection against diseases	13	14.4
Do not know	9	10.0
Total	**90**	**100.0**

4.5 Practices of Infant Feeding Options

4.5.1 Infant feeding methods practised by the respondents

Table 17(a) summarizes the results of methods of infant feeding that were reported to be practiced by the surveyed mothers. About 74% of mothers were practising exclusive breast feeding and early cessation before 3 months while commercial infant feeding formula was opted by 14.5%. Exclusive breastfeeding for six months was reported by 10% while animal milk was only 1.1%. This implies that whatever the crisis of HIV, the breast milk was still the best food to the respondents' infants. In Kenya (IBFAN-AFRICA, 2007), about 67% of surveyed HIV-positive mothers chose to breastfeed as they believed that breastfeeding was nutritionally optimal food for their infants. TFNC (2004) noted that 83% of surveyed HIV-positive mothers opted for breast milk because they knew that it was the most nutritious food to feed an infant after delivery. World Health Organization (WHO, 2005) also insists that breast feeding should continue to be protected, promoted, and supported among HIV-negative and HIV-positive mothers due to its importance. On the other hand, Table 17(b) shows the influence of individuals in deciding the method of infant feeding.

Health providers were indicated to influence more than half of respondents (58.9%) while 36.7% decided on their own and 4.4% were influenced by family members. The findings are consistent with a study done in South Africa by Doherty *et al.* (2006a) who reported that health workers have the greatest influence over mothers' initial infant feeding choices. Intensive counselling on infant feeding is frequently required especially during antenatal visits so as to enable mothers to decide on their own according to prevailing situation.

Table 17(a): Distribution of the interviewed respondents by their opted infant feeding method

Types of infant feeding	Frequency	Percent
Exclusive breast feeding & early cessation less than 3 months	67	74.4
Commercial infant formula	13	14.5
Exclusive breast feeding not more than 6 months	9	10.0
Animal milk	1	1.1
Total	**90**	**100.0**

Table 17 (b): Person influencing the mother on the chosen infant feeding method

Influencing person	Frequency	Percent
Health provider	53	58.9
On her own	33	36.7
Family members	4	4.4
Total	**90**	**100.0**

4.5.2 Comparison of reported and observed infant feeding practices

Table 18 summarizes respondents' infant feeding practices as reported during the interviews at the clinic and observed or reported when visited at home. Only 26.2% were observed to practise exclusive breast feeding as opposed to the reported 43.3%. The rest were using replacement milk including commercial infant milk (35.7%) or animal milk (38.1%). The use of replacement milk by the majority was probably because of stopping breast feeding their children at the age 3 – 4 months that was

reported by 96.2% (and observed among 93% of the mothers). This is similar to what has been reported by Morrison and Greiner (2000) that most of HIV-positive women use replacement milk due to early cessation of breast feeding at the age of 3 – 4 months.

About half of the respondents (52%) reported to breast feed on demand, but during home visits the rate was observed to be 68.2%. Similar pattern of HIV-positive mothers was reported in the study done in India that more than half of respondents' breast feed on demand (Nishi *et al.*, 2003). Likewise, TFNC (2004) reported the same that majority of mothers interviewed in three regions of Tanzania breast feed their babies on demand. On the other hand, more than ninety percent (93.9%) of the respondents reported to stop breast feeding their infants for the reason of avoiding HIV transmission to their infants. However, when visited at home only 80% confessed to stop breast feeding for that reason. It is also reported by Doherty *et al.* (2006b) that majority of respondents stop breast feeding for the reason of not transmitting HIV to their babies.

Table 18: Comparisons of reported and observed infant feeding practices

Variable	Reported (n=90)	Observed when visited at home (n=84)
	%	%
i) Practices of Infant feeding		
Breast feeding (exclusive at 3 -6 months of age)	3.3	26.2
Commercial infant formula	35.6	35.7
Animal milk	21.1	38.1
(ii) Breast feeding frequency		
On demand	52	68.2
More than ten times per day	48	31.8
(iii) Age of stopping breast feeding or changing the practice		
3 – 4 months	96.2	93
5 – 6 months	3.8	7
(iv) Reason for stopping breast feeding		
Not to transmit HIV to the child	93.9	80
Health worker advice	6.1	20

4.5.3 Starting complementary feeding

Table 19 shows respondents' opinions on what is the appropriate age for starting complementary feeding. The majority (52.2%) had the opinion that complementary feeding need to start at the age between 4 – 6 months while only 1.1% mentioned below 3 months. However, about 39% of the same respondents reported starting complementary feeding to their children at the age between 3 – 4 months, 11.1% between 1 – 2 months, and 2.2% between 5 – 6 months. About half of all the respondents (47.8%) could not tell when they started giving complementary foods to their babies. The results are also similar to the study done by TFNC (2004) which reported about 67% of children starting complementary feeding at the age below six months. Similar findings have been reported by Poggensee *et al.* (2004) in western Tanzania and Uganda. The findings indicate the need of encouraging mothers to feed

their babies with milk up to six months of age when it is recommended to introduce complementary feeding.

Table 19: Distribution of the interviewed respondents on complementary feeding

Variable	Frequency	Percent (n=90)
Opinion on the best age for starting complementary feeding		
Below 3 months	1	1.1
4 – 6 months	47	52.2
At six months	42	46.7
Reported age when complementary feeding started		
1 – 2 months	10	11.1
3 – 4 months	35	38.9
5 – 6 months	2	2.2
Could not tell	43	47.8

4.5.4 Types of complementary foods used by respondents and perceived risks associated with early complementary feeding

Table 20 shows the types of foods usually given when a baby starts complementary feeding. About 94% of respondents mentioned maize porridge, 47.8% mentioned replacement milk and 51.1% mentioned mashed food while 47.8% mentioned fruit juices. TFNC (2004) also reported most mothers to be using maize porridge as a complementary feeding. Mamiro *et al.* (2005) reported thin porridge prepared from maize flour as the most used complementary food in Kilosa district, Tanzania. About 62% of the respondents were aware of risks involved with early complementary feeding (Table 20). Increased risk of HIV Transmission was mentioned by 55.4% while poor digestion and constipation was perceived by 57.1%. Increased risks of other infectious diseases were mentioned by 26.8%.

Table 20: Types of foods used for complementary feeding and perceived risks associated with early complementary feeding

Variable	Frequency	Percent
(i) Type of foods used for complementary feeding (n=90)		
Maize porridge	85	94.4
Mashed food	46	51.1
Replacement milk	43	47.8
Fruit juice	43	47.8
(ii) Awareness about risk of giving complementary feeding early (n=90)		
Aware about the risk	56	62.2
Not aware	34	37.8
(iii) Perceived types of risks due to early complementary feeding (n=56)		
Poor digestion and constipation	32	57.1
Increased risk of HIV transmission	31	55.4
Increased risk of other infectious diseases	15	26.8

4.5.5 Assessment of practices of replacement milk

Respondents were assessed on how they practised replacement milk. The assessment involved who was normally preparing the milk, adherence to the instructions during the preparation, hygiene, and appropriateness of the utensils used. Table 21 shows that about 78% of the mothers prepared the milk themselves. Others included house maids (15.6%) and grandmothers (6.3%). More than half of the respondents (56.3%) followed correctly more than half of the procedures, 7.8% did correctly follow all the required procedures and about 36% could not follow correctly most of the procedures. Poor adherence to instructions during the preparation may lead to contaminated replacement milk. For example over-diluted milk has a great risk of a baby to be malnourished. Fertleman and Bentley (2003) observed that majority of formula fed to infants suffered from malnutrition because of over-dilution or risk of infections among Filipino families.

Only about 14% performed very good in hygiene, 53.1% good while 32.8% were poor in hygiene. Knowledge on proper preparation and general hygiene of replacement milk has a great role in the survival of the child. Mothers were advised on issues like washing hands using soap before preparation, sterilization of utensils used to prepare and feed the baby, safe water used in preparation and storage of the milk. The findings of some studies reported by WHO (2005) from developing countries found that infants who are not breastfed and who use replacement milk have a 6-fold greater risks of dying from infectious diseases in the first 2 months of life than those who are breastfed.

On the other hand, about two thirds (65.6%) used bottle for feeding their infants and 34.4% used a cup/bowl and spoon. According to Cullinan (2007), there are more deaths among babies who are formula fed (more than double that of exclusively breastfed babies) by three months. Many of these deaths are not related to HIV but are the result of diarrhoea and risks of bottle-fed due to gastro-intestinal infections caused by dirty water or unsterilised bottles. Veldman and Brink (2007) noted that 84% of the bottles were unfit for use in human consumption.

Table 21: Distribution of respondents according the way they practiced replacement milk

Variables	Frequency	Percent (n=64)
(i) Who is preparing the milk		
Mother	50	78.1
House maid	10	15.6
Grand mother	4	6.3
(ii) Adhering to given instructions for preparing the replacement milk		
Followed correctly more than half of the requirement procedures	36	56.3
Could not follow correctly most of the procedures.	23	35.9
Correctly followed all the required procedures	5	7.8
(iii) Hygiene in preparation and feeding		
Very good	9	14.1
Good	34	53.1
Poor	21	32.8
(iv) Utensil used		
Bottle	42	65.6
Cup or bowl and spoon	22	34.4

4.5.6 Constraints faced by mothers in feeding their infants

Respondents were asked about the constraints faced during practising infant feeding methods of their choice in the context of PMTCT of HIV. Table 22 summarizes the results of the reported constraints. About 68% of the interviewed mothers reported to face no constraints. Twenty three percent did not want their HIV status to be known. Hallander (2005) noted that very often infected mothers tend to fear stigmatization by family or community members and sometimes by the spouses. Others reported poor affordability of replacement milk (7.8%) and only 1.1% mentioned inadequate breast milk. During home visits, 43.3% of the respondents were observed to have no constraints. A large proportion (38.9%) also were being pressurized by the family

and other community members to give a baby other type of feeding not desired for PMTCT.

Table 22: Distribution of interviewed respondents by type of constraints faced during infant feeding (reported and observed)

Variables	Frequency	Percent
(i)Type of constraint reported at the clinic		
No constraints	61	67.8
Don't want her HIV status to be known	21	23.3
Poor affordability of replacement milk	7	7.8
Inadequate breast milk	1	1.1
Total	**90**	**100.0**
(ii) Type of constraint observed at home		
No constraint observed	39	43.3
Pressurized by the family and other community members to give a baby other type of feeding not desired for PMTCT	35	38.9
Poor availability of equipment for preparation & storage	6	6.7
Not visited	6	6.7
Too expensive to afford replacement milk	3	3.3
Preparation difficulties (can not follow the given instructions)	1	1.1
Total	**90**	**100.0**

4.6 Institutional Support Provided to HIV-positive Mothers in the Context of PMTCT

The identified institutional support that was provided to HIV-positive mothers included counselling on infant feeding options, home visits by infant feeding counsellors and other support which came from other sources.

4.6.1 Counselling and demonstration on infant feeding methods

The WHO guidelines reiterate that HIV-positive mothers have the right to make informed decisions on how to feed their babies and health workers should only support and assist them in whatever decision they make (WHO, 2005). Table 23 presents the summary of the support on counselling and demonstration of infant

feeding methods received. Ninety one percent of respondents were counselled about infant feeding options but only 25.6% received demonstration on infant feeding methods. Ninety percent were counselled at PMTCT clinics, 1.1% at home while 8.9% were not counselled at all. On the other hand, 73.2% of those reported to have received counseling got it during pregnancy, 11% got it before pregnancy, and 8.5% were counselled during delivery and 7.3% after delivery.

Poor demonstration of infant feeding options was observed in this study probably due to inadequate training and increasing workload to counsellors. Leshabari *et al.* (2007) noted that counselors were unable to give qualified and relevant advice to HIV-positive women on how best to feed their infants due to inadequate knowledge and skills because they were trained for only one week. In Rwanda, the same challenges have been observed whereby counselors received only a two-hour module devoted to the topic (Thairu, 2007). The low percent of mothers who received training by demonstrations indicates a need of intensive training program designed specifically to address this aspect of PMTCT as well as recruiting enough counselors to improve efficiency in those centres.

Table 23: Distribution of respondents counselled and demonstrated on infant feeding

Variables	Frequency	Percent
(i) Support received (n=90)		
Counselled on infant feeding options	82	91.1
Demonstrated on the infant feeding methods	23	25.6
(ii)Where was the support provided (n=90)		
Counselled at PMTCT clinics	81	90.0
Not counselled	8	8.9
Counselled at home	1	1.1
(iii) When was the support provided (n=82)		
Counselled during pregnancy	60	73.2
Counselled before pregnancy	9	11.0
Counselled during labour & delivery	7	8.5
Counseled after delivery	6	7.3

4.6.2 Home visits by infant feeding counsellors

The majority (88.9%) of the respondents were not visited by health service providers to see how they were doing with infant feeding options selected (Table 24). Only 11.1% were visited. Among the visited mothers, 10% were visited one month ago while the rest (90%) were visited over three months ago. The results are similar with the study done by Leshabari *et al.* (2007) in the northern part of Tanzania, which reported the inability of the counselors to make home visits. The study indicates the weakness of the program that no support was given to make sure there was a close follow up to the women after they had given birth.

Table 24: Distribution of respondents according to visits by infant feeding counselors

Variable	Frequency	Percent
Home visiting by infant feeding counsellor		
Not visited	80	88.9
Visited	10	11.1
Total	**90**	**100.0**
What was the last visit (n=10)		
Over three months	9	90.0
A month ago	1	10.0
Total	**10**	**100.0**

4.6.3 Other support provided to mothers with HIV

All the respondents (100%) reported that they were not getting any support or services other than what were provided in the clinics (PMTCT and CTC). This was also confirmed during home visits where it was observed that only 11 respondents (12.2%) were getting some form of support from family members. Table 25 shows the type of support received. The majority of those who got support were in form of animal milk (63.6%), commercial infant formula (18.2%) and cash money (18.2%). The findings indicate the need of encouraging family and community to support

HIV-positive mothers. IBFAN believes that in order for a woman to practice optimum infant feeding, she needs to be in a very conducive environment, getting emotional and physical support from her family, community and most important from her partner (IBFAN-AFRICA, 2007).

Table 25: Distribution of respondent according to supports they received from family members

Kind of support provided	Frequency	Percent
Animal milk and other food stuffs	7	63.6
Commercial infant formula	2	18.2
Money	2	18.2
Total	**11**	**100.0**

4.7 Opinions of the Respondents on How to Improve Infant Feeding in the Context of PMTCT of HIV

Table 26 summarizes the opinions given by the respondents on how to improve infant feeding in the context of PMTCT of HIV. Many HIV-positive mothers (40%) suggested that in order to improve infant feeding in ideal situation, exclusive replacement milk should be used. About 22.2% suggested that exclusive breast feeding and early cessation less than three months while 8.9% suggested mothers should attend clinics for more advice on infant feeding. Other suggestions given include exclusive breast feeding for not more than six months (3.3%) while 25.6% had no opinion. On replacement milk, mothers commented that replacement milk should be provided at the PMTCT clinic to assist those who choose not to breast feed.

Table 26: Distribution of the respondents by their opinions given on how to improve infant feeding in the context of PMTCT of HIV

Opinions	Frequency	Percent
Exclusive replacement milk	36	40.0
No opinion	23	25.6
Exclusive breast feeding and early cessation less than 3 months	20	22.2
Attending PMTCT for more advice	8	8.9
Exclusive breast feeding for not more than 6 months	3	3.3
Total	**90**	**100.0**

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Based on the findings of the study, the following conclusions can be made:

i. The study found that the HIV-positive mothers have an adequate knowledge about transmission of HIV from mother to child. Most HIV-positive mothers (96.7%) were aware that there is a possibility of an infant to be infected during breastfeeding. It was also noted that majority of pregnant women (97.8 %) attended PMTCT clinics where they were informed about mother-to-child transmission by health providers.

ii. The findings indicated that HIV-positive mothers believed that the best food for their babies after delivery was breast milk. At the same time, they considered replacement milk as a way of reducing HIV transmission to their children. In a real situation they opted to breastfeed the infants as most of them said that the replacement milk is expensive to start with though it is the best way to avoid mother-to-child transmission of HIV. Majority practice breast feeding (83.3%) as the initial choice. Stigma is another threat whereby mothers felt that if they do not breast feed, people may recognize them as HIV-infected. However, it was noted that many mothers did not adhere to guidelines on how to prepare replacement milk. Most of them have little knowledge on proper preparation and hygiene of the replacement milk.

A disparity between the reported and observed practices was noted whereby some respondents decided to hide the truth to the researcher as they were not practicing what they reported.

iii. Based on the study results, constraints like hiding the HIV status for the fear of stigma from the family members and community seems to be common among the respondents. This has some effects on decision of the initial choice of infant feeding method. Other constraints included poor affordability and sustainability of replacement milk especially commercial infant formula.

iv. The study found some weaknesses on the support services provided to HIV-positive mothers in the context of PMTCT. It has been noted that many weaknesses existed in the counselling being provided by the PMTCT programme. For example, no follow ups were done to a counselled pregnant mother after delivery. Mothers were not provided with sufficient skills of preparing appropriate PMTCT infant feeding. Only few mothers were trained on how to prepare the foods. Inadequate support with regard to infant feeding practices from family members, community or other institutions was also observed.

5.2 Recommendations

Recommendations made here are based on the researcher's views and some were given by the respondents themselves.

i. Health workers should assist mothers to make choices appropriate to their situation and to which they can adhere. Mothers who choose to breastfeed should be aware of the dangers of mixed feeding. They should also be shown the correct technique for suckling (attachment and position) for the child to get enough milk and to minimize the likelihood of breast disorders.

ii. Health workers (counselors) have an important role of teaching mothers who choose replacement milk on how to prepare the food properly, and then asking them to give a demonstration to ensure that they understand. Counselors must emphasize the need for sterile equipment and correct dilution, and the dangers of keeping prepared formula for long periods at room temperature. Safe and hygienic preparation of replacement milk, access to adequate supplies of clean water and fuel should be discussed in detail. Uses of a cup instead of bottles should be encouraged. Cessation of breastfeeding also should be discussed and planned for in advance. Since it was found out that there was inadequate services provided to the HIV-positive mothers from the institution, the study recommends that the relevant institution should arrange proper counselling; follow up with demonstrations and home visits. Even though they were referred to CTC clinic, during child vaccination visits, mother should be reminded about the need and importance of adherence to the method and if possible visited at home at least twice per month. Counselors should enable mothers to seek help if any problem arises.

iii. The study recommends that there should be training and sensitization of key people in the community to support infant feeding options in the context of HIV. Sensitization of members of the family and community will help to reduce stigmatization of the people living with HIV/AIDS. The government and development partners should think of free provision of replacement milk in PMTCT clinics to support mothers who choose not to breast feed and for those who stop breast feeding before six months of age of a child.

iv. There should be regular update training to counsellors on MTCT of HIV about infant feeding options to prevent HIV transmission and to ensure good nutritional status of the child. On that view, this needs a special experience and education on MTCT of HIV and infant feeding methods. There is a need for placing a nutritionist in every PMTCT clinic to educate on nutritional issues and to guide mothers on preparation of the top up milk and complementary foods for the infants.

v. Additional research is needed to assess the knowledge and skills of counsellors working on PMTCT clinics concerning infant feeding in the context of HIV. For prevention of mother-to-child transmission (PMTCT) of HIV to be successful, it is important to have skilled counselling to provide guidance and help HIV-infected mothers with their infants. Moreover a study to assess the nutritional status of the children born to HIV-positive mothers is required on the pattern of infant feeding options especially after six months of age.

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APPENDICES

Appendix 1: Questionnaire for HIV-positive mothers (interviewed at clinic)

Mother's questionnaire Questionnaire no.....

Name of the interviewer/ enumerator .....

Date of interview.....

Name of the clinic .....

Respondent name.....

A: Background information

1. Age of the respondent.....

Age of the Index child in months ..... Sex: Male = 1 Female = 2 [.....]

2. Marital status: (circle the appropriate answer).

1. Single
2. Married
3. Separated
4. Widow

3. No. of people in Household .....

Age group	**Number**
1 – 5 years	.....
6 – 14 years	.....
Above 14 years	.....

4. Education level:

1. No formal education
2. Primary school
3. Secondary school
4. College education

5. (a) Occupation of the mother
   1. Housewife
   2. Business
   3. Employed
   4. Not working

   (b) Location where mother work
   1. At home
   2. Home and away from home
   3. Away from home

   (c) Is there any other source of income? (Mention).....

B: Knowledge and awareness of the respondent mother on MTCT.

6. (a) Is there any possibility of MTCT?
   1. Yes ..Go to question 6 (b) [....]
   2. No [.....]

   (b)When can HIV pass from mother to the child?
   1. during pregnancy [.....]
   2. during labour and delivery [.....]
   3. during breastfeeding [.....]

7. If breastfeeding contribute MTCT, what factors increase the risk?
   1. Duration of breastfeeding [.....]
   2. Mixed feeding [.....]
   3. Nipples cracks [.....]
   4. Bad position and attachment of the baby during BF [.....]

8. Which ways can be used to reduce the risk of MTCT of HIV? (Mention)
   1. .....
   2. .....
   3. .....

9. (a) Delivery method	1. Normal	[.....]
	2. Caesarean section	[.....]
(b) Delivery place	1. At home	[.....]
	2. Health facility	[.....]

C. Attitude and practices towards infant feeding options.

10. Where did you get information on infant feeding options?

1. Health service providers [.....]
2. Family members [.....]
3. CBOs [.....]
4. NGO's [.....]

11. Mention any 4 types of infant feeding options which you know.

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

12. Which of the following infant feeding options would you find feasible?

For each of the following tick Strong agrees (i), agree (ii).undecided (iii). and disagree (iv), and strong disagree (v).

	Feeding options	i	ii	iii	Iv	v	Reasons
1	Exclusive breastfeeding to 4 months	1	2	3	4	5	
2	Exclusive breastfeeding with early cessation below 3 months.	1	2	3	4	5	
3	Expressed and heat treated breast milk	1	2	3	4	5	
4	Commercial infant formula	1	2	3	4	5	
5	Animal milk (Specify).....	1	2	3	4	5	
6	Mixed feeding below 6 months	1	2	3	4	5	

13. (a) What type of infant feeding options did you choose?

1. EBF & early cessation before 3 months. [.....]
2. EBF for six months [.....]
3. Expressed and heat treated breast milk [.....]
4. Commercial infant formula [.....]
5. Animal milk [.....]

(b) Who influenced you to choose that options?

1. Health providers [.....]
2. Family members [.....]
3. In laws [.....]
4. CBOs [.....]
5. On her own [.....]

(c) What are the advantages of such infant feeding?

1. Nutritious [.....]
2. for protection against diseases [.....]
3. for family planning [.....]
4. Don't know [.....]

14. (a) Are you still breast feed your child?

1. Yes .....go to question 14 (b) [.....]

2. No .....go to question 14 (c) [.....]

(b) How many times is the child breastfeed per day? .....

(c) When did you stop breast feeding (in months) .....

(d) Why did you stop breast feeding? ....

(c) What type of replacement milk used for the child?.....

15. What is your opinion on the best age for the baby to start complementary feeding?

1. below 3 months [.....]

2. 4 – 6 months [.....]

3. at 6 months [.....]

4. after 6 months [.....]

16. What types of complementary foods are normally given to a baby?

1. .....

2. .....

3. .....

17. (a) What type of fluid foods used to feed your child?

1.....

2. .....

(b) What types of solid food used to feed your child?

1.....

2. .....

18. When did you start to give such fluids/foods? (In months).....

19. (a) Are there any risks involved in early complementary feeding to a child?

1. Yes ..... go to question 20 (b) [.....]

2. No [.....]

(b) What are the risks? (List them) 1. .....

2. .....

D: Constraints faced by the mother on practicing infant feeding options

20. When did you diagnosed of the HIV-positive? .....

21. Did you disclose your HIV serostatus to your relatives?

1. Yes .....go to question 22 (a) [.....]

2. No ..... go to question 22 (b) [.....]

(a) Who are they (mention them) 1. .....

2. .....

(b) If not give reason .....

22. (a) Are you facing any constraints on infant feeding options of your chose?

1. Yes .....go to question 23 (b) [.....]

2. No [.....]

(b) Mention the constraint(s) 1. .....

2. .....

E: Services provided in the PMTCT and other institution to support infant feeding.

23. (a) Did you get nutrition counseling on infant feeding practices?

1. Yes .....go question 24 (b) [.....]

2. No [.....]

(b) When did you get such service?

1. before pregnancy [.....]

2. during pregnancy [.....]

3. during delivery [.....]

4. after delivery [.....]

(c) Where did you get? .....

24. (a) Were you demonstrated on procedures of such infant feeding options chosen?

1. Yes .....go question 26 [.....]

2. No .....go question 27 [.....]

25. How do you see the procedures/

(a) Do you practice? [.....]

(b) Are they understandable? [.....]

(c) Are they of benefit to you? [.....]

(d) All of the above [.....]

26. (a) Did you visited by infant feeding counselor from PMTCT?

1. Yes .....go question 27 (b) [.....]

2. No .....go question 28 [.....]

(b) What was the last visit?

1. A week ago [.....]

2. A month ago [.....]

3. Over 3 months [.....]

27. (a) Did you get any services from other institution than PMTCT?

1. Yes .....go question 28 (b) [.....]

2. No .....go question 30 [.....]

(b) How did you know such institution? By .....

1. Health worker [.....]

2. Family member [.....]

3. Mass media [.....]

(c) Who give you such services? .....

28. What kind of services do you get? ....

29. What is your opinion on improving infant feeding on PMTCT?

.....

THANK YOU FOR YOUR COOPERATION.

Appendix 2: Questionnaire for HIV-positive mothers (interviewed at home)

Practices observation questionnaire. Questionnaire no.....

Name of the interviewer/ enumerator .....

Date of observation.....

Respondent name.....

Age of the Index child in months .....

Infant feeding option .....

1. What is the child normally given (everyday)?

1. .....

2. .....

3. .....

2. Observation on a particular day

(a) Food / Replacement milk

(i) Type of food/ Replacement milk .....

(ii) Who is preparing .....

(iii) Knowledge on preparation .....

(iv) Who is feeding the baby.....

(v) Is the adequate amount given to a baby .....

(vi) Utensil used to feed the baby.....

(vii) Availability and affordability of the replacement milk.....

(viii) General hygiene in preparation and feeding.....

(ix) Availability of clean water .....

(b) Breast feeding

(i) Condition of the nipples .....

(ii) Positioning and attachment during breast feeding ....

(iii) Does the baby get adequate amount of milk per feed ....

(iv) How many times can a baby breastfeed ....

3. Support given to the mother towards infant feeding options.

Type of support	**supporters**
1.	.....
2.	.....

4. Changing of infant feeding Options

(i) Age in month .....

(ii) Reason for changing .....

5. Constraints faced during infant feeding

.....

.....

THANK YOU FOR YOUR COOPERATION