# RELATIONSHIP BETWEEN KNOWLEDGE LEVELS OF HIGHLY ACTIVE ANTIRETROVIRAL THERAPY (HAART) AND ADHERENCE LEVELS OF HAART AMONG HIV POSITIVE PREGNANT WOMEN AGED 15 TO 49 YEARS ATTENDING ANTENATAL CARE AT MARONDERA PROVINCIAL HOSPITAL FAMILY CHILD HEALTH DEPARTMENT, ZIMBABWE

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ABSTRACT

Vertical transmission of HIV from mother to child remains a problem in Zimbabwe and the world over. HAART adherence rate of at least 95% is essential and it is noted that it can reduce vertical transmission by less than 1%. However such high adherence rates could only be achieved when HIV positive pregnant women have optimum knowledge regarding HAART. The purpose of the study was to examine the relationship between knowledge of HAART and adherence levels among HIV positive pregnant women aged 15 to 49 years attending antenatal care Marondera Provincial Hospital Family Child Care Department. A descriptive correlation study design was used to guide the study. A sample of 80 participants was selected using systematic sampling. HIV positive pregnant women meeting the inclusion criteria participated in the study. Data was collected through interviews with the aid of a structured interview schedule. Pender's Health Promotion Model was used to guide the study. Frequency distribution, measures of central tendency and dispersion and inferential statistics were used to present findings in relation to the demographic variables, HAART adherence practices and knowledge regarding HAART. Pearson correlation coefficient test was ($r = 0.197$ p – value 0.081). The results showed that a weak positive non-significant correlation existed between adherence to HAART and knowledge regarding HAART. The findings of this study indicated that only 25% of the respondents had high levels of knowledge regarding HAART and only 17.5% had high levels of adherence hence one can safely infer that the moderate to low levels of knowledge in the majority of the respondents 75% could have a bearing on suboptimal adherence. The study recommends intensification of health education and counseling on HAART inorder to empower HIV+ pregnant women with relevant knowledge that could lead to attainment of optimum HAART adherence. Major challenges facing respondents on HAART were issues regarding disclosure for 33.3% and stigma and discrimination 23.1%. This points to need for midwives to address these important psychosocial barriers to optimum adherence by not only harnessing male participation in PMTCT issues but also through community involvement.

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# CHAPTER 1

# BACKGROUND AND ORGANIZING FRAMEWORK

## INTRODUCTION

This chapter covers the background of the study, problem statement and purpose of the study. The theoretical framework which guided the research study was outlined and the terms used in the study were conceptually defined. The research objectives and questions including the significance of the study to nursing will be outlined. The first Acquired Immune – deficiency Syndrome (AIDS) case was identified in Zimbabwe in 1985 according to the Ministry of Health and Child Welfare (MOHCW, 2011). Surveillance of Human Immuno-deficiency Virus /Acquired Immune-deficiency Syndrome (HIV / AIDS) cases to monitor trends and magnitude of the problem has been in place since 1987 to date (MOHCW, 2011). It was noted that the estimated numbers of people living with HIV / AIDS in Zimbabwe by 2010 included 1 012 649 adults aged between 15 to 49 years and among these 601 108 were women of child bearing age, 145 017 were children aged between 0 to 14 years (MOHCW 2011). From these statistics it was also noted that women comprised 57% of the estimated number of adults living with HIV/AID. It was stated that 25% of women who were attending antenatal care clinics were HIV positive and 25 to 45 % of these were at risk of transmitting HIV infection to their infants either during pregnancy, labour and delivery or through breastfeeding Zimbabwe Demographic Health Survey (ZDHS , 2010).

The MOHCC further reports that 10 to 12 percent of infants in Zimbabwe were infected with HIV through vertical transmission .In Zimbabwe the infant and under 5 mortality rates were noted to be 51 % and 78 % per 1000 live births respectively, (ZDHS, 2010/2011). However, due to the negative impact of HIV on the maternal health, Zimbabwe has realised a very high maternal mortality occurring as a result of the increased risk of malaria, tuberculosis

and infections such as genital tract infections in the HIV positive woman. Maternal mortality rate was recorded as 960 per 100 000 (ZDHS, 2010 /2011).

It was with this background that the need to reduce Mother to Child Transmission of HIV and reduce HIV/AIDS related disease burden and mortality among children and mothers that Zimbabwe adopted and implemented the Prevention of Mother to Child Transmission (PMTCT) programme (MOHCW, 1999). Zimbabwe has implemented the PMTCT programme while observing the four WHO strategic elements which include, primary prevention of HIV, preventing unintended pregnancies among women living with HIV, preventing HIV transmission from pregnant women living with HIV to their infants and providing appropriate treatment , care and support to mothers living with HIV and their children and families (MOHCW, 2011) . Zimbabwe adopted and implemented the WHO recommended PMTCT programme in 1999. It has progressed from use of the short course Zidovudine or single –dose Niverapine to the implementation of the WHO (2010) ARV guidelines which recommended the use of more effective ARVs for treating the HIV positive pregnant women and for prevention of Mother – to Child – Transmission of HIV(MOHCC, 2010).

The prescription and issuing of Highly Active Antiretroviral Therapy (HAART) to HIV positive pregnant women with a CD4 below 350c/mm has been in progress. HAART has been reported to be more effective in reducing vertical transmission of HIV and it also lowers the risk of HIV viral resistance than previous regimen (WHO, 2009. Early initiation by 14 weeks gestation of ARV in HIV positive pregnant women was effective in reducing Mother – to – Child Transmission (MTCT) of HIV by less than 5 percent in breastfeeding populations and less than 2 percent in non-breastfeeding populations, making a significant stride towards the virtual elimination of pediatric HIV (WHO, 2010). The final outcome would be the

creation of a paediatric HIV – free generation and an ultimate improvement in maternal health (WHO, 2010).

According to WHO (2010), in many developed countries paediatric HIV has been virtually eliminated through effective use of HAART. This therefore means that through the effective use of HAART by HIV positive pregnant women, Zimbabwe could also eliminate new paediatric HIV infections resulting in reduction of the child morbidity and mortality as well as maternal mortality rate. According to (Kak et al, 2011) without treatment, maternal HIV/AIDS could contribute by 18% of maternal mortality in the sub – Saharan region as a result of the related increased risk of malaria, tuberculosis including other infectious diseases. The introduction of the HAART will avert the increased susceptibility to these conditions by boosting maternal immunity. The desired goal for taking HAART is achieving maximal and durable suppression of viral replication, and the benefits would be reduced MTCT of HIV, reduced destruction of the maternal CD4 cells, prevention of viral resistance and promotion of immune reconstitution and slowed disease progression (WHO, 2010). Health workers would need to emphasise on these factors during the pre –art teaching sessions so as enforce the importance of HAART adherence among HIV positive pregnant women right from the beginning of antenatal care.

## Problem Statement

The HIV/AIDS pandemic has continued to impose great challenge upon the health of many people worldwide and more so among women of the childbearing age. It is noted that from a global perspective 33, 3 million people are living with HIV, among these are women of the child bearing age who are accounting for up to 15, 9 million (WHO, 2011). In sub – Saharan Africa 13 million pregnant women were living with HIV /AIDS and were receiving Highly Active Antiretroviral Therapy (WHO, 2013). In Zimbabwe, the Ministry of Health

and Child Welfare (MOCHW, 2010), reported that an estimated 1 012 649 adults aged between 15 and 49 years were living with HIV/AIDS of which 601 108 were women of child bearing age.

There is a link between maternal HIV/AIDS and the unborn infant because of the increased chance of transmission of HIV infection to the infant during pregnancy, delivery and breastfeeding (vertical transmission) (Kak et al, 2011). Among women who were attending antenatal care clinics, 25% of them were HIV positive and have a 25 to 45% increased risk of transmitting HIV infection to their infants (WHO, 2009). Besides that the maternal health is also compromised more in the presence of HIV infection in pregnancy so much that it is understood that the impact of HIV may contribute up to 18% of maternal deaths in the sub – Saharan region through increased risk of malaria, tuberculosis and other infectious diseases for HIV infected mothers (Kak et al, 2011). This therefore means HIV remains to be a major contributing factor of rising maternal deaths worldwide , and Zimbabwe is currently experiencing a high maternal mortality rate of 960 per 100 000 live births Zimbabwe Demographic Health Survey (ZDHS,2010/11) . At the same time, as a result of maternal HIV infection, there are high proportions of paediatric deaths attributed to paediatric HIV/AIDS related illnesses that have been reported worldwide. In Zimbabwe the infant and under 5 mortality rates are 51 per 1000 and 78 per 1000 live births respectively (MOHCW, 2012). According to Hampanda (2012), paediatric HIV is the major cause of the increased infant and child mortality rates in sub – Saharan African with the life expectancy of HIV positive infants being extremely short so much that one third of HIV positive infants die before their first birthday and over one half would die by their second birthday.

In order to curb these high infant and child mortality rates as well as reduce maternal mortality rate, Zimbabwe adopted and implemented the recommended WHO (2009) option B

of antiretroviral therapy. In this regimen HIV positive pregnant were being given triple therapy of Antiretroviral (ARVs) both for suppression of viral replication in order to reduce risk of Mother to child transmission (MTCT) of HIV and for the treatment of the mother's health. By November 2013 Zimbabwe progressed on to implement the WHO (2010) ARVs option B + in which HIV positive pregnant women are receiving triple therapy regardless of their CD4 count. The introduction of Option B + would enhance prevention of MTCT of HIV infection and enhance child survival and improve maternal quality of health.

However for this to be realised there is need for the attainment of a HAART adherence rate of at least 95% (WHO, 2010). When this level of HAART adherence is achieved it is reported that vertical transmission of HIV could be reduced by less than 1% (Hampanda, 2012). On another note adherence to HAART could only be effected when HIV positive pregnant women have knowledge that HAART are ARVs for which the benefits of taking include; suppression of viral replication, reduction in the risk of MTCT of HIV, improvement in the maternal quality of health. Knowledge of the benefits of taking HAART would motivate the women to commit themselves to taking HAART according to schedule to attain the desired goal of an HIV free infant and improved maternal welbeing.

The realization of ART benefits can only occur when mothers utilize the knowledge about Highly Active Antiretroviral Therapy, the purpose for which they had to be taken and the need to adhere to treatment protocol Wenger et. al, (1999). Knowledge that HAART would reduce the risk of vertical transmission of HIV infection to the unborn infant as well as improving the mother's health would be the chief motivator for the women to adhere to HAART treatment schedule. According to Boateng, Kwapong, and Agyei – Baffour (2013), patient's knowledge on HIV /AIDS, Prevention of Mother to – Child Transmission (PMTCT) and HAART had been shown to influence the HIV positive pregnant women's motivation and

uptake of antiretroviral (ARV) medicines for PMTCT. An optimum level of understanding of what HIV was by HIV positive pregnant woman, a belief that ART was effective in PMTCT of HIV infection, and that it prolonged maternal life, and the recognition that poor adherence could result in MTCT of HIV infection, viral resistance and treatment failure could enhance HAART adherence among HIV positive pregnant women (Wenger et al, 2013). According to the WHO (2010), in many developed countries paediatric HIV has been virtually eliminated through effective use of HAART. Implications are that through the effective use of HAART by HIV positive pregnant women, Zimbabwe could also reduce the incidence of paediatric HIV infections resulting in reduction of the child morbidity and mortality.

However studies show that mothers' knowledge and understanding the benefits of a health action stimulate someone into commitment to action (Boateng, Kwapong, Agyei – Baffour, 2013). According to Pender's Health Promotion Model (2006), when persons perceive the benefits of an action they are mostly likely to be committed into a health promoting action. This means that when HIV positive pregnant women have knowledge regarding HAART benefits, they would adhere to the HAART treatment schedule.

Currently there are few studies that have been conducted in Zimbabwe to analyze the knowledge of HIV+ pregnant mothers regarding HAART and other social structures in place hindering HIV+ pregnant mothers' PMTCT behaviour. In order to eliminate mother-to-child transmission of HIV, the knowledge that shapes the behaviours of HIV+ pregnant mothers to make decisions regarding adherence to PMTCT needs to be better understood and addressed.

## Purpose of the study

The purpose of the study was to examine the relationship between levels of knowledge regarding HAART and HAART adherence levels among HIV positive pregnant women aged 15 to 49 years attending antenatal care Marondera Provincial Hospital and Municipal Clinics

## Pender's Health Promotion Model

A theoretical framework defined as the abstract and meaningful logical structure that guides the development of the study and enables the researcher to link the research findings to nursing body of knowledge (Burns and Groove, 2005).

Pender's Health Promotion Model (HPM) (2006) was used to guide this study .The model focuses on a process that motivates individuals to engage in behaviours that are aimed at the enhancement of health. Commitment to carry out an important and specific action at the stipulated time was an important landmark to the beginning of a desired health behavior (Pender et. al., 2006). The health worker's role would be directed at raising consciousness related to health promoting behavior among individuals by giving health information.

The ultimate goal of Pender's revised 2006 HPM emphasised on the achievement of positive health outcomes. A sound understanding of the benefits of an action was the key to the development of self-confidence, identification and overcoming of barriers to a health action thereby enforcing the sense of commitment.

Health promoting behaviours are continuing activities that must be an integral part of an individual's lifestyle. Examples of such behaviours include early booking for antenatal care, taking HAART as instructed by the health care provider, regular attendance of the HAART review and supply clinic.

The theoretical bases of Pender's Health Promotion model (2006) was drawn upon the social cognitive theory, the expectance value theory and the nursing perspective of holistic human functioning. The social cognitive contribution emphasized on the attitude of "I can do it……..." and the expectance value theory "……and it will be worth it." This meant that once the individual developed these positive attributes through acquisition of the relevant health information, engagement into a health promoting behavior was enhanced.

Pender's social cognitive theory was drawn from the works of Bandura in which the author emphasised on self direction and self regulation as the ability to direct and control one's thinking and actions, perception of self efficacy which assist one to view self as having the ability to perform any identified set of actions (Masters, 2012).

Most importantly and significant to this study was the notion of the expectancy value theory that postulated that provided an individual acquired the necessary knowledge they were bound to undertake continuing positive actions with personal value that enhanced the achievement of desired outcome. Knowing the benefits of taking HAART by the HIV positive pregnant women for example, suppression of viral replication, reduction of MTCT of HIV would be the driving force to HAART adherence.

According to Pender et. al., (2006) revised Health Promotion model; the identified three major components included the Individual characteristics and Experiences, Behaviour Specific Cognition and Affect, and Behavioral Outcome.

The following discussed concepts were found relevant to the study.

## Individual characteristics

Individual characteristics are those factors which influence the uptake of HAART according to schedule in order to achieve the desired goal of reducing the risk of MTCT of HIV infection. These included personal biological factors, personal psychological factors, and socio -cultural factors. Personal biological factors such as age and strength, these determine perception of benefits of HAART and adherence to HAART schedule .Personal psychological factors included self – esteem, self –motivation and the woman's own perceived health status.

Self-esteem is a belief in personal worth. It allows individual to spent time on self improvement, free from feeling of selfishness or guilty. High self esteem results in better

physical performance. Achievement of self esteem reinforces and motivates health promoting behaviours in this case taking HAART as instructed by the health care provider.

Perceived health status appears to play a role in frequency and intensity of health promoting behaviours in this case adhering to HAART schedule. Knowing that HAART would improve maternal health at the same time reducing the risk of MTCT of HIV would motivate HIV positive women to adhere to HAART schedule.

Personal Socio-cultural factors education and socioeconomic status. High level of education has been associated with high levels of HAART adherence owing to understanding the benefits of HAART while low education with poor adherence which calls for close monitoring of such mother to ensure achievement of HAART Goal. Most importantly financial support is essential to provide for transport for attending HAART review and supply clinics as well as provision of adequate food supplies.

All these factors would be the steering force toward a positive health promoting action of taking HAART daily and on time, attending HAART review and supply clinics to ensure availability of adequate antiretroviral medicines at any given time. Feeling of self worth coupled with acquisition of relevant information about HAART would generate energy directed at adhering to HAART treatment schedule .The role of the health worker would be teaching HIV positive pregnant women that adhering to HAART schedule would result in suppression of viral replication, reduce the risk of MTCT of HIV as well as improving maternal health and quality of life. Understanding these HAART benefits would assist HIV positive pregnant women to move towards health promoting behavior which is adhering to taking their antiretroviral treatment as instructed by the health care provider and the attainment of reduction of MTCT of HIV infection.

## BEHAVIOUR-SPECIFIC COGNITIONS

Behaviour- specific cognition and affect are the most important components of the model which are considered the core for nursing intervention since they could modify an individual's health promoting behaviour based on how issues are perceived. These include perceived benefits of action, perceived barriers to action, perceived self- efficacy, activity-related and, interpersonal influences, all of which lead to commitment to a plan of action of adhering to the HAART schedule.

### Perceived benefits of action

Perceived benefits of action are the desired positive outcomes occurring as a result of health behaviour. Prior personal experience with positive outcomes or observation of others performing a health promoting behaviour increases the motivational importance of target behaviour. HIV positive pregnant women would likely become encouraged to keep HAART schedule upon observation of other women having HIV negative infants at end of pregnancy. Also appreciating the benefits of HAART towards improving maternal health and quality of life would act as a motivator to other women to adhere to HAART schedule.

### Perceived Barriers to action

According to Pender (2006), perceived barriers to action are conditions that are imagined or known to exist as real blocks to attainment of the required health promoting behaviour .Some HIV positive pregnant women would be faced with fears associated with stigma and discrimination, denied partner or significant others' moral and financial support challenges associated with disclosure of HIV positive, lack of or inadequate knowledge regarding HAART could also be a barrier. The role of the health care provider would be to provide counselling that assists the HIV positive pregnant women to identify and device strategies that enable overcoming any barriers to HAART schedule adherence.

## Perceived self-efficacy

According to Pender (2006) perceived self –efficacy is about an individual's personal judgment about their perceived ability to engage into a health promoting action. This could be a positive or negative inner based their understanding of what has to be done, why, how and associated benefits. A sound understanding of the benefits of HAART that adherence to HAART schedule increased the chances of having an HIV negative infant would be a motivator to adhere to HAART schedule. Feeling of self – worth and a positive outlook to attainment of improved maternal health would also enhance adherence to HAART schedule. The health professional should empower and increase the competence of the pregnant HIV positive pregnant women by offering the necessary health information about the benefits of taking HAART that the treatment reduces the risk of MTCT of HIV infection to the unborn infant. This in turn increases the mothers perceived self –efficacy thereby enhancing adherence. However there is a reciprocal relationship between perceived self –efficacy and activity –related affect. When activity – related affect is realised, the HIV positive pregnant women's sense of self –worth is also increased thereby enhancing the likelihood of commitment to action and actual performance of health promoting Behaviour.

## Activity – related affect

According to Pender's HPM activity – related affect is a subjective feeling which could be negative or positive about a health promoting behaviour. This feeling is felt before, during and after the performance of a health action and may motivate an individual to continue or discontinue a health action. Knowledge regarding the purpose of a health action instils self – confidence and ability to carry on with a health promoting action. In this study knowing the goal of HAART would have positive influence and direct the HIV positive pregnant women to taking HAART consistently.

## Interpersonal influences

According to Pender's, interpersonal influences are the individual's thoughts or beliefs about the behaviours, attitudes and beliefs of others about them. These beliefs may vary with each individual ranging from mild to very strong and they become associated positively or negatively with the desired health promoting behaviour. Among HIV positive pregnant women who are taking HAART, interpersonal influences are closely linked with outcomes of HIV status disclosure to spouse, significant family members who would take the role of a HAART treatment buddy. A HAART treatment buddy is an immediate relative who takes on the responsibility to remind the HIV positive pregnant woman to take ARVs daily and on time. These also provide financial support for transportation to attending HAART review and supply clinic appointments .This therefore means that positive interpersonal influences reinforced adherence to taking HAART while negative interpersonal influences would increase the risk of non – adherence to HAART schedule . The role of the health care provider would be to encourage the involvement of the spouse or sex partner or the significant family member during HAART adherence counselling clinics inorder to enforce HAART adherence for PMTCT.

## Commitment to a plan of action

Commitment to a plan of action marks the beginning of a positive behavioral process of health promoting activities. The HIV positive pregnant women would derive their commitment to adhere to HAART schedule from successful implementation of knowledge acquired about the PMTCT programme, the benefits of HAART such as of reducing the risk of MTCT HIV, improvement of the maternal health and quality of life provided that HAART adherence level of 95% and above was achieved. Commitment to health promoting behavior

would also involve the ability to identify and devise strategies to overcome barriers to HAART adherence for PMTCT.

## Behavioral Outcome

According to Pender's HPM (2006) behavioral outcome is final concept that marks the beginning of commitment to a plan action or health promoting activities. The positive health activities would be adherence to HAART schedule for PMTCT. The final goal of engaging into a health promoting behavior would be directed towards the attainment of positive health outcomes. In this study the positive health outcome would be reduction of MTCT of HIV infection as a result of adherence to HAART schedule. The ultimate goal would be having an HIV free infant and subsequent reduction in infant and child mortality rates, improved maternal health and quality of life as well as reduction in maternal mortality rate.

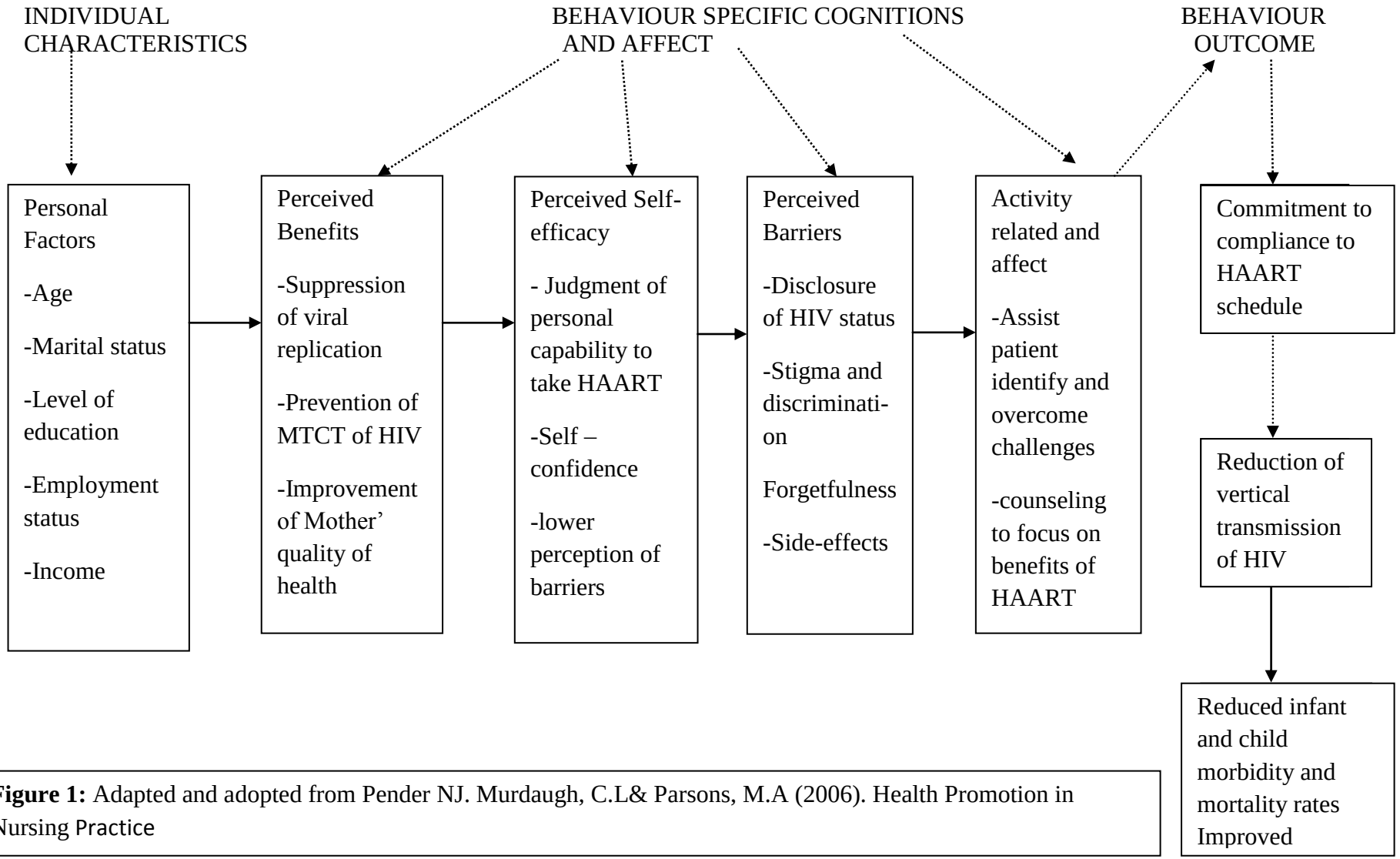


**Figure 1:** Adapted and adopted from Pender NJ. Murdaugh, C.L& Parsons, M.A (2006). Health Promotion in Nursing Practice

## DEFINITION OF TERMS

### HAART ADHERENCE

HAART Adherence is a voluntary commitment made by an individual to: stick to, be loyal to and to follow treatment guidelines based on an understanding of the information given to them (WHO, 2010).

### PMTCT

PMTCT is Prevention of Mother to Child Transmission of HIV infection from the HIV infected mother to the infant (WHO, 2009)

### MTCT

MTCT is the transmission of HIV infection from an HIV infected mother to her child during pregnancy, labour, delivery and breastfeeding (WHO, 2009)

### ARV

ARV means Antiretroviral drug (WHO, 2013)

### HAART

HAART is Highly Active Antiretroviral Treatment is the name given to aggressive treatment regimens used to suppress HIV viral replication and the progression of HIV disease. The usual HAART regimen combines three or more different drugs such as two nucleoside reverse transcriptase inhibitors (NRTIs) and a protease inhibitor(PI), two NRTIs and a non – nucleoside reverse transcriptase inhibitor (NNRTI ) or other such combination . These HAART regimens have proven to reduce the amount of active virus until it is undetectable by current blood testing techniques (Cichocki, 2009)

## HAART treatment failure

HAART treatment failure is the development of HIV virus resistance to treatment resulting in virologic failure which is defined as detectable plasma HIV viral load (WHO, 2009).

## Research Objectives

The study sought to:

1. Establish the HAART adherence levels among HIV positive pregnant women aged 15 to 49 years attending antenatal care at Marondera Provincial Hospital Family Child Health Department.
2. Determine knowledge of HAART among HIV positive pregnant women aged 15 to 49 years attending antenatal care at Marondera Provincial Hospital Family Child Health Department.
3. Examine the relationship between knowledge levels of HAART and adherence levels among HIV positive pregnant women aged 15 to 49 years attending antenatal care at Marondera Provincial Hospital Family Child Health Department.

## Research Questions

1. What are the HAART adherence levels among HIV positive pregnant women aged 15 to 49 years attending antenatal care at Marondera Provincial Hospital Family Child Health Department?
2. What is the knowledge of HAART among HIV positive pregnant women aged 15 to 49 years attending antenatal care Marondera Provincial Hospital Family Child Health Department?

3. What is the relationship between knowledge of HAART and adherence levels among HIV positive pregnant women aged 15 to 49 years attending antenatal care Marondera Provincial Hospital Family Child Health Department?

## Significance of the Study

In health care provision services, it is the nurse's responsibility to improve on the quality of life of patients and clients, well, sick or dying (Henderson, 2005). It is hoped findings of this study may be used to enhance the quality of educational intervention given to HIV positive pregnant women on benefits of HAART and effects of maintaining a 95% and above adherence level aimed at reducing MTCT of HIV infection. The research findings may contribute to knowledge development for the discipline of nursing through education and practice. The generated knowledge may evoke further research in nursing discipline especially midwifery. In midwifery education, research findings may be utilized to teach midwifery students evidence based midwifery practice thereby elevating the standard of midwifery education .However the research findings may also generate questions that may stimulate further study in the topic thereby further on assisting to improve on the infant and child mortality rates as well as improvement in maternal health and quality of life and education in the maternal mortality rate.

# CHAPTER 2

## LITERATURE PREVIEW

The literature review is an organised presentation about what has been published on a topic by scholars. It often includes a review of the researcher's topic under study. Literature review may also be done to review available researched data for determining the strength of evidence on which to base clinical midwifery practice. Literature review in research is especially conducted to propose or guide the conduct of research (Burns and Grove, 2005). In this chapter the review of literature will be discussed under the following headings: Highly Active Antiretroviral Therapy (HAART) adherence levels is the dependent variable, levels of knowledge regarding HAART (the independent variable ), relationship between levels of knowledge regarding HAART and levels of HAART adherence and the Pender's Health Promotion Model (HPM) theoretical framework. According to Polit and Beck (2010) literature review assists to pave the foundation of a study and could actually inspire new ideas.

### Adherence to Highly Active Antiretroviral Therapy (HAART) levels

Adherence to antiretroviral drugs by HIV positive pregnant women is critical if effective decrease in maternal plasma viral load to undetectable levels is to be attained. The decrease of maternal viral load to undetectable levels is necessary for reduction in the risk of MTCT of HIV infection to the infant (Kreitchmann et al, 2012). Adherence is the voluntary commitment that an individual makes to keep to, to stick to, to be loyal and take the ARVs according to schedule (WHO, 2009). Adherence could be affected only if the HIV positive pregnant women demonstrate full understanding about their HIV positive status, the PMTCT programme and the benefits of HAART on MTCT of the HIV infection. Adherence is all about taking Antiretroviral Medicines (ARVs) continuously and on schedule , attending of clinic appointments and observation of all relevant advice on diet and exercise and stress

avoidance, (Kagee et al, 2011).The first and foremost goal of ART is to attain a full and sustained viral suppression which allows for maximum immune reconstitution, while reducing the emergence of drug-resistance virus which is often characterised by progressive viral replication in the presence of ARV drugs. The overall outcome of Antiretroviral Therapy (ART) would be to reduce child morbidity and mortality as well as reduction of maternal mortality. (Machtinger, Bangsberg, 2006).

According to Machtinger and Bangsberg , (2006) if the overall goals of reducing infant and child morbidity and mortality , reduction maternal mortality rate is to be realised, at least an adherence rate of greater than 95% must be attained because this high level is necessary to achieve full and sustainable viral suppression. The need for a high HAART adherence level becomes the key to successful prevention of MTCT of HIV and elimination of new paediatric HIV infection.

Less than 95% adherence levels was associated with the generation of resistant mutant strains which are non-responsive to available ARVs and this poses a public health risk. WHO (2009) emphasised that optimal viral suppression is only attained at a greater than 95% adherence level for anything below 95% was associated with poor viral suppression and increased risk of MTCT of HIV infection . According to WHO (2009) the adherence level of 95% is described as a missing no more than 1 dose per month if taking HAAART once daily, missing no more than 3 doses per month if taking HAART twice a day and missing no more than 1 dose a week if taking HAART 3 times a day

Findings from a study conducted in Nigeria stated that HIV positive pregnant women who had maintained adherence levels that were greater than 95% during pregnancy explained that the desire to have HIV free infants at birth was their source of motivation (Ekama et al, 2011). Some of the written expressions by these women who desired to protect their infants

from MTCT of HIV included, “I want to protect my baby,” “I do not want to live with the guilt of infecting my baby,” and “I learnt my baby would not be infected if I took ARV drugs religiously.” Some HIV pregnant women gave the desire to remain healthy and live as their greatest motivator to maintain ART adherence (Ekama et al, 2011). Strengthening of the HIV positive pregnant women’s knowledge levels through education about the meaning of being HIV positive in MTCT and the benefits of HAART towards PMTCT of HIV would ensure an above 95% HAART adherence levels.

Poor adherence levels to ARVs ranging below 95% among HIV positive pregnant women could lead to suboptimal viral suppression, development of viral resistance, increased risk to MTCT and MTCT of resistance HIV strains (Ekama et al, 2011). According to Ekama et al, (2011) interrupting ARVs plasma titers would promote viral control regression thereby enhancing a rapid replication of the virus in large numbers accounting to greater than 10 to the power 10 viral particles per day. Bardeguez et al, (2008) research findings supported the same notion. However from the same research findings, it is noted that low ART adherence rates were prevalent among adolescents, active drug users and those women who had mental illness.

Pill burden, long –term treatment course, low knowledge levels regarding the benefits of HAART as well the HAART schedule were cited as some barriers to HAART adherence (Bardeguez et al, 2008). While on the same issue ART adherence, low levels of education, failure to disclose one’s HIV status were cited to be contributing factors to adherence to ART (Ekama et al, 2011). Similarly Kreitchmann et al, (2012) research findings identified low educational levels and health care confidentiality as contributing factors that were associated with HAART non-adherence among HIV positive pregnant women.

Kagee et al, (2011) in a study noted that fear of stigmatisation, forgetfulness and consumption of alcohol as barriers to adherence. Involving significant others including

immediate family members, close friends and male counterparts from HIV diagnosis throughout HAART adherence counseling sessions as well attendance of follow-up clinics would go a long way towards supporting these women. Provision of the so valued psycho – social support, meeting travel expenses, nutritious balanced diet, assistance in stress management would enforce HAART adherence. Most importantly male counterpart would further on assist with safer sex practices by correct, consistence use of condoms. Hence the urgent call that males should come on board in support of the PMTCT programme towards achievement of elimination of new HIV infection, besides that issues of disclosure would also be addressed.

However after the mentioning of these other factors militating against HAART adherence, Kreitchmann et al, (2012) research findings identified low educational levels and health care confidentiality as contributing factors to HAART non-adherence among HIV positive pregnant women. Conducting community awareness and mobilization campaigns for PMTCT support would support those with low educational levels and less empowered by increasing PMTCT support network which would encourage HAART adherence commitment among those with low education .Women empowerment through education becomes a key in this matter because education enhances level of understanding of health issues .Health worker confidentiality need to be enforced by keeping reminding them on value of observing professional nursing ethics during PMTCT training workshops so as enhance maximum utilization of available PMTCT services.

## Knowledge levels of HAART

HIV positive pregnant women who demonstrate understanding of their HIV disease and the relationship between treatment and adherence towards attainment of PMTCT are likely to live a more positive life expectancy as compared to those women without such an understanding (WHO, 2010). Better knowledge effect of ART and a positive attitude about the PMTCT is associated with increased chance of prevention of MTCT of HIV and elimination of new paedietric HIV cases among the populations and improving maternal and child health (Abajobir and Zeleke, 2013). This will mean that inadequate knowledge results in negative as opposed to anticipated positive and desired outcome of elimination of new paedietric HIV infection.

Some misconception about mode of transmission was identified whereby some women believed that contracting HIV infection was by bewitchment since they tested HIV positive while their spouses and children tested negative. These women indicated that they were seeking spiritual intervention at prayer camps and spiritualists. The issue of discordant HIV status could have been missed (Boateng, Kwapong and Agyei-Baffour, 2013). The importance of counselling about outcome of HIV test results becomes important to dispel misconceptions that may impact negatively on the scientific understanding of such outcomes. This may also increase the risk of lack of social support as well as promotion of discrimination and stigmatisation especially from the spouse who would have tested negative (Boateng, Kwapong, Agyei – Baffour, 2013).

However on the other hand from the same study some women demonstrated understanding of the mode of action of ART. These described ARV drug as a cup which works by covering the virus thereby preventing it from acting. Most of the HIV positive women of child bearing age indicated that the ART would make the virus weak which resulted

in disabling its ability to attack their immune system (Boateng, Kwapong, Agyei – Baffour, 2013). Perceived benefits of HAART influence adherence. Inadequate knowledge or lack of it compromises the women's commitment to HIV treatment adherence practices. It is therefore important to increase the levels of general knowledge regarding the benefits of HAART among HIV positive women and in increase the chance of reducing paediatric HIV infection (MOHCC, ZDHS, 2010/2011).

In Zimbabwe, it was noted that PMTCT knowledge levels increased with age and level of education and it was noted to be higher among urban than rural residents (ZDHS, 2010/2011). Urban women were more knowledgeable of PMTCT and the associated benefits of effective use of HAART in reducing MTCT of HIV than their rural counterparts (Abajobir & Zekele, 2013). Similar research findings in Ghana noted that knowledge about PMTCT was higher among women aged beyond 44 years of age (Boateng, Kwapong & Agyei-Baffour, 2013). In Ethiopia, research study findings revealed that women who had secondary or higher education had comprehensive knowledge about HIV / AIDS prevention and transmission .In the same study it was noted that a population based survey conducted in Zambia revealed that HIV prevalence decreased significantly among highly educated women aged 15 to 29 years as compared to those with lower education (Abajobir & Zekele, 2013).

Women empowerment through education influences their levels of understanding of health instructions provided by the health care provider; this in turn strengthens their commitment to long-term treatment with HAART. On the other hand a survey conducted in Zimbabwe indicated that residents of Matabeleland North were the least knowledgeable about MTCT, in which 74% women were knowledgeable than 48% of men, while in Mashonaland East Province 86% of women were knowledgeable about MTCT of HIV infection (ZDHS, 2010/2011).

According to Abajobir and Zekele, (2013), while women's empowerment is important, it is not just enough, their male counterpart should also be brought on board .Male involvement would strengthen HIV positive pregnant women's psycho- social support in this respect as issues of disclosure would also be addressed during HAART adherence counseling sessions. Once disclosure is done "positive living " strategies will be enhanced from a well informed and understanding partner, for example safer sex practices, stress management, provision of a nutritious and balanced diet.

Increasing community awareness through mobilization on PMTCT was found useful by increasing HIV positive pregnant women's participation in the PMTCT programme, a Zimbabwean experience. These findings were the result of a survey conducted in Zimbabwe on knowledge, attitude and practices in PMTCT programme which realised more women utilizing available PMTCT services (Abajobir & Zekele, 2013). Community awareness is speciously important because it ensures availability of more psycho- social support network. Issues concerning HIV / AIDS and PMTCT misconceptions would be addressed and therefore assist fighting against stigmatization and discrimination. Moses, Chama and Omotora (2008), noted the same findings in their research findings conducted in Northeastern -Nigeria.

The Relationship between levels of Knowledge of HAART and HAART Adherence levels.

According to Boateng, Kwapong and Agyei- Baffour (2013) in a descriptive cross sectional study which was conducted among 229 HIV positive women in the reproductive age 18-49 years in Ashonti Region of Ghana, findings revealed that more than 90% of the HIV positive pregnant women had inadequate knowledge about ART and PMTCT had default ART. Boateng, Kwapong and Agyei- Baffour, (2013) emphasizes that individual patient's knowledge and practices about HIV/AIDS, PMTCT and ART strongly influence pregnant women's motivation to adherence to ARVs for PMTCT. This same study revealed the

insignificant role of level of educational background on the women's negative health promotion behaviour. This could also assist health care providers to consider other possible causes of non – adherence such as socio – cultural beliefs and attitudes. An HIV positive pregnant woman's knowledge on benefits of ART in PMTCT is of great significance towards attaining desired adherence levels that ensure PMTCT and realise elimination of new pediatric HIV infection thereby improving maternal and child health. Knowledge influences good self-efficacy and positive decision making.

Wenger et.,al. (2013) yielded similar findings that revealed that sound levels of understanding about HIV by the patient together with positive belief that ART is effective for HAART adherence and prolongs life, while at the same time recognizing that poor adherence would result in viral resistance and treatment failure would assist the women to maintain HAART adherence. There is a relationship between knowledge regarding PMTCT and HAART defaulting. According to Boateng, Kwapong and Agyei- Baffour (2013), research finding stated a significantly high defaulting level among HIV positive women in the child bearing age who had inadequate knowledge on PMTCT and ART as compared to those who had adequate knowledge. In that same study it was revealed that women who had inadequate knowledge were 3, 5 times more likely to default ART as compared to those who had adequate knowledge. However lack of interest in knowledge regarding HIV and the benefits of taking HAART together with a belief that taking ART was harmful had negative impact on HAART adherence (Wenger et., al, 1999)

Marital status and religion were also noted to influence knowledge about PMTCT and HAART adherence because research findings revealed that married Christian women appeared knowledgeable and compliant to HAART treatment than single Muslim women (Boateng, Kwapong & Agyei- Baffour, 2013). According to Moses, Chama and Omotora (2008) male

involvement in the PMTCT programme would go a long way to provide the necessary psychosocial support to the HIV positive pregnant partner as this would encourage adherence HAART treatment. Knowledge about HIV /AIDS , benefits of HAART become the "KEY" towards elimination of new paedietric HIV infection and realisation of an HIV free generation. However according to Abajobir and Zeleke, (2013), marital status and religion were found not to be associated with knowledge about PMTCT and HAART adherence.

## Theoretical Framework

Chepkemoi and Mutulei, (2013) applied the Pender's Health Promotion Model (HPM), 1985 in to guide their research study. The objective of their study was to identify and document factors that influenced uptake of Intermittent Preventive Treatment (IPTp) sulfadoxine-pyrimethamine for malaria prevention among pregnant women. Health promotion provides the basis for individual health choices and it is consistent with concepts of perceived benefit and self – efficacy that is why some pregnant women made positive responses to available malaria prevention interventions than others. It is noted that pregnant women who received and understood malaria prevention health education from the health worker initiated antenatal care and commenced IPTp within the first trimester. These were noted to be 12 .7 times more likely to take their IPTp as compared to those whose source was the community health worker. Health education from a health facility was considered to be more authentic. Women who received psycho-social support from partners for ANC were reported to be 8.2 times odds of complying with IPTp treatment as compared to those who lacked partner support. Sound interpersonal relationships increase commitment to engage in health promotion behaviour. Women who were within a shorter walking distance of less than one hour had about 6.4 times the odds of taking IPTp as those who had more than 4 hours walking distance.

When intrinsic motivation is outweighed by external environmental conditions participation in health promotion activities is compromised (Chepkemoi, Mutulei, 2013).

In a study of 47 grades 7and 8 adolescent students, Curry(2009) found out that in order for type 2 diabetes mellitus to be prevented among that young generation there was need for an awareness campaign through health information giving to these children while at school as well as by use of theatre . Therefore there is a significant correlation between prevention of type 2 diabetes mellitus and implementation of the acquired preventive knowledge. According to Curry (2009) this information was expected to bring change of life style among the young people through engagement in health promoting behaviour such as increasing physical activity or making healthier food choices. By choosing Pender's HPM, the researcher wanted to utilise their behavioral sciences understanding of learning to the area of health promotion. Obesity was noted to be strongly related to type 2 diabetes mellitus as well as hypertension and social stigmatisation. Realisation of benefits of weight regulation would be a motivator of engaging into a healthy lifestyle. It was also noted nurses could rise up and assume an active role towards promoting health for overweight children by becoming advocates for policies which could help to develop behaviours that promote the wellbeing of overweight children. Nurses were encouraged to lead by example by living a healthy lifestyle (Curry, 2009).

In a related study on childhood obesity, Allen and College, (2011) analyzed the impact of educational intervention about childhood obesity and the associated risk factors. These researchers aspired to find out whether health education was a trigger of change of unhealthy lifestyles and realisation of obesity risk factors among children. WHO (1986) defined health promotion as the process of enabling people to increase control over and to improve health. Therefore equipping the young people with obesity risk factors, change of health style would

make a remarkable decline in childhood obesity. Study findings revealed that adequate utilization of available health information as a guide to engage eating healthy food while avoiding junk foods as well as performing physical exercises would reduce childhood obesity. Also teaching parents about the importance of controlling their children's eating habits by active discouragement of avoiding junk food in the home and to keep watch over their children thereby fostering healthy lifestyle and prevent childhood obesity.

## Summary

This chapter looked at literature on knowledge about HAART among HIV positive pregnant women and HAART adherence levels .Sound knowledge about HIV transmission, benefits of HAART toward PMTCT was found to be most essential. The effective use of HAART was associated with attainment of an above 95 % adherence level which is ideal towards prevention of vertical transmission of HIV infection. However some misconception about mode of HIV transition among some HIV positive pregnant women was found to militate against the ideal HAART adherence levels. Disclosure of HIV status to sex partner was noted to be significant towards effective HAART adherence .Therefore the urgent call for male's active involvement in the PMTCT programme continues to be emphasised. Community awareness of the PMTCT programme strengthens psycho-social support as well as protects against social stigmatisation and discrimination of the HIV positive pregnant women.

# CHAPTER 3

# METHODS

This chapter presence the research methodology under the following subheadings: research design, sampling plan, sample size, sampling procedure, conceptual and operational definitions of variables.

## Research Design

The research design is a detailed plan the researcher will use to find answers to the research questions (Polit and Beck, 2010). It clearly outlines the procedural framework that facilitates answering the research questions (Treece and Treece, 1999). According to Burns and Grove (2005), a research design is the detailed plan for conducting a study. A research design includes measures for control over factors that may distort the research findings; it guides the researcher in a way to achieve the ultimate goal. Research design is an important scheme of the study (Polit and Beck, 2010). Just as a detailed scheme of a house must be individualised to that house being built, so the research design must be made to suite the study. Each researcher then needs to choose the design which is most useful for their particular research purpose whether to observe in order to know, to know in order to predict or to predict in order to control or prescribe (Seaman, 2001).

The descriptive correlational research design was used in this study .This facilitated the examination of the relationship that existed between the dependent and independent variables that were examined in this study. In this study, the dependent variable was HAART adherence levels and independent variable was levels of knowledge of HAART. The advantage of correlational study design is that it identifies many inter – relationships in a short period of time.

## Sampling Plan

According to Burns and Grove (2005), a sampling plan describes strategies that would be used to obtain a study sample. A sampling plan enhances sample representativeness, reduces systematic bias and decreases the sampling error (Burns and Grove, 2005). The sample will be obtained from the accessible population. A sampling plan entails the selection of a sampling procedure, specification of the sample size and selection of a sampling procedure for recruiting the subjects (Polit and Beck, 2010). It is important to develop a sampling plan that produces accurate and meaningful information and it should be detailed to enable readers to replicate and critique the study (Polit and Hungler, 1999)

In this study a sample was selected from the population under study. A study population is the entire set of people or objects having some common characteristics for example all pregnant women from which a researcher selects the target population (Polit and Beck, 2010). The target population means a specific group of study population who satisfy the sampling criteria (Burns and Groove, 2005). In this study HIV positive pregnant women aged 15to 49 years who are taking Highly Active Antiretroviral (HAART) medicines were identified. The accessible population was the pool of subjects the researcher could get access to and they met all the stated selection criterion for the study. All HIV positive pregnant women aged 15 to 49 years who are taking HAART and were attending antenatal care (ANC) at Marondera Provincial Hospital and Municipal Clinics in Marondera (Burns and Groove, 2005). It is from the accessible population that the researcher selected the study sample using sampling method. The accessible population makes generalisation to the target population easier. In this study, the accessible population was the HIV positive pregnant women aged 15 to 49 years who were taking HAART and were attending ANC at Marondera Provincial Hospital and Municipal Clinics in Marondera.

## Sample Size

A sample size simply means the number of subjects in a particular study (Polit & Beck, 2010). Sample size is the most important issue in conducting and evaluating a quantitative research (Polit & Beck, 2010). Even if it is noted that there is no simple equation that could be used to determine the sample size needed, the fact remains that in quantitative research, a large sample is the most ideal (Polit & Beck, 2010). The ideal sample size would be obtained by calculating the sample size using the Dopson formula.

$$n = \frac{Z^2(P(1-P)}{\alpha/2 \quad \Delta^2}$$

Where Z alpha over 2 is equal to 1.96, P is the proportion of interest =88% (proportion is obtained from literature), Delta is equal to 0.05 effect size. When using the Dopson formula and the proportion from literature of 88%, the ideal sample size would be 167. However because of limited time to carry out the study, the investigator used the internationally acceptable sample size of 80. In research it is understood that Power is the ability of the study to adequately detect the purpose of the study which is determined by the sample size, the larger the sample the greater the chances and the smaller the sample size the lesser the chance. Power is the capacity of a study to detect differences in relationships that exist in the population (Burns & Grove, 2004). Using higher power means a larger sample size and also more financial resources are used.

Effect size is the extent to which the Null Hypothesis is false (Burns & Grove, 2004). It refers to the magnitude of the difference among variables influencing the sample size or other factors. Effect size must be determined in order to perform a power analysis for the

purpose of determining a sample size. A small effect size is 0.2, a medium effect size 0.5 and a large effect size is 0.8. As affect size increases, the sample size decreases and vice-versa (Burns & Grove, 1997).

## Sampling procedure

In this study systematic sampling procedure was used to select the sample. This procedure involves selection of Kth element from the list or group of elements .For example every $5^{th}$ person from the list. The formula was for calculating the Kth value is:

$K^{th} = \frac{\text{Accessible Population (N)}}{\text{Sample Size (n)}}$

The accessible population was the HIV positive pregnant women aged 15 to 49 years who were taking HAART and for more than a month. These pregnant women were attending antenatal care at Marondera Provincial Hospital and at the Marondera Municipal Clinics in Marondera. The selection of the respondents was based on picking every second woman who was reporting for antenatal care at the clinic during the period of data collection.

## Inclusion and Exclusion Criteria

Sampling criteria are the conditions that respondents meet for participating in a study (Burns and Grove, 2005). Sampling criteria includes observation of a list of characteristics important for membership in order to participate in a study (Burns and Grove, 2005). This therefore means that the sampling criteria determine the identification of the study sample selection. Sampling criteria involves the inclusion and exclusion criterion which helps to control extraneous variables, ensure homogeneity of a sample and provide guidelines for sample recruitment (Burns and Grove, 2005).

## Inclusion criteria

In this study HIV positive pregnant women aged between 15 and 49 years who were taking HAART and were attending ANC at Marondera Provincial Hospital and at the Municipal Clinics in Marondera were eligible for the study. These are women who had been taking HAART for more than a month and could speak English or Shona languages.

## Exclusion criteria

Exclusion criteria refer to the characteristics the investigator will not want in the study. In this study the exclusion criteria entailed all the women who met the inclusion criteria but reported to the clinic very ill and not in a suitable condition to be interviewed. The investigator used the systematic sampling method, a form of probability sampling to select the sample from the population under study. Probability sampling gave every woman who was meeting the sampling criteria an equal chance of being selected .Probability sampling provides a greater confidence in the representativeness of the sample selected.

The study was conducted at the Family Child Health Departments of the respective health institution. Audio visual privacy was ensured as one of the offices was neatly prepared for that purpose also the office was nearer to the PMTCT consultation and HAART supply offices to avoid stigmatisation during the section of the respondents. Two comfortable chairs were prepared, one respondent and other one for the investigator and a table to write on.

## Conceptual and Operational Definition

### HAART adherence levels

The HAART adherence levels among HIV positive pregnant women aged between 15 and 49 years who are taking HAART and were attending antenatal clinic at Marondera Provincial Hospital and at the Marondera Municipal Clinics was the dependent variable. This variable sought to determine the women's practice in relation to maintenance of HAART

adherence schedule. In this study, HAART adherence levels meant missing no more than 1 dose per month if taking HAAART once daily, missing no more than 3 doses per month if taking HAART twice a day and missing no more than 1 dose a week if taking HAART 3 times a day (WHO, 2009). Also that HAART adherence was the voluntary commitment of the HIV positive pregnant women to keep to, to stick to, to be loyal and take the ARV according to schedule (WHO, 2009). Adherence was all about taking Antiretroviral Medicines (ARVs) continuously and on schedule , attending of HAART review and supply appointments and observation of all relevant advice on diet and exercise and stress avoidance, (Kagee et al, 2011). This variable was measured by the use of the relevant structured interview questions. Questions on Section B of questionnaire were used to obtain information that measured the respondents' HAART adherence levels. Assessment of adherence to HAART schedule was done using structured interview questions. HAART adherence measurement was performed using the self –report and the pill count to verify information given whenever ARV tablets were available. Respondents were asked questions to which scores were allotted to elicit information relevant to measure their HAART adherence in pregnancy. These included the following questions; what gestational age at booking for antenatal care, this question was scored 0 to 2, 2 was allotted the correct and recommended gestational age of booking which was at 14 weeks and below to allow early initiation of HAART, 1 for age of gestation at 14 to 20 weeks and 0 for late booking at more than 20 weeks. Respondents were also asked whether they took their antiretroviral (ARV) therapy daily. Scores in this question were 0 to 1 in which 1 was for the answer always and 0 for sometimes. Another question was to find out whether the respondents took their ARVs on the same time daily. Scores to this question were 0 to 2, in which 2 was for always, 1 for sometimes and 0 for never. One question elicited answers to whether respondents had ever missed a dose of their ARVs. Scores were allotted 1 for No and

0 for Yes. Another question found out what each respondent did when they forgot to take their ARV tablets. Scores allotted were 0 to 2, in which 2 was for never forgotten, 1 for a correct explanation and 0 for an incorrect explanation. Another question sourced information about whether the respondents regularly attended their HAART appointment review and supply clinics. Scores were 0 to 2 in which 2 was for always, 1 for sometimes and 0 for never. A pill count was done to verify the self- reported HAART adherence. Scores allotted were 0 to 1in which 1 was for a correct pill count, 0 for incorrect pill count and 0 for non availability of pills for counting since respondents had not brought their pills to the clinic.

However just to make an assessment of these respondents' HAART adherence was not enough, their support system had to be checked also. A question to check if respondents had a treatment buddy to remind them to take their ARVs was asked, Scores allotted to this question were 0 to 1 were a score of 1 was for presence of a reminder whether husband or significant family member and a 0 for none.

The respondents' scores were as follows: 0-8 low adherence levels,9-11 moderate adherence levels and 12-13 high adherence levels.

Knowledge levels of HAART

The knowledge levels of HAART among HIV positive pregnant women aged 15 and 49 years who are taking HAART and were attending antenatal clinic at Marondera Provincial Hospital and at the Marondera Municipal Clinics was the independent variable. This variable sought to determine the information the women had which empowered them for HAART adherence

Questions on Section C of questionnaire were used to obtain information that measured the respondents' levels of knowledge of HAART. Respondents were asked various questions based on whether they had received information on antiretroviral therapy, information source,

benefits of HAART, effects of non – adherence to HAART, what to do when side effect were experienced and what to do when an ART dose was missed.

One question elicited information about whether the respondents had ever been educated about ARVs. This question had a sore of 0 to 1, 1 for Yes and 0 for No. The respondents' source of information was another variable that was checked on; no scores were allotted to this question because it was a descriptive question. Another question assessed the respondents' perceived knowledge about the benefits of HAART, scores allotted to this question ranged from 0 to 1 in which a score of 1 was allotted to each correct benefit stated and 0 for not sure or don't know. One question sourced the respondents' perceived effects of HAART non-adherence, scores that were allotted ranged from 0 to 2, 2 allotted for mother to child transmission of HIV, 1 for deterioration of mother's condition and 0 for do not know or not sure.

Another question verified what action respondents took when they experienced side - effects while taking HAART. Scores allotted were I for the correct answer which was to continue taking the ARVs and report to the health centre and 0 for each of the two wrong responses. The other question sourced information about what would be done when a dose of ARVs was missed, a score of 1 was allotted each of the three correct answers and 0 for not sure of what would be done. The other question sourced information about what respondents knew as the proper booking gestational age for ANC, a score of 2 was allotted for the correct response and 0 for the wrong response.

Respondents were also asked about the duration for which they had to take their ARVs. A score of 1 was allotted for the correct answer for life and 0 for each of the wrong answers. Another question asked checked on what drug taking reminder strategies respondents had, no scores were allotted to this descriptive question. Respondents were also asked state

what they perceived as challenges that could be interfering with adherence to HAART among HIV positive pregnant women on HAART, this was a descriptive question to which no scores were allotted.

The levels of knowledge scores were as follows: low levels of knowledge 0-8, moderate levels of knowledge 9-12 and high levels of knowledge 13-15.

The demographic variables pertain to the biologic, sociologic and educational characteristics of subjects and were measured by a demographic data structured interview schedule. These variables helped the investigator to determine whether demographic variables influenced the respondents' levels of knowledge of HAART and their HAART adherence levels. Section A on the structured questionnaire was used to source the respondents' demographic information.

## Instrument

An instrument is a device that an investigator uses to collect data (Polit and Beck, 2010). In this study interviews with the aid of the structured interview schedule was used to collect data. Interview involves verbal communication between investigator and respondent (Burns and Grove, 2005). The investigator asked questions and the respondents gave answers. Structured interviews were selected because they included strategies that provided increased amount of control by the investigator over the content of the interview. The face to face interview technique provided the interviewer with an opportunity to elicit more information through respondent's incidental comments, facial and bodily expression and of voice diction (Polit and Beck, 2006). The investigator had an opportunity to clarify some questions and to probe further if need raised. However the interviews have limitations in that the respondents may give socially desirable responses (Burns and Grove, 2005). This was minimized by

adopting and portraying a non- judgmental attitude as much as possible and the respondents were assured of confidentiality.

## Reliability

The reliability of an instrument is the degree of consistency or accuracy with which an instrument measures an attribute that is supposed to be measured (Polit and Beck, 2010). Reliability is considered a measure of the amount of random error in the measurement technique and is concerned with such characteristics as dependability, consistency, accuracy and compatibility (Burns and Grove, 2005). Reliability of the instrument was tested through pretesting of the instrument which was conducted at Makumbi District Hospital Family Child Health Department. In this exercise five HIV positive pregnant women who were taking HAART were interviewed. The questions which needed modification to ensure clarity were attended to, some additional questions added while some were omitted as found necessary. The use of a structured interview schedule enhanced reliability of the instrument in that the same questions were asked to the respondents in the same order using same wording

## Validity

Validity refers to the degree to which an instrument measures what is supposed to be measured (Polit and Beck, 2010).However Polit and Beck (2010) describe statistical, conclusion internal validity, external validity and construct validity. In this study construct validity of the questions was examined by fitness between the conceptual definitions and operational definitions (Burns and Grove, 2005).Content validity was assured by scrutiny of instrument by the supervisor. The investigator also carried out a pilot study to pre-test the instrument inorder to test the instrument's content validity.

## Pretesting of the instrument

Pretesting of the instrument was conducted to find out whether the instrument was user friendly and whether the respondents would understand the questions. Ary et. al., (2001) state that if the questions are to be effective, it is essential that the questions be pre- tested inorder to identify ambiguity, misunderstanding or other inadequacies. A pretesting exercise of the instrument was conducted at Makumbi District Hospital Family Child Health Department in Goromonzi district in Mashonaland East Province which was a similar setting and away from the actual study sites to avoid sensitisation of study sample. A sample of five HIV positive pregnant women aged 15 to 49 years who were taking HAART and were attending antenatal care were interviewed. The pretesting of the instrument assisted the investigator to modify some questions to ensure clarity, errors in questions that would result in controversial and ambiguous understanding and reactions were rectified before the study was conducted. Permission from the institution and respondents was obtained.

## Data collection plan

Data collection plan is a layout of series of events to be followed when gathering information for study from the respondents. Before embarking on data collection, the investigator obtained permission from the Joint Research Ethics and the Medical Research Authority through the Department of Nursing Science at the Institute of Continuing Health Education (ICHE). The researcher requested permission from the Provincial Medical Director for Mashonaland East Province to carry out the research study at the Marondera Provincial Hospital, Dombotombo and Nyameni Municipal Clinics Family Child care, antenatal care departments. Permission was also sought from the respective health institutions authorities to facilitate for respondents' interviews. The interviews were conducted during the week days between 0800 to 1530 hours from the 14$^{th}$ of April to the 6$^{th}$ of May 2014. Respondents were

selected as they reported in for antenatal care and every second woman was interviewed for twenty minutes after obtaining their consent.

## Ethical considerations

Full explanation of the study was given to the respondents in order to enable them to make informed choices to participate in the study .The respondents were told that the purpose of the study was to determine their levels of knowledge regarding HAART and their HAART adherence levels before administering the instrument .Each respondent signed the consent to show that they agreed to participate willingly. No incentives were paid to avoid enticing the respondents to participate in the study. No names were written on the interview schedule to ensure anonymity. Code numbers were used to ensure anonymity .The interviews were conducted in a private room in the family child health department and the data that were collected were kept under lock and key for security and confidentiality . The respondents were assured of confidentiality, but were informed that the information collected would be shared confidentiality with those directly involved in the research such as the supervisor of the research.

## Data collection Procedure

Data collection procedure is the actual process of gathering information by asking questions to the respondents and the respondents answering questions .Structured interviews were used for data collection. The purpose of the study was explained to the respondents, the investigator obtained a written consent before data collection. The respondents were assured of confidentiality and audiovisual privacy was ensured. The same questions were asked for all the respondents to ensure consistency .The interviews were held individually and each respondent was interviewed for twenty minutes while avoiding rushing through the questions and also allowing enough time for the respondents to give answers for the questions.

## Data analysis

Data analysis is defined as the process of careful scrutinising data by placing it in categories and applying statistical procedures in order interpret study findings (Polit and Beck, 2010).In this study tables and graphs were used for descriptive statistical analysis and the Pearson's Correlation for numeral data analysis test the relationship between knowledge regarding HAART and HAART adherence levels using SPSS A code book was used to identify and define each variable in the study. Data was analysed using both descriptive and inferential statistics. Data was analysed as follows: Descriptive statistics were used to analyse the demographic variables. Measures of central tendencies such as the mean, median and mode, frequency distribution percentage and measures of dispersion such as standard deviation were used to describe this data.

The dependent variable was HAART adherence levels which sourced to obtain information about the respondents' HAART adherence levels was measured as follows; descriptive statistics were used to analyse the variable about the challenges that the respondents faced while taking HAART. Measure of central tendency which included the mean median and mode, frequency distribution tables were used to describe the data

The independent variable was levels of knowledge regarding HAART which sourced to obtain information about the respondents' levels of knowledge regarding HAART; descriptive statistics were used to analyse the variable; what the respondents' source of information regarding HAART, what strategies to keep to time of taking HAART respondents had and about what the respondents perceived as the challenges that women who were taking HAART were experiencing. Measure of central tendency which included the mean median and mode, frequency distribution tables were used to describe the rest of the variables

The Pearson's correlation coefficient was used to analyse the relationship between levels of knowledge regarding HAART and HAART adherence levels.

# CHAPTER 4

# RESULTS

## Summary

The purpose of the study was to determine the relationship between knowledge levels of Highly Active Antiretroviral Therapy (HAART) and HAART adherence levels among Human Immuno – deficiency Virus (HIV) positive pregnant women aged 15 to 45 years attending antenatal care (ANC) at Marondera Provincial Hospital and Municipal Clinics. Structured interview schedule was used for data collection. A sample size of eighty (N = 80) respondents meeting the inclusion criteria were selected using systematic sampling.

The study sought to answer the following research questions:

1. What are the HAART adherence levels among HIV positive pregnant women aged 15 to 49 years attending antenatal care at Marondera Provincial Hospital and Municipal Clinics in Marondera.
2. What is the level of knowledge regarding HAART among HIV positive pregnant women aged 15 to 49 years attending antenatal care at Marondera Provincial Hospital and Municipal Clinics in Marondera?
3. What is the relationship between knowledge of HAART and adherence levels among HIV positive pregnant women aged 15 to 49 years attending antenatal care Marondera Provincial Hospital and Municipal Clinics in Marondera?

The Pender's Health Promotion Model (2006) was used to guide and analyse the study. The study findings were presented in three sections. The first section addressed the demographic data. The second section addressed adherence levels and the third section addressed levels of knowledge regarding HAART. The data was analyzed using both descriptive and inferential statistics. Social Science Packaging System (SPSS) was used to

analyze data. Frequency distribution and measures of central tendencies and dispersion were used to present the findings in relation to all study variables. Inferential correlation statistics were used to analyze the relationship between the HAART adherence levels (practice) scores and HAART levels of knowledge scores.

## Sample Demographics

Descriptive statistics were used to describe sample characteristics which were age, marital status, level of education, employment status and income.

Table 1 illustrates the demographic characteristics of the respondents. The age range was 15 to 44 years. The number of respondents aged between 15 to 19 years was 3 (3.7%), 20 to 24 years were 15 (18.8 %), 25 to 29 years were 11(13. 7%), 30 to 34 years were 27 (33. 8 %), 35 to 39 years were 18 (22. 5%) and 40 to 44 years were 6 (7. 5 %).

The number of respondents who were single was 9 (11.2 %), married were 67 (83 .8 %) and divorced or separated were 14 (5.0 %).

The respondents who went up to Primary level were 24 (30.0%), Zimbabwe Junior Certificate were 10(12.5 %), Ordinary level were 43 (53.8) and Advanced level were 3 (3.7 %).

The respondents who were unemployed were 57 (71. 3 %), self – employed were 17(21. 2%) and those who were formally employed were 6 (7 .5 %)

The respondents who earned below $150.00 were 24(30%); 18 (22.5) earned an income ranging $151 - $200, 20 (25%) $201 - $300, 7 (8.75%) $301-400, 7(8.75%) $401 – 500 and those whose income ranked above $500 were 4(5.0%).

Table 1: Sample Demographics

N = 80

| Variable | Frequency | Percentage |
|---|---|---|
| Age (years) | | |
| 15 – 19 years | 3 | 3 .7 |
| 20 – 24 years | 15 | 18 .8 |
| 25 – 29 years | 11 | 13.7 |
| 30 – 34 years | 27 | 33. 8 |
| 35 – 39 years | 18 | 22.5 |
| 40 – 44 years | 6 | 7.5 |
| Marital status | | |
| Single | 9 | 11.2 |
| Married | 67 | 83.8 |
| Divorced/Separated | 4 | 5.0 |
| Level of education | | |
| Primary | 24 | 30.0 |
| ZJC | 10 | 12. 5 |
| O Level | 43 | 53.8 |
| A Level | 3 | 3.7 |
| Employment status | | |
| Unemployment | 57 | 71.3 |
| Self – employed | 17 | 21.2 |
| Formally employed | 6 | 7.5 |
| Family total monthly income | | |
| Below $150 | 24 | 30.0 |
| $151- $200 | 18 | 22.5 |
| $201 - $300 | 20 | 25.0 |
| $301 - $400 | 7 | 8.75 |
| $ 401 - $500 | 7 | 8.75 |
| Above $500 | 4 | 5.0 |

## HAART adherence levels

Table 2 and 3 show data on the dependent variable. HAART adherence level was the dependent variable in this study. Respondents were asked questions to elicit information relevant to measure their HAART adherence levels in pregnancy. HAART adherence measurement was performed using the self –report and the pill count to verify information given whenever ARV tablets were available. With regards to gestational age at booking for antenatal care, 51 (63.75%) booked at 14 weeks and below, 3 (3.75%) booked at between 14 and 20 weeks, 26 (32.5%) at more than 20 weeks.

Respondents were also asked whether they took their antiretroviral (ARV) therapy daily and all the 80 (100%) stated that they always took their ARVs on each day. Another question was to find out whether the respondents took their ARVs on the same time daily and 69 (86.2%) stated always, 9 (11.3%) sometimes and 2 (2.5%) never.

One question elicited answers to whether respondents had ever missed a dose of their ARVs and 72 (90%) stated that they had not missed a dose while 8 (10%) had missed a dose. Another question found out what each respondent did when they forgot to take their ARV tablets and 58 (72.5%) reported never forgot, 14 (17.5%) gave correct explanation about what had to be done and 8 (10%) gave incorrect explanations.

Another question sourced information about whether the respondents regularly attended their HAART appointment review and supply clinics. The responses to this question were that 75 (93.8) always attended, 2 (2.5%) sometimes and 3 (4.9%) never kept their HAART appointments.

A pill count was done to verify the self reported HAART adherence and 32 (40%) had a correct pill balance in relation to a month's supply, 1 (1.25%) had an incorrect pill count for

the expected balance while 47 (58.75%) did not bring their ARV tablets to the antenatal clinic visit.

A question to check if respondents had a treatment buddy to remind them to take their ARVs was asked, responses to this question revealed that, 46 (57.5%) were reminded by their husband or sex partner, 14 (17.5%) by a significant family member while 26 (32.5%) indicated that they had none.

The challenges being faced by the respondents while taking HAART were also checked and respondents demonstrated a variety of challenges that could interfere with HAART adherence. The bigger percentage, 52 (65%) indicated that they had no challenges at all, 2 (2.5%) once had experienced stock out of ARVs, one of them had visited some place away from her usual HAART review and supply health center, she did not know how she would go about it to get her treatment, while the other woman had an emergency admission into hospital for four days for the stabilization of severe pregnancy induced hypertension following an ANC visit, no one brought her ARVs to hospital. The following were the different challenges given by the respondents, lack of disclosure were 4 (5%), some experienced side – effects, and these accounted for 19 (23.8%) of the respondents, stigma and discrimination were 3(3.8%) and forgetfulness were 3 (3.8%).

An overall adherence score was calculated for each of the adherence variables discussed above and the possible minimum score was 0 while the maximum score was 13. In this study a score of 13 indicated the highest level of adherence while 0 was absolute non – adherence .The respondents' scores ranged between 2 and 13 .The mean score for the dependent variable was 9.71 and the median score was 10.

Table 2: HAART adherence levels

N = 80

| Variable | Frequency | Percentage |
|---|---|---|
| Gestational age at booking for ANC | | |
| At 14 weeks and below | 51 | 63.8 |
| Between 14 and 20 weeks | 3 | 3.7 |
| At more than 20 weeks | 26 | 32.5 |
| Whether took tablets daily | | |
| Always | 80 | 100 |
| Whether took tablets around same time daily | | |
| Always | 69 | 86.2 |
| Sometimes | 9 | 11.3 |
| Never | 2 | 2.5 |
| Missed a dose of ARV in the past month | | |
| No | 72 | 90 |
| Yes | 8 | 10 |
| What to do when a dose of ARV was forgotten | | |
| Never forgotten | 58 | 72.5 |
| Correct | 14 | 17.5 |
| Incorrect | 8 | 10.0 |
| Whether kept HAART review and supply dates | | |
| Always | 75 | 93.8 |
| Sometimes | 2 | 2.5 |
| Never | 3 | 3.7 |

Table 3: HAART adherence levels

N = 80

| Variable | Frequency | Percentage |
|---|---|---|
| Pill Count | | |
| Correct | 32 | 40.0 |
| Incorrect | 1 | 1.3 |
| Pills not available | 47 | 58.7 |
| If had reminder to take ART *( multiple responses)* | | |
| Husband /Sex partner | 46 | 57.5 |
| Significant family relative | 14 | 17.5 |
| Do not have | 26 | 32.5 |
| Challenges faced by respondents *( multiple responses)* | | |
| Lack of disclosure of HIV status | 4 | 5.0 |
| Side effects of ARVs | 19 | 23.8 |
| Stock outs of ARVs | 2 | 2.5 |
| Stigma and discrimination | 3 | 3.8 |
| Forgetfulness | 3 | 3.8 |
| None | 52 | 65 |

Table 4 shows the respondents' HAART adherence scores, 1(1.2%) had a score of 2, 4(5.0%) score of 5, 4(5.0%) score of 6, 6(7.5%) score of 8, 16 (20%) had a sore of 9, 16 (20%) score of 10, 19(23.8%) score of 11, 12(15%) score of 12, 2 (2.5%) score of 13.

Table 4: HAART Adherence Scores

N=80

| Adherence score | Frequency | Percentage |
|---|---|---|
| 2 | 1 | 1.2 |
| 5 | 4 | 5.0 |
| 6 | 4 | 5.0 |
| 8 | 6 | 7.5 |
| 9 | 16 | 20.0 |
| 10 | 16 | 20.0 |
| 11 | 19 | 23.8 |
| 12 | 12 | 15.0 |
| 13 | 2 | 2.5 |
| Total | 80 | 100.0 |

Table 5 summarises the respondents' HAART adherence levels, 15 (18.7%) had low levels of adherence, 51 (63.8%) moderate adherence levels and 14 (17. 5%) demonstrated high HAART adherence levels.

Table 5: HAART Adherence Scores

N=80

| Adherence level | Frequency | Percentage |
|---|---|---|
| Low adherence (0-8) | 15 | 18.7 |
| Moderate adherence (9-11) | 51 | 63.8 |
| High Adherence (12-13) | 14 | 17.5 |

## Knowledge levels of HAART

Knowledge of HAART was the independent variable of this study. Section C in the structured questionnaire gathered information on the levels of knowledge of HAART that the HIV positive pregnant had.

Table 6 and 7 shows the distribution of respondents regarding whether they had received information on antiretroviral therapy, information source, benefits of HAART, effects of non – adherence to HAART, what to do when side effect were experienced and what to do when an ART dose was missed.

When asked if respondents had ever been educated about ARVs, 79 (98.8) except 1 (1.2%) had received information. On source of information, 46 (57.5%) received information from the nurses while 36 (45.0%) from counselors and 1 (1.2%) received information from a family relative.

On the benefits of HAART, 47 (58.8%) gave the reason of suppression of viral replication, 76 (95%) PMTCT of HIV, 66 (82.5%) improvement in the maternal health. The respondents also gave varied responses when asked about what the effects of HAART non-adherence were , 70 (87.5%) said MTCT of HIV infection, 14 (17.5%) transmission of drug resistant HIV strain ,73 (91.2%) deterioration of the mother's health and 1 (1.2%) did not know or not sure of the effects.

When respondents were asked about what they would do if they experienced side – effects while taking HAART, 77 (96.2%) stated that they would continue taking the ARVs and report the health centre , 2 (2.5%) would continue taking the ARVs and consult others while 1 (1.3%) would stop taking the ARVs immediately. Scores were allotted I for the correct answer which was continue taking the ARVs and report to health centre and 0 for each of the two wrong responses.

The other question sourced information about what would be done when a dose of ARVs was missed, 22 (27.5%) would take the dose as soon as they had remembered and when the time interval was less than six hours from time when the tablet was meant to have been taken, 28 (35.%) would skip the missed dose if six hours would have elapsed from the time when tablets would have been taken , 29 (36.2%) would not take a double dose the next time and 47 (58.8%) were not sure of what could be done.

The other question sourced information about what respondents knew as the proper booking gestational age for ANC, 67 (83.8%) said at 14 weeks and below, 2 (2.5%) at more than 20 weeks and 11 (13.7%) were not sure or did not know.

When asked about for how long respondents were supposed to take their HAART, 78 (97.5%) stated for life, 1(1.3%) reported during pregnancy and 1 (1.2%) stated up to when they weaned their baby.

When asked about what drug taking reminder strategies respondents had , the following were their responses , 60 (75%) used the cell phone alarm, 47 (58.8%) , 18 (22.5%) were reminded by significant family relative , 7 (8.8%) used the news on the radio , 1 (1.2%) meal time while 1 (1.2%) had no one to reminder.

Respondents were also asked to state what they perceived as challenges that could be interfering with adherence to HAART among HIV positive pregnant women on HAART; 26 (33.3%) stated that lack of disclosure of one's HIV positive status, 17 (21.8%) gave side effects of the medicine, 2 (2.5%) stock outs of ARVs, 18 (23 .2%) stigma and discrimination, 7 (9.0%) stated forgetfulness while 27 (34.6%) thought there were no challenges.

Table 6: Knowledge levels of HAART

N=80

| Variable | Frequency | Percentage |
|---|---|---|
| Ever received health education on Antiretroviral therapy | | |
| Yes | 79 | 98.8 |
| No | 1 | 1.2 |
| Source of information on HAART (*multiple responses)* | | |
| Nurses | 46 | 57.5 |
| Counselors | 36 | 45.0 |
| Significant family relative | 1 | 1.2 |
| Benefits of taking HAART (*multiple responses)* | | |
| Suppression of viral replication | 47 | 58.8 |
| Prevention of mother to child transmission of HIV | 76 | 95 |
| Improvement in maternal quality of health | 66 | 82.5 |
| Effects of HAART non-adherence (*multiple responses)* | | |
| Mother to child transmission of HIV infection | 70 | 87.5 |
| Transmission of drug resistant HIV strain | 14 | 17.5 |
| Deterioration of mother's health | 73 | 91.2 |
| Do not know /not sure | 1 | 1.2 |
| What to do when side effects experienced | | |
| Continue taking ARVs and report to health centre | 77 | 96.2 |
| Continue taking ARVs and consult others | 2 | 2.5 |
| Stop taking ARVs immediately | 1 | 1.3 |
| What to do when an ARV dose was missed(*multiple responses)* | | |
| If less than half the time to the next dose , I take the dose as soon as I remember | 22 | 27.5 |
| If more than half the time to the next dose , I skip the missed dose | 28 | 35 |
| I do not take double dose next time | 29 | 36.2 |
| I am not sure of what to do | 47 | 58.8 |

Table 7: Knowledge levels of HAART

N=80

| Variable | Frequency | Percentage |
|---|---|---|
| Proper booking gestational age for ANC | | |
| At 14 weeks and below | 67 | 83.8 |
| At more than 20 weeks | 2 | 2.5 |
| Not sure/don't know | 11 | 13.7 |
| How long one is supposed to take HAART | | |
| For life | 78 | 97.5 |
| During this pregnancy | 1 | 1.3 |
| Up to when I wean my baby | 1 | 1.2 |
| Drug taking reminder strategies *( multiple responses)* | | |
| Partner | 47 | 58.8 |
| Significant family relative | 18 | 22.5 |
| Alarm | 60 | 75 |
| News on radio | 7 | 8.8 |
| Meals | 1 | 1.2 |
| None | 1 | 1.2 |
| Perceived Challenges by respondents *( multiple responses)* | | |
| Lack of disclosure of HIV status | 26 | 33.3 |
| Side effects of ARVs | 17 | 21.8 |
| Stock outs of ARVs | 2 | 2.5 |
| Stigma and discrimination | 18 | 23.1 |
| Forgetfulness | 7 | 9.0 |
| None | 27 | 34.6 |

Scores for knowledge levels of HAART ranged from a possible minimum score of 0 to a possible maximum of 15. The respondents' knowledge score ranged between 5 and 15. The mean for knowledge was 10.78 and median was 11.

Table 8 shows the respondents' knowledge level scores ,one (1.2%) had a score of 5 , three (3.8%) score of 7 , nine(11.2%) score of 8 , eleven(13.8%) score of 9,twenty (25%) had a sore of 11, seven (8.8%) score of 12 , eleven(13.8%) score of 13 ,six(7 .5%) score of 14 and three (3.8%) had a score of 15.

Table 8: Scores on knowledge of HAART

N=80

| Variable – Score | Frequency | Percentage |
|---|---|---|
| 5 | 1 | 1.3 |
| 7 | 3 | 3.7 |
| 8 | 9 | 11.3 |
| 9 | 11 | 13.7 |
| 10 | 9 | 11.3 |
| 11 | 20 | 25 |
| 12 | 7 | 8.8 |
| 13 | 11 | 13.7 |
| 14 | 6 | 7.5 |
| 15 | 3 | 3.7 |

Table 9 Summarizes the respondents' levels of knowledge regarding HAART, thirteen (16.5%) had a low levels of knowledge, forty - seven (58.5%) moderate levels of knowledge and twenty (25%) demonstrated high levels of knowledge.

Table 9: Knowledge levels Scores

N=80

| HAART Knowledge level | Frequency | Percentage |
|---|---|---|
| Low knowledge (0-8) | 13 | 16.3 |
| Moderate knowledge (9-12) | 47 | 58.7 |
| High knowledge (13-15) | 20 | 25.0 |

Relationship between HAART adherence levels and knowledge levels of HAART

Table 10 below shows the result of Pearson correlation analysis which was computed to establish if there was a mutual or complimentary relationship between knowledge on HAART and HAART adherence by HIV positive pregnant women attending antenatal care clinic. The table shows a weak positive correlation (r = 0.197) of HAART adherence to HAART knowledge. This matrix is examining two variables at 5% significant level. The results showed that a weak positive significant correlation existed between levels of knowledge regarding HAART and levels of HAART adherence. Results imply that as the knowledge levels of HAART increases the HAART adherence levels also increase.

Table 10: Pearson's Correlation Matrix of HAART adherence (practice) scores and knowledge scores

| | | Y |
|---|---|---|
| | | 1.00 |
| X | | . 197 |
| *p<.05 | **p<.01 | ***p<.001 |

Y= HAART adherence levels

X= HAART knowledge level.

In summary, Pearson correlation coefficient showed a weak relationship between knowledge levels of HAART and HAART adherence levels (r=197).The result implies that as knowledge levels of HAART increased the HAART adherence levels also increased. Since the relationship was insignificant (p-value = 0.081>0.05 there was no need to proceed to regression.

# CHAPTER 5

# DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

## Introduction

This chapter discusses the study findings and their implications to nursing practice, education and research. Limitations and recommendations of the study will also be presented.

## Summary

The purpose of the study was to determine the relationship between knowledge levels of Highly Active Antiretroviral Therapy (HAART) and HAART adherence levels among Human Immuno – deficiency Virus (HIV) positive pregnant women aged 15 to 45 years attending antenatal care (ANC) at Marondera Provincial Hospital and Municipal Clinics. A descriptive correlation study design was used and a sample of 80 HIV positive pregnant women meeting the inclusion criteria participated in the study. Face to face interviews were conducted using a structured interview schedule for data collection. Pender's Health Promotion Model (2006) was used to guide the study because of its relevance to the variables under study. The study variables were knowledge levels of HAART as the (independent variable) and HAART adherence levels (dependent variable) among HIV positive pregnant women.

The study results of HAART adherence scores for the sample n = 80 ranged from 2 and 13 out of a maximum of 13. From this range 1 (1.2%) had a score of 2 and 2 (2.5%) had a score of 13. The distribution of HAART adherence levels among the HIV positive pregnant women were described as low (score of 0 – 8), moderate (score of 9 – 11) and high (score of 12 -13) HAART adherence levels. This therefore meant that among the respondents 15(18.7%) had low adherence, 51 (63.8%) moderate adherence and 14 (17.5%) had high adherence levels of at least 95%. The recommended WHO (2010) HAART adherence levels

essential for sustained suppression of viral replication necessary for reducing MTCT of HIV is at least 95%. From these statistics only 14 (17.5%) were adherent and 66 (82.5%) were non-adherent meaning that they had HAART adherence levels which were less than 95%.

The mean level of knowledge score was 10.78 and the median score was 11. The distribution of levels of knowledge on HAART among the respondents were that 13(16.5%) had low levels of knowledge and about 47 (58.5%) had moderate levels and only 20(25%) had high levels of knowledge.

The Inferential statistics of Pearson Correlation examined the two variables at 5% significant level. The results showed that a weak positive non significant correlation (r = 0.197) existed between knowledge levels of HAART and levels of HAART adherence. Results imply that as the levels of knowledge on HAART increases the levels of HAART adherence also increase.

## Discussion and Implications

### Sample Demographics

This study sample consisted of 80 respondents of HIV positive pregnant women attending ANC at Marondera Provincial Hospital and Municipal Clinics. The respondents' ages ranged between 15 and 44 years with majority of the women aged between 20 to 39years (88.8%). This age group was noted to be the most sexually active and reproductive who have an increased risk of contracting sexually transmitted infections including HIV infection, (ZDHS, 2010/2011).

The majority of the respondents were married women, 67(83.8%) of the respondents, the single women were 9 (11, 2%) while divorced or separated women were 4 (5 .0%). This shows that a high prevalence rate of HIV among the married women which could be

attributable to lack of empowerment to negotiate for safer – sex practices in suspicious infidelity. In a study, Igwegbe, Ugboaja, and Nwajiaku (2010), found out that the majority (97%) of women who participated in their study were married women. This study was performed to determine the prevalence and determinants of non – adherence to ART among HIV positive pregnant. According to Ekama et., al (2012), findings in their study revealed that marital status and having a HAART treatment reminder was associated with optimum adherence.

Among the respondents, 43 (53.8%) had attained Ordinary Level of education, while 3(3.7%) had attained Advanced Level of education. Interestingly, a high percentage of these women had attained Primary education and this has a negative influence on women empowerment. According to ZDHS (2010/2011), educational levels had a great influence on the individual's level of understanding and the subsequent practical application of the learnt knowledge concepts such as adhering to HAART schedule. Higher levels of academic education empower women to be resourceful in seeking out knowledge on health promotion. Education also enhances assimilation of health promotion. Similar sentiments were echoed by Boateng, Kwapong and Agyei-Baffour,(2013)who revealed that lower levels of education were associated with non- adherence to ART as a result of poor understanding of the benefits of HAART. Out of 80 respondents, 57 (71.3%) were unemployed while 17 (21.3%) were self-employed and 6 (7.5%) were formally employed. Having a personal source of income empowers women in their health seeking behavior. The findings of the study support demographic research findings that the majority of Zimbabwean women are not gainfully employed and depend on the benevolence of their husbands or male partners (Sibanda, 2008). This economic dependence will make women more vulnerable to HAART non-adherence due

to lack of financial support for example for transportation to attend the HAART review and supply Clinic. Furthermore increased economic empowerment of women may increase their utilization of health services as instructed by the health worker.

## HAART adherence levels

The study findings showed that the HAART adherence levels were low, 14 (17.5%) had high HAART adherence levels, 51 (63.8%) moderate HAART adherence levels and 15 (18.7%) low HAART adherence levels. WHO (2010) recommendation on HAART adherence levels states that HAART adherence levels could only be described as high or low adherence levels. High HAART adherence levels would be when at least 95% or more is achieved while anything below that is considered low adherence. This therefore means the majority of the women 66(82.5%) attained low adherence levels. These findings were contrary with the study by Nachega et.al, (2012) which revealed high HAART adherence levels in which 73. 5 % of HIV positive pregnant women had achieved optimum HAART adherence levels. In another study by Ekama et.al, findings revealed that 80.6% of the respondent in their study achieved optimum HAART adherence levels of more or equal to 95% while 19.4% were non adherent. HAART adherence levels of at least 95% or more were necessary for sustained suppression of viral replication for PMTCT while low adherence would lead to increased viral replication with increased risk of MTCT of HIV, (WHO, 2013).

In the study, HAART adherence levels were assessed using two methods of measurement namely, self – reported adherence and pill – count. Concerning self – reported HAART adherence levels, several variables were evaluated to measure the respondents' HAART adherence levels. Responding to the question of whether the respondents took their ARVs daily, all the 80 (100%) reported to have taken their ARVs on a daily basis. When asked whether they took their tablets around the same time daily, 69 (86.2%) reported to always, 9 (11.2%) sometimes and 2 (2.5%) never took their tablet on the same time daily. It is commendable that they took their treatment daily, however only 86.2% took their medicines at the same time daily and 10% admitted they had missed a dose during the month preceding the study. Not taking treatment daily and missing doses leads to suboptimal adherence levels. When asked whether they had missed a dose of ARVs in the past month, 72 (90%) had not missed a single dose while 8(10%) had missed a dose. Whether they always kept their HAART appointment review and supply clinics, 70 (93.8%) always kept their HAART review and supply appointments while 2(2.5%) sometimes and 3 (3.7%) never kept HAART appointment review clinics. In a study by Bardeguez et., al, (2008) to determine adherence to ARVs among US women during and after pregnancy, self – reporting method for the measurement of HAART adherence was also used. In this study respondents reported about the number of missed doses and if they remembered the last time when a dose had been missed, factors that respondents perceived as motivators to HAART adherence. Study findings revealed that in a sample of (n =445), 75% reported perfect adherence with self – reporting. Contrary to these findings, self reported adherence was associated with information recall bias hence research findings may have lacked validity (Igwegbe, Ugboaga, Nwajiaku, 2010).

In the study, pill count as HAART adherence level measurement revealed that 33 (41, 25%) brought their ARV tablets to the ANC clinic. Out of these, 32 (40%) had a pill count balance which corresponded with the month's supply of ARVs while one did not bring the remaining pills to the clinic. All women on HAART are encouraged to bring remaining pills to the clinic in order to verify with self – reported adherence. The remaining 47 (58.75%) did not bring their pills to the clinic. In a similar study, Ekama et.,al,(2011) also used pill count as measure of HAART adherence levels to which an adherence level of 95% was allotted when respondents took 19 out of 20 prescribed doses. In the same study self reporting adherence was also used to measure adherence. According to WHO (2013) pill counting was a recommended measure of HAART adherence levels while comparing with calendar which could be used to validate the self – reported adherence. However this method could be most unreliable as it is associated with possibility of pill dumping by the clients unless an unannounced home visit was done to get an accurate reading. The presence of HAART adherence support system was also examined. Out of 80 respondents, 60 (75%) had someone to remind them to take their ARVs. This was either a husband or sex partner 46 (57.5%), significant family relative 14 (17.5%), while 26 (32.5%) did not have. A HAART treatment supporter was found necessary considering that these medicines have to be taken for a life time. The psychological distress associated with the condition may lead to non adherence as a result of skipping some doses or taking a pill holiday. Taking ARVs for a long time would soon predispose to signs of treatment fatigue which is often observed among some patients suffering from chronic disease (Bardeguez et., al, 2008). The need for a HAART treatment support was found useful in 55.9% of HIV positive pregnant women a study in which 89 .5% had support from their husbands (Ekama et. al, 2012). This is a promising sign that husband are slowly coming in to support the PMTCT programme and by such it enhances HAART

adherence among HIV positive pregnant women. Responses to what challenges the HIV positive pregnant women were facing while taking ARVs, 52 (65%) of the respondents did not face any challenges regarding their treatment, 19 (23.8%) reported side effects, 4(5.0%) gave disclosure of one's HIV status as a challenge, 3(3.8%) cited forgetfulness and 2(2.5%) experienced stock outs of ARVs. These are barriers to attainment of optimum adherence. According to Pender's HPM (2006) perceived barriers such lack of disclosure of one's HIV status partner or significant family member impacts negatively with commitment to a health promoting behavior with subsequent failure to achieve the desired health goal. In this case women with challenges of disclosure are most likely to be non – adherent to HAART thereby increasing the risk of MTCT of HIV and the deterioration of the mother's own health. However, disclosure of one's HIV status leads to the provision of good moral support, socio – economic support and implementation of safer sex practices such as correct and consistent use of condoms to protect from new HIV infections. Of the two women who had stock outs, one had this experience after they had visited some relative and could not identify a health center to get ARV supplies while the other woman was admitted to hospital for days for stabilization of pregnancy induced hypertension, she did not carry her tablets all the time with her and she failed to negotiate with the midwife for a contingency supply of ARVs. Similarly in a study to determine the prevalence and determinants of non – adherence to ARVs among HIV positive pregnant women by Igwegbe, Ugboaja, Nwajiaku (2010), revealed that non – disclosure was associated with non – adherence due to a lack of support network.

## Knowledge levels regarding HAART

Pender's Health Promotion Model (2006) emphasised that acquisition of knowledge was an important component that influences the implementation of a health promoting behavior. Full understanding of the benefits and outcome of a health promoting action instills motivation and the desire to embark on a health promoting behavior. Understanding the benefits also assists the individual to positively identify barriers to a health promoting behavior then strategise ways of overcoming them in order to achieve the outcome of a health promoting behavior.

It is believed that when HIV positive pregnant women are given the relevant information regarding HAART they are most likely to adhere to HAART schedule (Ekama et. al, 2011). Sound knowledge on HAART was found to be associated with optimum HAART adherence (Ekama et. al, 2011).

In this study, the mean for knowledge levels regarding HAART was 10.78. Among the respondents 13 (16.5) had a low level, 47 (58.5%) moderate level and 20 (25%) had high level of knowledge. This suggests that there could be other factors besides being knowledgeable which could be influencing the practice behavior, such as attitude, cultural beliefs etc. In a study to determine patients' characteristics and attitudes associated with HAART adherence by Wenger et., al, (1999) findings revealed that beliefs that ARVs might harm the baby would lead to non- adherence.

Responses to the question whether the respondents had ever received information about ARVs, majority of the respondents 79 (98.8%) reported they had received information on ARVs while 1 (1, 2%) reported to have not been educated about the ARVs.

About the source of information, 46 (57.5%) had received health information regarding HAART from the nurses, 36 (45%) were educated by counselors and 1 (1.2%) received from significant relative. The main source of knowledge was from the nurses. The nurses provide relevant individualised counselling during ANC on the importance of taking HAART as instructed, while doing so nurses will listen attentively to questions and provide counseling on anything that may affect the woman's confidence to adhere to HAART schedule. According Pender's HPM (2006) clients need to develop self – efficacy which is a perceived feeling of that one has the ability to carry out a health promoting action.

Responses to what the respondents perceived as benefits of HAART yielded that the majority 76 (95%) thought that ARVs were taken in order to prevent MTCT of HIV, 66 (82.5%) reported improvement in the mother's quality of life health and 40 (58.8%) reported suppression of viral replication. In a similar study by Boateng, Kwapong, Agyei-Baffour, (2013) findings revealed that 88% of respondents in their study reported that HAART reduced vertical transmission of HIV infection was a major benefit of taking HAART T that was given. In the same study some quoted response from a woman were, "I know I need to prevent my baby from getting infected and this is very important to me so I make sure I come for whenever I have come for the review and supply of HAART." According to Pender's Health Promotion Model (2006), when a person clearly understands the outcome of implementing a health promoting action, they commit themselves to the health promoting behavior by doing it. In this study, the women also demonstrated that they had information relating to effects of HAART non- adherence so that 70 (87.5%) reported that risk of MTCT of HIV would be increased, 70 (91.2) perceived that deterioration of the mother's health would occur and 14 (17.5%) reported that transmission of ARV drug resistant HIV strain would occur. The

findings of a study by Wenger et al, (1999) revealed that when women had a sound understanding of ART and they perceived that taking ART improved quality of mother's health and that non- adherence caused viral resistance and treatment failure. This knowledge when applied into practice would enhance HAART adherence.

When asked what they perceived as the proper booking gestational age for antenatal care, the majority of the respondents 67(83.8%) reported at 14 weeks and below, 2 (2.5%) reported at more than 20 weeks and 11(13.8%) were not sure or did not know when. According to the WHO (20O9) standards early gestational age ANC booking below 14 weeks is recommended for early initiation of HAART to slow down viral replication and reduce the maternal plasma viral load essential for prevention of MTCT of HIV.

When asked about what could be utilised as a HAART treatment reminder, majority 60 (75%) of the respondents utilised the mobile phone alarm while 47 (58.8%) were reminded by their partner, 18 (22.5%) were reminded by the significant family relative who included their sisters, mother or their children especially for the single , divorced or separated ,7 (8.8%) reminded by the news on the radio , 1(1,2%) meal time and 1 (1.2%) did not have any. Having a HAART treatment reminder enhances adherence. The value of disclosure can never go without being emphasised as this ensured increased social and psychological support of the HIV positive partner thereby enhancing HAART adherence.

Responses about for how long HAART were supposed to be taken, the majority of the women 78 (97.5%) reported for life, 1(1.2%) stated during pregnancy and 1 (1.2%) reported up to when they weaned their baby. When HIV positive pregnant women taking HAART knew that these ARVs also improved maternal quality of health besides preventing MTCT of

HIV and were to be taken for life then they would be motivated to take HAART according schedule. Mothers would choose to take their HAART and live to look after their children. Respondents were also asked to relate what they perceived as challenges faced by pregnant women who are taking ARV and the majority 26 (33.3%) reported lack of disclosure, 18 (23.1%) cited stigma and discrimination, 17 (21.8%) reported experiencing side –effects and 7 (9.0%) reported forgetfulness. This was in agreement with Igwegbe, Ugboaja, Nwajiaku (2010) research findings that challenges that militated with HAART adherence included , forgetfulness (63,85) accounting for bigger percentage , experiencing side effect (5.0%), lack of disclosure as well was noted to negatively influence HAART adherence. This only emphasises the value of a HAART treatment partner to remind on taking their HAART and also provide psychosocial support.

Relationship of knowledge levels of HAART and HAART adherence levels

The research findings showed that there was a weak positive correlation ($r = 0.197$) of HAART adherence to HAART knowledge. This matrix examined two variables at 5% significant level. The results showed that a weak positive non significant correlation ($p$ – value $=0.081 > 0.05$) existed between knowledge levels of HAART and levels of HAART adherence. Results imply that as the levels of knowledge regarding HAART increases the HAART adherence levels also increase. This shows that there could be other factors such as attitudes, cultural beliefs and values that could be militating against optimum adherence for PMTCT. It seems knowledge alone would not completely transform the women's behavior that would facilitate achieving the desired outcome having an HIV negative infant at end of pregnancy. This implies that further research is recommended to elicit the possible reasons

and address those issues militating against compliance to education to achieve the desired HAART adherence for PMTCT.

However, findings of a study conducted by Ekama et., at, (2011) revealed that good knowledge of HIV and ART ($p = 0.001$ and having treatment supporter to enhance HAART adherence 0.002) were found to be significantly associated with achieving optimum HAART adherence levels. In this study 80.6% of the interviewed 170 women achieved HAART adherence levels of 95% and greater. This implies that HAART treatment supporter is especially important for effective adherence for PMTCT.

## Theoretical Framework

Pender's Health Promotion Model (2006) was utilized to guide the conceptualization and analysis of this study. Pender's three major categories used in the study included individual characteristics, behavior specific cognitions and affect and behavior outcome. The individual characteristics considered were age, marital status, level of education, employment status and family total income. These concepts affect perception of the behavior specific cognitions which include perceived benefits of action, perceived barriers to action, perceived self – efficacy and activity related affect. Behavioral outcome involves commitment to action in this case being able to take ARVs daily and on same time, not missing a single dose of HAART and regularly attending HAART review and supply clinics.

The hypothesis tested was knowledge of HAART influenced a health promoting behavior of adhering to HAART treatment schedule in order to achieve a positive outcome of an HIV free infant at end of pregnancy. The findings of the study revealed that 13 (16.5%) had a low knowledge levels, 47 (58.5%) moderate levels and only 20 (25%) had high levels of

knowledge on HAART and HAART adherence levels in which 16 (17, 5%) of the respondents attained at least 95% HAART adherence levels meaning that 82.5% had a low adherence of less than 95%. Findings clearly indicated that there is increased risk of MTCT of HIV which is militating against the desired goal of the treatment.

The statistical findings of the study revealed that there was a relationship between knowledge levels of HAART and HAART adherence levels although the relationship appears to be a weak correlation r=197.

## Implications to Maternal Child Health and Nursing Practice

The findings of this study indicated that only 25% of the respondents had high levels of knowledge of HAART and only 17.5% had high levels of adherence hence one can safely infer that the moderate to low levels of knowledge in the majority of the respondents 75% could have a bearing on low adherence among the 82.5% of the respondents with suboptimal adherence practices. Findings of the study demonstrate suboptimal adherence practices as evidenced by the fact that 36.2% booked after the recommended 14 weeks gestation, 13% never took their pills at the same time daily, 10% did not know what to do when they missed a dose of HAART.

Implications to midwifery practice are that these are the learning needs of HIV positive mothers that need addressing through health education. The major challenges facing respondents on HAART were issues regarding disclosure for 33.3% and stigma and discrimination 23.1%. This points to need for midwives to address these important psychosocial barriers to optimum adherence by not only harnessing male participation in PMTCT issues but also through community involvement. Knowledge levels on HAART was moderate for 58.7% and low 16.3% as evidenced by the fact that when asked what to do if they missed a dose 58.8% admitted they would not know what to do. When asked about

effects of non- adherence only 17.5% cited transmission of drug resistant HIV strain. This also points to need to strengthen health education that would improve adherence and practice.

## Implications to Nursing Research

Findings of the study reveal a weak correlation (r=0.197) of HAART adherence to knowledge. This implies that there are other factors besides knowledge regarding HAART that influence adherence practices. Therefore there is need for further research in order to establish the other factors. It would also be important to explore the influence of attitudes and cultural values in HAART adherence.

## Recommendations

1. Midwives should strengthen their partnership with HIV positive pregnant women on HAART so that they would be able to explore each individual woman HAART adherence levels and provide counselling that would assist in dealing with possible HAART adherence barriers.
2. Conduct further studies to investigate the impact of attitudes and cultural beliefs regarding PMTCT and HAART adherence
3. Conduct studies to investigate issues of non- disclosure, stigma and discrimination on HAART adherence.
4. Midwives should strengthen counseling of HIV positive pregnant women on the importance of carrying their ARVs with wherever they would go to avoid missing doses and to the clinic for the verification of self – reported adherence.
5. In – service training for midwives in the maternity department in order to regularly equip them with adherence counseling skills in order to ensure that pregnant women understand the importance of HAART adherence.

6. There would be need to conduct a similar study in same setting in another province to assess the situation of HAART adherence levels on larger samples probably it would help identify possible challenges that could be in PMTCT programme.

Limitations

1. The study was conducted on 80 HIV positive pregnant women attending ANC at Marondera Provincial and Municipal Clinics for which results are not a true reflection of levels of knowledge regarding HAART and HAART adherence levels around the country hence study findings cannot be generalised to other populations except Marondera population.
2. The sample size (80) was small and this reduces generalisability of the findings to the entire population.
3. A structured interview with closed ended questions used to obtain self – reported adherence from the women limited the responses, the inclusion of few open ended questions would assist to obtain in depth information in appropriate areas.
4. More accurate results on HAART adherence could be obtained if study could be conducted in a familiar setting for the clients such as in their homes and where possible through making unannounced visits because the investigator would be able to pick on the reality on the ground because there would be reduced chances of pill dumbing.
5. The instrument was developed by the investigator and used for the first time in the study. A pre-test of the instrument was conducted to evaluate the instrument's internal validity and necessary corrections were made. Further testing and refinement may be required.

## Summary

The purpose of the study was to determine the relationship between knowledge levels of Highly Active Antiretroviral Therapy (HAART) and HAART adherence levels among Human Immuno – deficiency Virus (HIV) positive pregnant women aged 15 to 45 years attending antenatal care (ANC) at Marondera Provincial Hospital and Municipal Clinics.

Pender's Health Promotion Model (2006) was utilized to guide the conceptualization and analysis of study because of its relevance to the variables under study. The variables studied were levels of knowledge on HAART (independent variable) and HAART adherence levels (dependent variable).

A descriptive correlation study design was used. A sample size of 80 HIV positive pregnant women attending antenatal care was selected to participate in study. Systematic sampling method was used or selection of respondents who met the inclusion criteria.

The structured interview schedule comprising of three sections was used for data collection, Section A was for collection of the demographic information, Section B was for dependent variable – HAART adherence levels and Section C was for the independent variable – levels of knowledge regarding HAART. A pilot study was conducted to test and refine the study instrument prior to collection of data.

The study findings revealed that only 14 (17, 5%) out of 80 respondents had a high adherence while 66 (82.5%) had low HAART adherence levels. Out of 80, 13 (16.5%) had low knowledge levels, 47 (58.75%) had moderate knowledge levels and only 20 (25%) had high knowledge levels.

The Pearson correlation showed weak positive correlation (r = 0.197) of HAART adherence to HAART knowledge. This matrix is examining two variables at 5% significant level. The results showed that a weak positive non significant correlation (p- value =0.081

>0.05) existed between levels of knowledge regarding HAART and levels of HAART adherence. Results imply that as the levels of knowledge regarding HAART increases the HAART adherence levels also increases.

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APPENDIX A

SUBJECT INFORMED CONSENT

Protocol title:

A study to establish the relationship between knowledge levels of Highly Active Antiretroviral Therapy (HAART) and HAART adherence levels among HIV positive pregnant women aged 15 to 49 years taking HAART and are attending antenatal care at Marondera Provincial Hospital, Dombotombo and Nyameni Municipal clinics Family Child health Departments

Name of researcher: Mrs. Helen Nyamutsamba

Phone: 0772802704

Project description: This study is being conducted in order to examine the relationship between knowledge levels of HAART and HAART adherence levels among HIV positive pregnant women aged 15 to 49 years antenatal care at Marondera Provincial Hospital and Municipal Family Child Health departments.

It is hoped that the findings of the study will reveal the levels of HAART adherence and the levels of knowledge regarding HAART among HIV positive pregnant women who are taking HAART.

Findings and recommendations could be incorporated in health education programmes aimed at strengthening the importance of adherence to HAART so that MTCT of HIV can be reduced.

Your rights

Before you decide whether or not to volunteer for this study, you must understand its purpose, how it may help you, the risks to you, and what is expected of you. This process is called informed consent.

Purpose of research study

The study is conducted as a requirement in Partial Fulfillment of Master of Science Degree in Nursing Science by the University of Zimbabwe

Procedures involved in the study

You have been selected to participate in this study because you are pregnant and you are taking HAART and also that you are attending antenatal care at this health institution. If you are agreeable you will be one of 80 respondents who will be interviewed.

If you decide to participate in this study a face to face interview using a structured interview schedule will be conducted for 20 minutes.

You may indicate your willingness to participate in this study by signing this consent.

Discomforts and risks

No significant side effects to you or to your unborn infant are anticipated in the study as nothing shall be introduced in your body, no experiments are to be conducted in this study. However, should you experience any psychological distress during the interview process; you will be counseled before leaving this institution. Also you will be delayed from going home by 20 minutes.

Potential benefits

There are no benefits in the form of cash or in kind for participating in the study; your participation in this study is voluntary. However, I believe that the findings of the study will be utilised to improve the management of HIV positive pregnant women who are taking Highly Active Antiretroviral Therapy (HAART) so that they achieve the most favourable adherence levels that will assist in Prevention of Mother to Child Transmission of HIV infection.

Study withdrawal

You may choose not to enter the study or withdraw from the study at any time without loss of benefits entitled to you. Your refusal to participate will not affect the way you are treated at this health institution.

Confidentiality of records

If you indicate your willingness to participate in this study by signing this consent, I would like to promise you that all information that shall be obtained shall be kept in confidence; but may be shared with those directly involved in this study such as my supervisor. Codes in the form of numbers will be used to ensure anonymity since no name will appear anywhere on the interview schedule.

Problems/questions

Please ask questions about this research or consent now. If you have any question in future please ask, my contact number is 0772802704

Authorization

I have read this paper about the study or it was read to me. I understand the possible risks and benefits of this study. I know being in this study is voluntary. I choose to be in this study: I know I can stop being in the study and I will not lose any benefits entitled to me. I will get a copy of this consent form. (Initial all the previous pages of the consent form)

_____

Client Signature Date

_____

Client Name (Printed)

_____

Researcher Signature Date

_____

Witness Signature Date

APPENDIX B

INSTRUMENT

SECTION A

SOCIO – DEMOGRAPHIC CHARACTERISTICS

1. How old are you? ☐

2. What is your marital status?

   1=Single 2=Married

   3=Divorced 4=Widowed

3. What is your level of education?

   1=Primary level 2=ZJC

   3='O' level 4='A' level

4. What is your employment status?

   1=Unemployed 2=Self employed

   3=Formally Employed

5. What is your total family monthly income?

   1=Below $150 2=$151-$200

   3=$201-$300 4=$301-$400

   5=$401-$500 6=Above $500

SECTION B

Dependent variable – HAART Adherence

The following questions seek to find out how you are taking your anti-retroviral therapy.

1. At what gestational age did you book for ante-natal care?

| | |
|---|---|
| 1=At 14 weeks and below | ☐ 2 |
| 2=At 14 weeks plus 1 day to 20 weeks | ☐ 1 |
| 3=At more than 20 weeks | ☐ 0 |

2. Do you take your tablets everyday?

| | |
|---|---|
| 1=Always | ☐ 1 |
| 2=Sometimes | ☐ 0 |

3. In the past month, have you missed a single dose of your anti-retroviral therapy?

| | |
|---|---|
| 1=No | ☐ 1 |
| 2=Yes | ☐ 0 |

4. Do you take your tablets around the same time daily?

| | |
|---|---|
| 1=Always | ☐ 2 |
| 2=Sometimes | ☐ 1 |
| 3=Never | ☐ 0 |

5. Do you have someone to remind you to take your tablets?

| | |
|---|---|
| 1=Husband/Sex partner | ☐ 1 |
| 2=Significant family relative | ☐ 1 |
| 3=Do not have | ☐ 0 |

6. Do you keep your HAART appointments review dates?

| | | |
|---|---|---|
| 1=Always | ☐ | 2 |
| 2=Sometimes | ☐ | 1 |
| 3=Never | ☐ | 0 |

7. What do you do, when you forget to take your tablets?

| | | |
|---|---|---|
| 1=Never forgotten | ☐ | 2 |
| 2=Correct | ☐ | 1 |
| 3=Incorrect | ☐ | 0 |

8. What are the challenges that you are facing in taking you are facing in taking your ARV medicines in the recommended manner?

| | |
|---|---|
| 1=Lack of disclosure | ☐ |
| 2=Side effects of the medication | ☐ |
| 3=Stock outs of ARVs | ☐ |
| 4=Stigma and discrimination | ☐ |
| 5=Forgetfulness | ☐ |
| 6=None | ☐ |

8a. Please may I count your pills that are left from those that you are taking?

| | | |
|---|---|---|
| 1= Correct | ☐ | 1 |
| 2= Incorrect | ☐ | 0 |
| 3= Not available | ☐ | 0 |

Section C

Independent variable: Knowledge regarding HAART

*The following questions will seek to find out how much information you have on HAART.*

9. Did you ever receive health education on Anti retroviral therapy?

| | | |
|---|---|---|
| 1=Yes | ☐ | 1 |
| 2=No | ☐ | 0 |

10. What was the source of information?

| | |
|---|---|
| 1=Nurses | ☐ |
| 2=Doctors | ☐ |
| 3=Counselors | ☐ |
| 4=Print media | ☐ |
| 5=Electronic media | ☐ |
| 6=Significant family relative | ☐ |

11. What do you think are the benefits of taking HAART?

| | | |
|---|---|---|
| 1=Suppression of viral replication | ☐ | 1 |
| 2=Prevention of mother to child transmission | ☐ | 1 |
| 3=Improvement in mother's quality of health | ☐ | 1 |

12. What are effects of HAART non adherence?

| | | |
|---|---|---|
| 1=Mother to child transmission of HIV | ☐ | 2 |
| 2=Transmission of drug resistant HIV strain | ☐ | 1 |
| 3=Deterioration of mother's health | ☐ | 1 |

13. What is the proper booking gestational age for ANC?

| | | |
|---|---|---|
| 1=At 14 weeks and below | ☐ | 2 |
| 2=At 14 weeks plus 1 day to 20 weeks | ☐ | 1 |
| 3=At more than 20 weeks | ☐ | 0 |
| 4= Not sure /don't know | ☐ | 0 |

14. What strategies can one use to remind yourself to take your drugs on time? Reminded by:

| | |
|---|---|
| 1=Partner | ☐ |
| 2=Significant family relative | ☐ |
| 3=Alarm | ☐ |
| 4=News on radio | ☐ |
| 5=Crowing of the cork | ☐ |
| 6=Other…… | |

15. For how long are you supposed to take your HAART?

| | | |
|---|---|---|
| 1=For life | ☐ | 1 |
| 2=During this pregnancy | ☐ | 0 |
| 3=Up to when I wean my baby | ☐ | 0 |

16. What should one do if they missed a dose?

| | | |
|---|---|---|
| 1=If less than half the time to the next dose – I take that dose as soon as I remember | ☐ | 1 |
| 2=If more than half the time, to the next dose, I skip the missed dose | ☐ | 1 |
| 3=I do not take double dose next time | ☐ | 1 |
| 4=I am not sure of what to do | ☐ | |

17. What should one do if they experience side effects?

| | | |
|---|---|---|
| 1=Continue taking ARVs and report to health centre | ☐ | 1 |
| 2=Continue taking ARVs and consult significant others | ☐ | 0 |
| 3=Stop taking ARVs immediately | ☐ | 0 |

18. In your own perception, what challenges are being faced by pregnant women who are HIV positive and are taking ARVs?

| | |
|---|---|
| 1=Lack of disclosure | ☐ |
| 2=ARVs side effects | ☐ |
| 3=ARVs stock outs | ☐ |
| 4=Stigma and discrimination | ☐ |
| 5=Forgetfulness | ☐ |
| 6=None | ☐ |

Thank you for participating!!!!

# APPENDIX C

## Gwaro rebvumirano

Musoro wetsvagiridzo: -

Wongororo yekutsvaka ukama pakati peruzivo rwemishonga inodziwirira kutapurira kwehutachiona hwehiv nemanwiro emishonga iyi sezvinotarisirwa pakati pemadzimai wakazvitakura wari kumwa mishonga iyi,vane makore ekuberekwa ari pakati pemakore gumi nemashanu nemakumi mana ane mapfumbamamwe , wakanyoresa kutariswa pamuviri pachipatara chemarondera nekumakiriniki ekanzuru yemarondera ,dombotombo nenyameni.

Zita remuongorori**:** - Nyamutsamba Helen

Runhare:-0772802704

Tsananguro yeongororo:-Madzimai achabvunzwa achasarudzwa kubva kumadzimai akazvitakura ane makore ekuberekwa ari pakati pemakore gumi nemashanu nemakumi mana nemapfumbamwe, uye aine utachiona hwe HIV vari kumwa mishonga inoderedza kutapurira kweutachiona kubva kuna amai huchienda kumwana. Madzimai aya akanyoresa kutariswa pamuviri pachipatara cheMarondera nekumakiriniki ekanzuru reguta reMarondera, Dombotombo neNyameni .

Kodzero dzenyu**:** - Musati masarudza kuti munoda here kana kuti hamudi kupinda muwongororo iyi, munofanira kunzwisisa chinangwa chewongororo, zvainokubatsirai, njodzi dzingakuwirai uye zvamunotarisirwa. Iyi imvumo yamunoita manzwisisa nezvewongororo iyi.

Chinangwa cheongororo: - Wongororo iyi inodiwa kuti ndipedze zvidzidzo zvangu zveMasters of Science degree reNursing Science kuchikoro chedzidzo yepamusoro ye kuUniversity ye Zimbabwe.

Zvamunotarisirwa**:** -Ndinodawo kukuzivisa kuti masarudzwa kupinda muwongororo iyi ngekuti muri umwe wemamwe madzimai ane hutachiona hweHIV anepamuviri uye ari kunwa mishonga inoderedza mukana wekutapurirwa kwehutachiona uhu kumwana uye kuti makore enyu ari pakati pegumi nemashanu nemakumi mana nepfumbamwe , uye kuti muri kutariswa pamuviri penyu pakiriniki/ chipatara chinoichi. Munotarisirwa kupindura mibvunzo iyo ndichakubvunzai munguva inogona kukutorerai maminitsi makumi maviri.

Njodzi dzingakuwirai: - Hapana zvakaipa zvakanyanya zvandinotarisira kuti zvingakuwirei sezvo ndisingapindire mumarapirwo enyu. Asi dzimwe nguva munogona kushungurudzika mupfungwa munguwa yekubvunza nekupindura mibvunzo, ndinozokubatsirai kuti muwane mukana wekukurukura nezvedambudziko renyu nanamazvikokota ezvazvo ,vanachipangamazano kuti murerukirwe musati maenda kumba .

Zvingakubatsirai: - .Ndinodaira kuti zvichawanikwa mutswagiridzo iyi zvichabatsira mukudzidzisa zvakakoshera kuchengeta nguva dzekumwa mishonga inodzivirira kutapukira kwehutachiona hweHIV kubva kuna amai huchiyenda kumwana.Chinangwa chiri chekuti vanaamai vaneutachina hweHIV wakwanisewo kubereka vana wasina hutachiona hweHIV.

Kubuda muongororo: - Hamumanikidzwi kuramba muri muongororo iyi, zvichireva kuti munokwanisa kubuda muchirongwa chino pamunenge muchidira pasina kuvhundutsirwa kana kurasikirwa nekodzero yenyu yekurapwa pachipatara kana kiriniki inoyi .

Kudzivirira kuzivikanwa kwenyu: - Masarudzwa kuve mumwe weavo wachabvunzwa muwongororo iyi ngekuti makazvitakura uyewo kuti murikutora mishonga yema ARV , uye kuti makanyoresa pamuviri penyu pachipara /kiriniki ino iyi . Kuti mawirirana nazvo , muchawa mumwe wemakumi masere wandichabvunza. Kana mabvuma kupinda muwongororo iyi , munokumbirwa kuisa runyoro rwenyu pagwaro rechibvumirano ichi.Ndinokuvimbisai kuti , mashoko ose achakurukurwa mutsagiridzo iyi achachengetedzwa

zvawanzika ,asi anogona kugoveranwa nemudzidzi wangu. Zita renyu hapana parinonyorwa pane bepa ripizvaro , asi kuti manhamba ndiwo achashandiswa

Mibvunzo: - Kana muine zvamunoda kubvunza kwandiri ,ivai makasununguka kubvunza **.**

Chibvumirano

Ndaverenga gwaro iri ndikanzwisisa zvese zvanotarisirwa kwandiri. Ndinobvuma kuti ndazvisarudzira kupinda mutsvagiridzo iyi, handina kumanikidzwa. Ndinotambirazve kuti ndinogona kubuda muwongororo iyi pandinege ndadira.

Ari kubvunzwa (participant) Muongorori (researcher)

Name and Signature ……... Nyamutsamba Helen

Date…….…… Signature ……

Appendix D

MIBVUNZO

CHIKAMU CHEKUTANGA

Hupenyu nemagariro enyu

1. Mune makore mangani? ☐

2. Makaroorwa here?

   1 =Handina kuwanikwa  2=Ndakawanikwa

   3=Takasiyana  4=Ndakafirwa

3. Makadzidza kusvika papi?

   1=Rugwaro rwechinomwe  2=Fomu yechipiri

   3=Fomu yechina  4=Fomu yechitanhatu

4. Munoshanda here?

   1=Handishande  2=Ndinoita mabasa emaoko

   3=Ndinoshanda pakambani

5. Semhuri munowana marii pamwedzi?

   1=Pasi pe$150  2=$151-$200

   3=$201-$300  4=$301-$400

   5=$401-$500  6=Pamusoro pe$500

CHIKAMU CHEPIRI

Kuchengeta nguva yekumwa mishonga inodzivirira kutapurirwa kwehutachiona hweHIV kubva kuna amai huchienda kumwana

Mibvunzo inotevera inoda kuti tinzwisise manwiro amunoita mishonga yenyu yemaARVs

1. Makanyoresa pamuviri penyu mushure memwedzi mingani mabata pamuviri?

1=Mushure memasvondo gumi nemana zvichidzika ☐ 2

2=Pamasvondo gumi nemana nezuva rimwe chete kusvika kumasvondo makumi maviri ☐ 1

3=Papfuura masvondo makumi maviri ☐ 0

2. Munonwa mapiritsi enyu mazuva ose here?

1=Nguva dzose ☐ 1

2=Dzimwe nguva ☐ 0

3. Mumwedzi wapfuura, pane pamakambodarika kunwa mapiritsi enyu here?

1=Kwete ☐ 1

2=Hongu ☐ 0

4. Munonwa mapiritsi enyu panguva imwe chete here mazuva ose?

1=Nguva dzose ☐ 2

2=Dzimwe nguva ☐ 1

3=Ndinongosiyanisa nguva ☐ 0

5. Mune anokuyeuchidzai kunwa mapiritsi enyu here?

| | | |
|---|---|---|
| 1=Murume wangu/wandinosangana naye pabonde | ☐ | 1 |
| 2=Mumwe wehama dzangu | ☐ | 1 |
| 3=Handina anondiyeuchidza | ☐ | 0 |

6. Munochengetedza mazuva enyu ekutora mishonga kuchipatara here?

| | | |
|---|---|---|
| 1=Nguva dzose | ☐ | 2 |
| 2=Dzimwe nguva | ☐ | 1 |
| 3=Handichengetedze | ☐ | 0 |

7. Pamakambokanganwa kunwa mapiritsi enyu makaita sei?

| | | |
|---|---|---|
| 1=Handina kumbokanganwa | ☐ | 2 |
| 2=Magona | ☐ | 1 |
| 3=Matadza | ☐ | 0 |

8. Ndezvipi zvinetswa zvamuri kusangana nazvo pakunwa mapiritsi enyu zvakanaka?

| | |
|---|---|
| 1=Kusabuda pachena nokuda kwehutachiwana hwandinahwo hweHIV | ☐ |
| 2=Kusawirirana nemapiritsi andinenge ndichinwa | ☐ |
| 3=Kushaikwa kwemapiritsi emaARVs | ☐ |
| 4=Kunyara kupatsanurwa pakati pevamwe | ☐ |
| 5=kukanganwa | ☐ |
| 6= Hapana | ☐ |

8a .Ndinokumbira kuverenga mapiritsi enyu asara pane amuri kunwa

| | | |
|---|---|---|
| 1= Magona | ☐ | 1 |
| 2= Matadza | ☐ | 0 |
| 3= Handina kuuya nawo | ☐ | 0 |

CHIKAMU CHECHITATU

Ruzivo rwenyu maererano nemishonga inodzivirira kutapurirwa kweutachiona hweHIV kubva kuna amai huchienda kumwana

*Mibvunzo inotevera inoda kuti tinzwisise ruzivo rwamuinarwo pamusoro pemishonga inodzivirira kutapurirwa kwehutachiona hweHIV kumwana huchibva kuanamai*

9. Makambowana dzidziso here maererano nemanwiro amunofanirwa kuita mishonga yenyu yeARV?

| | | |
|---|---|---|
| 1=Hongu | ☐ | 1 |
| 2=Kwete | ☐ | 0 |

10. Ndiani akakupai dzidziso iyoyo?

| | |
|---|---|
| 1=Vanamukoti | ☐ |
| 2=Vanachiremba | ☐ |
| 3=Vana chipangamazano | ☐ |
| 4=Mapepanhau | ☐ |
| 5=Electronic media | ☐ |
| 6=Mumwe wehama dzangu | ☐ |

11. Zvinokubatsirai sei kuva pachirongwa chekunwa mapiritsi emaARV?

| | | |
|---|---|---|
| 1=Zvinoderedza hutachiwana mumuviri | ☐ | 1 |
| 2=Zvinodzivirira kutapurira kwehutachiwana kubva kuna amai huchiuya kumwana | ☐ | 1 |
| 3= Zvinosimudzira utano hwaamai | ☐ | 1 |

12. Chii chinoitika kana munhu akasanwa mishonga yake yemaARV sezvinotarisirwa?

1=Kutapurira kwehutachiwana kubva kuna amai huchiuya kumwana ☐ 1

2=Kutapurirwa kwehutachiwana hweHIV husingadaire mishonga ☐ 1

3=Kudzikira kwehutano hwamai ☐ 1

13. Ndeipi nguva chaiyo inotarisirwa kuti munhu auye kuzonyoresa pamuviri?

1=Pamasvondo gumi nemana zvichidzika ☐ 2

2=Pamasvondo gumi nemana nezuva rimwe chete kusvika kumasvondo makumi maviri ☐ 1

3=Papfuura masvondo makumi maviri ☐ 0

4=Handizivi ☐ 0

14. Zvii zvamungashandise kubatsira kukuyeuchidzai kunwa mishonga yanyu nenguva?

1=Murume wangu/ wandinosangana naye pabonde ☐

2=Mumwe wehama yangu ☐

3=Ndinoseta alarm ☐

4=Nhau dzepawairosi ☐

5=Kukukuridza kwejongwe ☐

6=Zvimwewo ……

15. Munofanirwa kunge muchinwa mishonga yenyu yemaARV kwenguva kusvikira riini ?

1=Kwehupenyu hwese ☐

2=Panguva yandinenge ndakazvitakura ☐

3= Kusvikira pandinorumurira mwana wangu ☐

16. Chii chamungaite kana muchinge madarika kunwa mishonga yenyu?

1=Kana nguva dzichiri pasi pechikamu chepakati nepati penguva yandinotora mishonga kechipiri pazuva iroro , ndinobva ndangonwa ipapo ☐ 1

2=Kana nguva dzadarika chikamu chepakati nepakati penguva yandinotora mishonga kechipiri pazuva iroro , ndinobva ndarenga kumwa mushonga iwoyo ☐ 1

3=Handizonwe mapiritsi kaviri panguva inotevera ☐ 1

4= Handizive kuti ndoita sei ☐ 0

17. Mungaite sei kana maita dambudziko rekutadza kuwirirana nemishonga?

1=Ndinoramba ndichinwa mushonga ndodzokera kuchipatara ☐ 1

2=Ndoramba ndichinwa mushonga ndobvunzawo mazano kune dzimwe hama ☐ 0

3=Ndobva ndamira kunwa mishonga ipapo ☐ 0

18. Ndezvipi zvinetswa zvingatadzisa madzimai akazvitakura ari pachirongwa chekunwa mishonga yemaARV nenzira inotarisirwa

1=Kusabuda pachena nokuda kwehutachiwana hwandinahwo hweHIV ☐

2=Kusawirirana nemapiritsi andinenge ndichinwa ☐

3=Kushaikwa kwemapiritsi emaARV ☐

4=Kunyara kupatsanurwa pakati pevamwe ☐

5=Kukanganwa ☐

6=Hapana ☐

Ndatenda nokudaira kwenyu mibvunzo!!!!