ADHERENCE TO ANTIRETROVIRAL THERAPY AMONG HIV-INFECTED UNDERFIVE CHILDREN ATTENDING AT MUNICIPAL HOSPITALS IN DAR - ES - SALAAM, TANZANIA

Odilia Njau

Masters of Public Health Dissertation
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By

Odilia C. Njau

A Dissertation Submitted in (Partial) Fulfillment of the Requirements for the Degree of Master of Public Health of
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CERTIFICATION

The undersigned certify that, she has read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation titled: A*dherence to Antiretroviral therapy among HIV- infected under five children attending at Municipal Hospitals in Dar-es-salaam, Tanzania,* in (partial) fulfillment of the requirements for the degree of master in Public Health of the Muhimbili University of Health and Allied Sciences.

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Dr. Rose N. M. Mpembeni (PhD)

(Supervisor)

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Date

DECLARATION
AND
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I, **Odilia C. Njau** declare that, this **dissertation** is my own original work and that it has not been presented to any other university for a similar or any other degree award.

Signature..   Date..

ACKNOWLEGMENT

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I would like also to extend my gratitude to my husband and family for financial support and unlimited moral support, encouragement and conducive environment during conducting and writing of this dissertation. Finally, my appreciation goes to the research assistants for their commitment and perfection during data collection

DEDICATION

I dedicate this work to my family Mr. and Mrs. Njau, my husband Dr. Peter Kisenge and to my children Richardson and Rayannah for their tireless support and encouragement during proposal and report writing.

ABSTRACT

Background: To reduce AIDS related mortality in children, adherence to antiretroviral treatment (ART) is critical. However, little is known about factors associated with ART adherence among children in Tanzania. The objective of this study therefore, was to assess the ART adherence among HIV infected under-fives in Dar es Salaam and identify factors associated with their adherence to ART.

Methods: This was a cross sectional study conducted in three municipal hospitals of Mwananyamala, Amana and Temeke in Dar es Salaam region. A systematic random sampling method was used to select the caretakers/children from the daily appointment list obtained from the clinic until the sample size was reached. Caretakers were interviewed using a structured questionnaire. Data was entered into the computer using excel sheet and then analyzed using SPSS statistical software. Descriptive, bivariate analysis and multiple Logistic regression analyses were performed.

Results: The study population comprised of HIV positive under-five children attending the three Municipal Hospitals. Out of the 172 under-five sampled, 77 (44.8%) were males. This study found that only a small proportion (35%) of children had an optimal ART adherence in the one month preceding the study. Majority of caretakers, 121 (70.4%) had adequate knowledge on HIV and adherence issues. Caretakers who were housewives were four-fold more likely to adhere (OR, 4.89, 95% CI, 2.08, 11.51) compared with children from caretakers who were businessmen or women. Receiving care from Amana municipal hospital and Mwananyamala municipal hospital was associated with lower rates of adherence compared to those from Temeke municipal hospital.

Conclusions and recommendation: While the levels of ART adherence among under-five children in the three municipal hospitals were low, it was found that under-fives from the caretakers who were housewives had a significantly higher adherence rates compared to caretakers who were businessmen/women. Special interventions targeting caretakers who spend more time outside home are needed to increase adherence on ART for the under-fives.

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LIST OF ABBREVIATIONS

AIDS   Acquired Immuno-Deficiency Syndrome

ARV   Antiretroviral (medications)

ART   Antiretroviral Therapy

cART   Combine Antiretroviral Therapy

CTC   Care and Treatment Clinic

DOT   Directly Observed Therapy

EMTCT   Elimination of Mother to Child Transmission

HAART   Highly Active Antiretroviral Therapy

HIV   Human Immunodeficiency Virus

KCMC   Kilimanjaro Christian Medical Centre

MUHAS   Muhimbili University of Health and Allied Sciences

PI   Principal Investigator

PMTCT   Prevention of Mother-to-Child Transmission of HIV

RA   Research Assistance

SDG   Sustainable Development Goals

SPSS   Statistical Package for Social Sciences

UNAIDS   Joint United Nations Program on HIV and AIDS

WHO   World Health Organization

DEFINITION OF TERMS

Adherence to Antiretroviral Therapy

- Adherence is compliance to medication (ARVs) regime, it is the extent to which patient take medication as prescribed by their care providers (Lars, 2005)

- Optimal Adherence to antiretroviral therapy (ART) refer to taking more than 95% of prescribe dose of ARV (WHO, 2013).

Caretaker

- A person who live with a child and participates in the child's daily care and takes the responsibility in giving the child medication and bring the child to clinic.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background information

HIV has been one of the devastating health problems in most of the developing countries since when it was found in 1981. In 2015, 36.7 million people were infected and living with HIV Worldwide while the East and Southern African Countries accounted for 46% of the global HIV population and 150,000 of them were children under fifteen years of age. Sub-Saharan Africa is the most affected region with a prevalence burden of about 70% of the total global HIV (UNAIDS 2016).

Children living with HIV continue to experience persistent treatment gaps. In 2012, 647 000 children under 15 years of age were receiving antiretroviral treatment globally. HIV treatment coverage for children was 34% (31-39%) in 2012. Although the number of children receiving antiretroviral therapy in 2012 increased by 14% in comparison to 2011, the pace of scale-up was substantially lower. In developing countries, only three in 10 children received HIV treatment in 2012. Failure to expand access to early infant diagnosis was reported as an important reason explaining the low coverage of HIV treatment in children at less than 5% in the developing Countries (UNAIDS, 2013).

UNAIDS has now set a firm course to end the AIDS epidemic by 2030 as part of the new Sustainable Development Goals. To achieve this UNAIDS has developed a fast-track approach to reach a set of time-bound targets by 2020. The targets include reducing new HIV infections by 75%, ensuring 90% of all people living with HIV know their HIV status, 90% of people who know their status have access to treatment and 90% of people on treatment have suppressed viral loads, keeping them healthy and reducing the risk of transmission. The response to HIV spans into many of the 17 Sustainable Development Goals and is mainly included under Sustainable Goal 3, to ensure healthy lives and promote well-being for all at all ages (UNAIDS, 2015). This international framework has the potential to save millions of lives and to achieve fairer and more just outcomes for people everywhere.

Over I.4 million people are estimated to be living with HIV and AIDS in Tanzania, children below 14 years constitute 11.4% (Mepham et al, 2011). In 2002, prevalence of HIV among children admitted at Muhimbili National hospital, in Dar es Salaam was 19.2% and mortality attributed to HIV illness were 21.4% (Duff et all, 2010). However, the antiretroviral therapy introduced worldwide during the late 90's has resulted in a decrease in mortality and morbidity due to HIV and AIDS, but its efficacy being dependent on the high levels of adherence.

Tanzania started providing antiretroviral therapy since early 2004. Care and treatment centers (CTC) are responsible for management of HIV/AIDS patient under the coordination of the National care and treatment program. Services provided at CTC include antiretroviral therapy to eligible patients, counseling on adherence to ARV, treatment of opportunistic infection, nutrition counseling and growth monitoring as well as monitoring and evaluation. In 2007, Tanzania was one of the countries with the largest number of children on ARV (11.5%) in East and Central Africa (MDH, 2007). ART is lifelong therapy and requires stringent adherence to treatment. Antiretroviral therapy with at least three drugs is recommended for treatment of HIV- infected children to preserve and improve immune function.

Among those on ART, retention as well as adherence to therapy remains to be major obstacles for the successful treatment of HIV-infected people. Adherence to ART is the key to achieving optimal therapeutic effects. Therefore, this study aimed to assess ART adherence and identify factors associated with adherence among HIV positive under-five children who are receiving care from municipal hospitals of Dar es Salaam.

1.2 Statement of the Problem

HIV/AIDS is still a serious health problem and a leading cause of mortality and morbidity among children in Tanzania (URT, 2010). Mortality rate due to HIV/AIDS in Tanzanian children below five years was reported to be 16% (TDHS, 2002). Adherence to ART is the only effective way to reduce mortality due to HIV/AIDS

Some studies have shown that adherence to antiretroviral drug in children and adolescents is still a problem due to multiple factors which include high pill burden, poor palatability, side effects, long term toxicity, forgetfulness and caretaker factors (Biadgilign et al, 2008). There is limited evidence on pediatric adherence to antiretroviral therapy particularly in Tanzania. This has impacted on the government efforts to address the consequences of non-adherence to antiretroviral drugs including increase in disease progression, ARV drugs resistance, risk of transmitting resistant viruses and limitation of future treatments options. This study therefore was proposed to assess the levels of adherence and factors associated with it among children receiving ART in the three municipal hospitals of Mwananyamala, Amana, and Temeke.

1.3 Conceptual Framework

This framework describes how adherence to ART among HIV+ under five children can possibly be influenced by both the under-fives' factors and the caretaker's related factors as shown in Figure 1 below. Adherence to ART can depend on determinant factors related to sex of the child and his/her age. In addition, caretaker factors may be important in influencing under-fives' adherence to ART. These factors include education, general knowledge on ART adherence, Sex, Age, occupation, social-economic status, distance to health facilities and biological relationship. Furthermore, even though all the prior factors may be available, yet facility factors are also crucial in ensuring that adherence to ART is achieved. Facility factors includes availability of ART, privacy of the clients, distance etc.
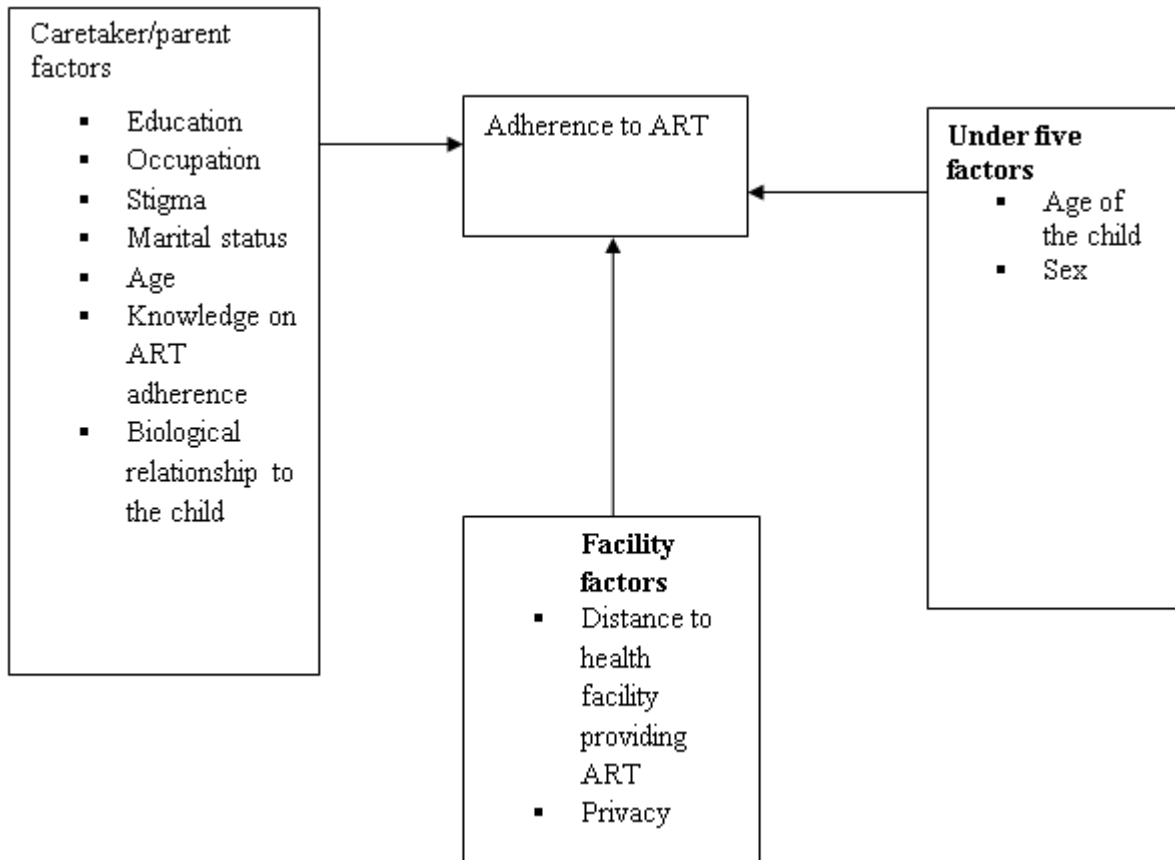
Figure 1: Conceptual Framework on Adherence to ARV Drugs among HIV+ Under Five

1.4 Rationale of the Study

Adherence to ART among HIV+ under five children in Tanzania with a particular focus in Dar es Salaam has not received significant attention and even the factors associated with such non adherence have not been well investigated. There is a notion that the way HIV + under five children adhere to ART in the city of Dar es Salaam is different from other cities due to the socio- economic disparities as well as the cultural mix that is not common in other cities as well. This study therefore, intended to assess the adherence of ART among HIV-Positive under-five children and associated factors in municipal hospitals in Dar es Salaam Region.

Findings from this study show the current situation of adherence to ARV in under-five patients in Dar es Salaam. Data from this study will be useful to health planners such as those at the Ministry of Health and Social Welfare to inform policies and programs which will mitigate the existing adherence challenges among under-fives. The findings potentially will enable Ministry of Health to design better programs to alleviate the problem of non-adherence to ARV in children and serves as resource for new research on identified gaps.

1.5 Research questions

1. What is the proportion of HIV positive under five children attending care and treatment clinics who adhere to ART?

2. What is the level of knowledge of mothers/care-takers of HIV positive under five children on the importance of adherence to ART?

3. What are the factors influencing adherence to ART among HIV positive under-five children?

1.6 Research Objectives

1.6.1 Broad Objective

To assess adherence of Anti-Retroviral Therapy (ART) and associated factors among HIV-Positive under-fives children attending HIV care in municipal hospitals in Dar salaam Region.

1.6.2 Specific Objectives

1. To determine the proportion of adherence to ART among the HIV positive under-five children attending care and Treatment clinics in Dar es Salaam.

2. To assess the knowledge levels on Adherence to ART among caretakers of HIV positive under five children attending care and Treatment clinics in Dar es Salaam

3. To determine factors associated with adherence to ART among HIV positive under five children attending care and Treatment clinics in Dar es Salaam

CHAPTER TWO

2.0 LITERATURE REVIEW

According to Eric and Daria (2012), Adhering to the ARVs is a crucial and central process for a patient to continually suppress the virus in the body, hence maintain his/her T-Lymphocyte immunity cells to avoid the opportunistic infection and have an overall improved life standard and prolonged life.

2.1 Adherence levels to ART

Adherence is defined as the ability of a patient to adopt behavior and attitude that serve to empower him/her to improve health and self-manage a given illness. Again it is the ability of a patient to take all medications as prescribed with no missed dose, i.e.; the right drugs, right dosage, right time, and right way, and therefore defined as optimal or successful for the ART when adherence to dosage regimen is ≥ 95% (Apha, 2004). Adherence to medication becomes a challenge when an individual has a chronic illness such as in the case of HIV and AIDS. Consequently, non-adherence to ART leads to a suboptimal drug level, which may result in therapeutic failure, deterioration of the immune system and/or emergence of drug-resistant HIV strains, predisposing the patient to opportunistic infections and death. Adherence to antiretroviral therapy (ART) therefore is a principal determinant of virology suppression. Prospective adult and pediatric studies have established a direct correlation between risk of virology failure and the proportion of missed doses of ARV drugs (Flynn et al; 2004).

Evidence on the global ART adherence suggests that the levels of adherence to ART among HIV infected children varied from 49% to 100% depending on the settings and the methods used (Vreeman & Wiehe, 2008). The self-caretakers' report has been used frequently to describe adherence with a highest level of adherence being reported ranging from 79.5-100% from such studies. A study on Ethiopian children by Biadgilign and others (2008) reported a high level of adherence to ART when caretakers were self-interviewed, indicating that this method had some benefits such as being simple despite the fact that it is prone to recall bias.

Pill count was established as a more objective method to assess medication adherence and was recommended as a standard method for clinical practice (Biadgilign, 2008)

In general, data on pediatric adherence to ARV is limited. Studies on adherence to antiretroviral therapy in children and adolescent indicate that fewer than 50% of children or caretaker reported full adherence to their regimens. In Kampala Uganda only 72% of children aged 2-18 years had adherence of > 95% as measured with home unannounced pill count compare to 89% which was measured using day self-reported adherence (Duff et all, 2010). Another study done in South Africa on adherence to ARV in young infants and children using medication return method found that 94% of children had good adherence (Mepham et all, 2011) while in Kilimanjaro Tanzania, a cross sectional Study (Nsheha et al, 2014) on adherence to antiretroviral therapy among HIV-infected children receiving care at Kilimanjaro Christian Medical Centre (KCMC) revealed that only 24.6% had a good adherence to their drug regimen, and that male children were significantly more adherent to ART as compared to females children (p = 0.04). Again, adherence among children who developed ART side effects were significantly worse (p = 0.01) compared to those who had less/no side effects. Adherence was also reported as significantly poor among those who could not attend clinic on regular basis (p = 0.01).

Further studies by Nyongea et al (2015) on determinants of antiretroviral adherence among HIV positive children and teenagers in rural Tanzania using a mixed methods study reported that of the 116 participants available for quantitative analysis, 70% were found to have high levels of ART adherence at an average rate of 84%. Living with a non-parent caretaker predicted poor adherence status. From the qualitative component, unfavorable school environment, timing of the morning ART dose, treatment longevity, non-parental (biological) care, preference for traditional medicine and forgetfulness were seen to be barriers for optimal adherence (Nyongea et al, 2015).

Gibb, in his study on adherence to antiretroviral therapy among pediatric and adolescent patients, reported adherence as problematic due to multiple factors such as pill burden, poor palatability, unpleasant flavor, side effects and long term toxicity. Other reasons which were

established to be associated with poor or non-adherence to ART were the caretaker type and income, disclosure of their children's HIV status to friends and relatives, caretaker-child communication, caretaker health belief, stigma, children refusal to take medications and forgetfulness. Also, the Caretaker being too busy or frequently away from home were found to be contributors of the low adherence to ART, particularly in pediatric patients (Gibb, 2003).

Poor adherence to ARV drugs is commonly encountered in the treatment of HIV-infected children. A variety of factors, including medication formulation, frequency of dosing, drug toxicities and side effects, child's age and developmental stage, as well as psychosocial and behavioral characteristics of children and parents, have been associated with non-adherence (Gibb, 2003). However, no predictors of either good or poor adherence in children have been consistently identified. Miller, in one study reported that the prevalence of non-adherence to medication across several diseases can be as high as 25% on average while in another study based on children with HIV infection, he showed adherence to ART ranging from 25% to 97% (Miller , 2014). Furthermore, several studies have demonstrated that adherence is not static and can vary with time on treatment. These findings illustrate the difficulty of maintaining high levels of adherence and underscores the need to work in partnership with families to ensure that adherence education, support, and assessment are integral components of care (Mellins & Brackis, 2004).

2.3 Knowledge of Mothers and caretakers on importance of adherence to ART

In three studies in Uganda, South Africa, and Tanzania, a lack of knowledge about health services and/or ART was associated with poor ART adherence (Mepham, 2011). Similarly, three other studies in Kenya, Ghana, and South Africa found that sufficient knowledge on ART initiation, adherence and/or retention during and after pregnancy favored future ART adherence of the children as were influenced by their mothers. For example, the Ghana study found that many study participants had a high level of essential HIV knowledge (e.g., routes of transmission; the role of ARVs in prolonging life), but that women with inadequate knowledge of PMTCT and ART were significantly more likely to be lost to follow-up (Duff et al, 2010)

In another study, Arage and colleagues reported that caretakers' knowledge about ART was significantly and independently associated with adherence of children on ART. Arage reported that if a caretaker was knowledgeable about ART treatment, the child was 2.7 times more likely to be adherent to ART. Those children whose caretakers had secondary level or higher educational status were 0.41% likely to be non-adherent than children whose caretakers were not able to read and write.

In a separate study by Linet (2011) on adherence in Kenya, the Primary caretakers level of education was found to independently be associated with adherence (p<0.05). Adherence rate was seen to increase with increasing primary caretaker level of education. The scholar also established that adherence was independently associated with primary caretaker's relationship with the child (p<0.05) (Linet, 2011). Mbirimtengerenji et al (2013) in Malawi also revealed that, in terms of level of knowledge, about 83.1% of women answered correctly that it means taking drugs at the right time as prescribed by the ART service provider. This suggests that ART non adherence could not be caused by inadequate knowledge level of the clients. However, 12.7% only concentrated on not becoming sick anyhow as the main factor. The rest (4.2%) concentrated only on prevention of resistance to ART as the cause of non-adherence factor. The women's likelihood action would be determined by the pandemic's serious- ness and perceived threats. The likelihood actions of women like seeking medical care would be influenced by social amenities that surround them like mass media HIV programs, frequent radio HIV advertisements, television comedies and close relative HIV infected serious illness or death (Klitzman, 2004). Furthermore, women particularly in Malawi believe that perceived benefits of preventive action must not outweigh the perceived barriers to preventive health action.

Another study conducted in Nigeria by Suleiman and Momo (2016) revealed that knowledge of the caretakers has significant effect on adherence to ART. They further found out that regarding overall knowledge of HIV/AIDS and treatment, 92.7% scored at least 70% indicating a good knowledge of HIV/AIDS and its therapy implications while the remaining 7.3% were poorly informed. Most of the respondents (58.9%) were on twice daily triple

combination first line regimen (zidovudine/ lamivudine/nevirapine), while 24.8% were on the once daily triple combination alternative first line regimen (tenofovir/lamivudine/efavirenz). Results also showed that 50.4% of the respondents did not miss any doses of their cART fourteen days (2 weeks) preceding their interview for the study while 49.6% missed at least one dose. 25.6% missed one dose, 14.3% missed two doses, and the remaining 8.7% missed three or more doses.

Another study from Nigeria by Olowookere et al (2012) reported that majority of the respondents had good knowledge and attitudes about HIV/AIDS and ART. They further ironed out that, a fair proportion of the respondents had poor knowledge about this disease and ART. For example, approximately one fifth (18.9%) of the study group did not know that unprotected heterosexual intercourse with an infected partner could result in HIV/AIDS, and 17% did not know that having multiple sexual partners increases the risk of infection. These findings indicated that there is a need to educate PLWHA on the modes of transmission of HIV/AIDS too as this lack of knowledge about HIV/AIDS and ART is probably another reason for the poor adherence to the ART among children.

2.4 Factors associated with adherence to ART among HIV positive under five children

Low adherence to ART has been caused by a number of factors including low commitment of caretaker and cooperation of the child, difficult taking ARV medication due to unpleasant flavor, smell, nausea, too many pills and side effects, demographic characteristics of both caretaker and a child, disclosure to child, distance to the clinic, food insecurity, caretaker-child communication, caretaker health believe, depression, stress, stigma and forgetfulness (Mghamba, 2012).

Adherence is a complex health behavior that is influenced by the drug regimen, patient and family factors, and patient-provider relationship (Mellins, 2009). The limited availability of palatable formulations and once-daily regimens for infants and young children is especially problematic (Chadwick et al, 2005). Furthermore, infants and children are dependent on others for medication administration; thus, assessment of the capacity for adherence to a complex,

multidrug regimen requires evaluation of the caretakers and their environments, as well as the ability and willingness of a child to take the drug. Barriers faced by adult caretakers that can contribute to non-adherence in children include forgetting doses, changes in routine, being too busy, and child refusal (Marhefka et al, 2008). Some caretakers may place too much responsibility for managing medications on older children and adolescents before they are developmentally able to undertake such tasks whereas others themselves face health and adherence challenges related to HIV infection, substance use, or mental health and other medical conditions. Other barriers to adherence include caretakers' unwillingness to disclose HIV infection status to the child and/or others, reluctance of caretakers to fill prescriptions locally, hiding or relabeling of medications to maintain secrecy within the household, absence of social support, and a tendency for doses to be missed if the parent is unavailable. Adherence may also be jeopardized by social issues within a family (e.g., substance abuse, unstable housing, poverty, involvement with the criminal justice system (Marhefka et al, 2008).

Previous studies on factors associated with adherence among children on ART have reported varying findings. On the positive side, it has been reported that caretakers' knowledge about antiretroviral treatment (Dachew et al, 2014; Arage et al, 2014) and caretaker's educational status (Arage et al, 2014) were significantly and independently associated with adherence of children to antiretroviral therapy. Other studies have found that male sex (Nsheha et al, 2014), marital status and age of caretakers (Eticha & Berhane, 2014) are associated with ART adherence. In addition, age of the child was independently associated with adherence in a study from Ethiopia (Dachew et al, 2014). Furthermore, disclosure of HIV status to other relatives was associated with better adherence in a study from Nigeria (Ugwu & Eneh, 2013). On the other hand, several studies have reported that low socioeconomic status is associated with poor ART adherence (Bhattacharya & Dubey, 2011; Nsheha et al, 2014; Ugwu & Eneh, 2013). Similarly, the Nigerian study reported that the caretaker's age, education, gender of the child and duration of ART did not significantly affect adherence (Ugwu & Eneh, 2013). Strategies that may improve adherence to antiretroviral therapy include taking medication at the same time every day, associate with daily activity (meal, tooth brushing), simple treatment

regimen, use of Fixed Drug Combination, use of alarm, watch pill boxes, reminder from treatment supporter and carrying extra dose when away from home.

Stigma is an important determinant of adherence in the settings of sub-Saharan countries according to studies conducted recently (Simon, 2007). Social or family stigmatization and fear of the consequences of revealing HIV infection status to sexual partners are closely related to poor adherence. Family plays a crucial role in any kind of treatment in children or adults Major issues related to family or caretaker that influence adherence include presence of anxiety; depression (ibid), active substance abuse, presence of HIV infection in another family member; fear of disclosure of HIV positivity to the family, family disruptions, belonging to racial minorities or other vulnerable groups of the population.

Family and community members can both play a positive and negative role in ART treatment initiation and adherence. For instance, the stigma associated with HIV infection or AIDS may be more severe than that of other illnesses, creating barriers to treatment initiation and support for adherence that might otherwise be available (Skovdal, 2011). On the positive side, family members and friends can play the role of treatment partners and provide much needed support. Patients need to be encouraged by health care workers to disclose their status. However, studies of interventions to facilitate disclosure are lacking. Social institutions like the church, nongovernmental organizations (NGOs) and food aid services play a crucial role in issues ranging from creating awareness about the illness, mobilizing support, facilitating treatment, and promoting adherence. For instance, in an evaluation program about the impact of family nutritional support during the first year of antiretroviral treatment in the west Africa region, family nutritional support for persons living with HIV initiating antiretroviral treatment showed a positive impact after six months (Weiser, 2006).

However, studies on ART adherence in Tanzania are limited and mostly have been focusing on adult, particularly pregnant women. This study intended to assess the pediatric adherence to ART in Dar es Salaam which is a busy city and with lots of infrastructural challenges which might also influence a poor adherence to ART for pediatric patients.

CHAPTER THREE

3: 0 RESEARCH METHODOLOGY

3.1 Study Design

This study was a cross-sectional descriptive study conducted among HIV infected children under five years of age. Information were collected from caretakers though interviews using a Swahili structured questionnaire.

3.2 Study Area

Dar es Salaam region lies along the Western Coast of the Indian Ocean. It boarders Pwani region in the North, West and South while to the East, there is the Indian Ocean. Administratively, Dar es Salaam Region is divided into 3 districts namely: Kinondoni, Ilala, and Temeke According to the 2012 Population and Housing Census, the Region had a population of 4,364,541 with a population average annual growth rate of 5.6 percent. In Dar es Salaam, there are more than 261,872 under five children which is equivalent to 6% of the entire population of the City (Dar es Salaam Profile, 2014). The average population per ward varied from 45,629 in Temeke District to 52,207 persons in Kinondoni District. At regional level, the average population per street was 9,656 persons ranging from 8,005 people per street/mtaa in Temeke District to 12,085 people per street in Ilala District

This study was conducted among under-five HIV positive children who received care and treatment from the three municipal hospitals in Dar es Salaam which are Mwananyamala, Amana and Temeke Hospitals. These are among the largest public hospitals in Dar es Salaam. The estimated HIV prevalence among the general population in Dar es Salaam is 6.9% (TACAIDS, 2013). Number of children infected with HIV in the region is estimated at 16,122 where those in ART to date are 7,872 and the target for Fiscal Year 2017 is 13,543 (DHIS2, 2016). These hospitals were selected for this study because they provide secondary health care services, equipped and accessible to those living with HIV virus.

3.3 Study Population

The study population was children under-five years of age who are HIV positive and are attending CTC in any of the three municipal hospitals in Dar es Salaam.

3.4 Inclusion criteria

All under-five HIV positive children who were on ART for more than six months were eligible for inclusion into the study. The six-month cutoff is used in Tanzania to define an established patient (a patient is considered new in the period below six months after being registered at CTC). Those patients with six months or more in the CTC services are defined as established because of their experience to the program.

Exclusion criteria

- The HIV positive under-fives children who came to the clinic with caretaker/parents under 18 years of age.
- Children who came with caretakers who had difficulties to communicate
- Under-five children who were seriously sick

3.5 Sample Size determination

The sample size was calculated using the following formula as proposed by Kothari (2006)

$n = z^2 p(1-p) / E^2$; Where n = minimum sample size required

P= Estimated proportion of under-five years HIV positive children adhering to ART. A Prevalence of 11.5% was used from a study from Management and Development for Health (MDH, 2007).

Z=1.96 (for 95% Confidence level)

E=Margin of error set at 5%

$n = 1.96^2*0.115*0.885/0.05^2$

$= 3.84*0.108/0.0025$

n= 156

After adjusting for non-respondents by using the formula N*10/100x156 the sample size was 172 under-five HIV positive children on ART adherence from three Municipal hospitals.

3.6 Sampling Methods

A systematic random sampling method was used to select the participants from the daily appointment list obtained from each clinic. At the time of the study, the three clinics had a total of 700 (N) children enrolled for ART, therefore a sampling fraction was n/N (172/700 =24.6%) approximately 25%. To obtain the desired sample size, 25% of children from each of the three clinics were included in the sample. Mwananyamala; 281*25% = 70, Amana 212 *25% = 53, and Temeke 207*25% = 52. Systematic random sampling was used to select children for the study from the daily appointment list at each of the three sites. First the number of children to be recruited daily was determined, depending on the total sample for each site. Since I had three weeks for data collection, the number of children per site per day of data collection was Mwananyamala: 70/3 days = 23 children per day, Amana: 53/3 days = 18 children per day and Temeke: 52/3 days = 17 children per day

Depending on the number of children in the appointment list, the sampling interval, k was calculated using the formula N/n (Where N is the total number of children listed in the appointment list for that day of data collection and n is the sample size for each day). After obtaining the sampling interval-k, I selected using random number table's one number between 1 and k. The number selected was my first child to be included in the sample for that day and later I included every kth child.

If any of the selected children did not attend the clinic on that day, I increased the sample size for the next day so as to attain the desired total sample size.

3.7 Variables
Independent:

Child characteristics: age, sex, age at HIV diagnosis, time on ART.

Caretaker characteristics: age, sex, level of education of the care giver, relationship with child, marital status, occupation, knowledge on adherence, disclosure to other relatives

Others characteristics: recruitment site

Dependent/outcome

The outcome of interest was ART adherence. Caretakers were asked to show the pills remaining since last visit and the pills were counted. The percent of pills taken was calculated by dividing the number of pills that the child took by the number of pills the child was supposed to take in a month.

3.8 Data collection procedure and tools

3.8.1 Data collection procedures

The principal investigator recruited three research assistants who had skills on HIV/AIDS care and assessment of adherence. The assistants were trained for one day to familiarize on the research purpose, objectives of the study and research tools including how to conduct interviews in order to obtain the accurate data within the granted time. Research ethics and logistic information were introduced. Each data collection day at CTC started with an introductory session about the objectives of the study, the methodology of data collection and assurance on confidentiality. All patients found at the waiting areas participated in the introductory session, but only those who were selected to participate were subjected to a written confidentiality agreement before the interview

3.8.2 Data collection tools

This study used a Swahili questionnaire as an instrument for data collection. (Appendix ii). All participant caretakers were asked the same standardize questions from the questionnaire about their knowledge and adherence to ART, along with basic demographic information. Exit interviews were done after patients had completed their clinical services. In average, each interview lasted for about 30 minutes.

3.9 Pre testing of questionnaire

Before data collection started pre testing of questionnaire was done to check for clarity, logic flow and consistency by using a sample of HIV positive under-fives children who are utilizing CTC services and meet study criteria at a health facility in Dar-es-salaam which was not included in the actual study. Review of collected data and modifications of questionnaire was done based on the pretesting experience.

3.10 Ethical Considerations

Ethical clearance to conduct the study was obtained from Research and Publication Ethical Committee of the Muhimbili University of Health and Allied Sciences (MUHAS). The permission to conduct research was obtained from the respective District authorities and the municipal health directors. In addition, a written consent was obtained from the respondents after a clear explanation of the study goals and objectives. To ensure confidentiality, respondents were not required to give their names during filling of the questionnaires. Furthermore, data was accessible only by those involved in the implementation of the study.

3.11 Data management, quality assurance, and statistical analysis

Children and caretakers' information were recorded in the questionnaire by trained research assistant. Data collected on the questionnaire was then checked for completeness and consistence by the researcher before the care taker left the facility. All missing, inconsistent responses were clarified at the site. Data was entered into the computer using excel sheet and then analyzed using SPSS statistical software. Categorical data were first summarized using frequencies and proportions. A pie chart was used to describe the pattern of ART adherence. Associations between various independent variables of interest with the outcome were then examined by a binary logistic regression.

All Variables with p value <0.20 were entered in the multiple logistic regression model. In addition, age and sex of the child and age of the caretaker were used in the multiple logistic regression models because they were considered important confounders.

Consequently, the multivariate odds ratios estimates were adjusted for age and sex of the child, recruitment site, level of education of the caretaker, occupation, disclosure to relatives, and caretaker's age. Sex of the caretaker was considered as an important confounder but since there were only nine men, the variable was not used in the multiple logistic regression model. The criterion for significance for all the analyses was a P value significant at a level of 0.05 and all P values were two-tailed.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction and general characteristics of the study participants

This chapter presents the findings of a study which was undertaken to assess adherence to antiretroviral therapy among HIV-infected under-five children in municipal hospitals in Dar es Salaam, Tanzania. A total of 172 children under-five years and their caretakers were recruited in the three municipal hospitals in Dar es Salaam.

The general characteristics of the 172 HIV-infected children and their caretakers who participated in this study are summarized in Table 1. The study population comprised of children under-five with median age of 36 months (range, 12-56 months), and 22 (12.8%) of these were younger than two years. There were 77 (44.8%) male children. The under-fives distribution according to the study sites were 38 (22.1%) children from Temeke, and 67 (39%) each from Mwananyamala and Amana hospitals. Almost 66% of children received their HIV diagnosis while younger than 12 months of age. More than eighty-one percent of children had been on ART for two or more years at the time of interview. Sixty-three of the caretakers were between the ages of 26-39 and nearly 95% were women. Almost 47 percent of caretakers had primary school education while about 48% had secondary education. Fifty-two percent of caretakers were married. More than 50 percent of caretakers were either involved in some business or were employed. One hundred and twenty-eight (74.4%) of the caretakers were biological parents of the children involved (Table 1 below)

Table 1: Characteristics of HIV-infected Children and Caretakers Involved in the Study

Characteristic	Number (%)
(Children)	
Age (months)	
<24	22 (12.8)
24-47	83 (48.3)
≥48	67 (39.0)
Sex	
Male	77 (44.8)
Female	95 (55.2)
Age at diagnosis of HIV (months)	
<12	113 (65.7)
12-24	44 (25.6)
>24	15 (8.7)
Time on ART (months)	
<12	32 (18.6)
12-24	87 (50.6)
>24	53 (30.8)
Center of recruitment	
Temeke	38 (22.1)
Amana	67 (39.0)
Mwananyamala	67 (39.0)
Caretakers	
Age (years)	
18-25	34 (19.7)
26-39	108 (62.8)
≥40	30 (17.4)
Sex	
Male	9 (5.2)
Female	163 (94.8)
Education level	
No formal education	10 (5.8)
Primary education	80 (46.5)
Secondary or more	82 (47.7)
Marital status	
Married	90 (52.3)
Single	54 (31.4)

Divorced	28 (16.3)
Occupation	
Businesswoman/man	71 (41.3)
Employed	21 (12.2)
Housewife	80 (46.5)
Relationship to the child	
Biological parent	128 (74.4)
Other relatives	44 (25.6)

4.2 Adherence to ART among HIV-infected children

ART adherence was assessed for one month. Caretakers were asked to show the pills remaining since last visit and the pills were counted. The percent of pills taken was calculated by dividing the number of pills that the child took by the total number of pills that the child was supposed to take in a month**.** An optimal ART adherence was defined as taking 95% or more of the doses of ART prescribed in a month, Results showed that about 65% of children did not have optimal ART adherence in the one month preceding the study.

4.3 Knowledge of caretakers of HIV-infected children on the importance of adhering to ART

Knowledge of caretakers in relation to ART adherence was assessed using seven questions that elicited knowledge of caretakers on issues related to ART adherence − including MTCT of HIV; drug resistance; and timing of ART in children. Each of the seven questions carried equal weight of 1 point for a correct response**.** On assessment, the Bloom's cut off points which were adopted from Ms. Nahida's KAP (knowledge, attitude and practice) Study of 2007 as originally categorized knowledge levels as follows:

- Low/Poor level= respondents answered correctly less than 50% of the 5 questions

- Moderate level= respondents answered correctly 50-74% of the 5questions

- High/Adequate knowledge=respondents answered correctly 75-100% of the seven questions

Figure 2 shows the knowledge of the caretakers in relation to ART adherence. Forty-Five (45%) of caretakers, had adequate knowledge on HIV and adherence issues.

Figure 2: Caretakers' knowledge in relation to ART adherence
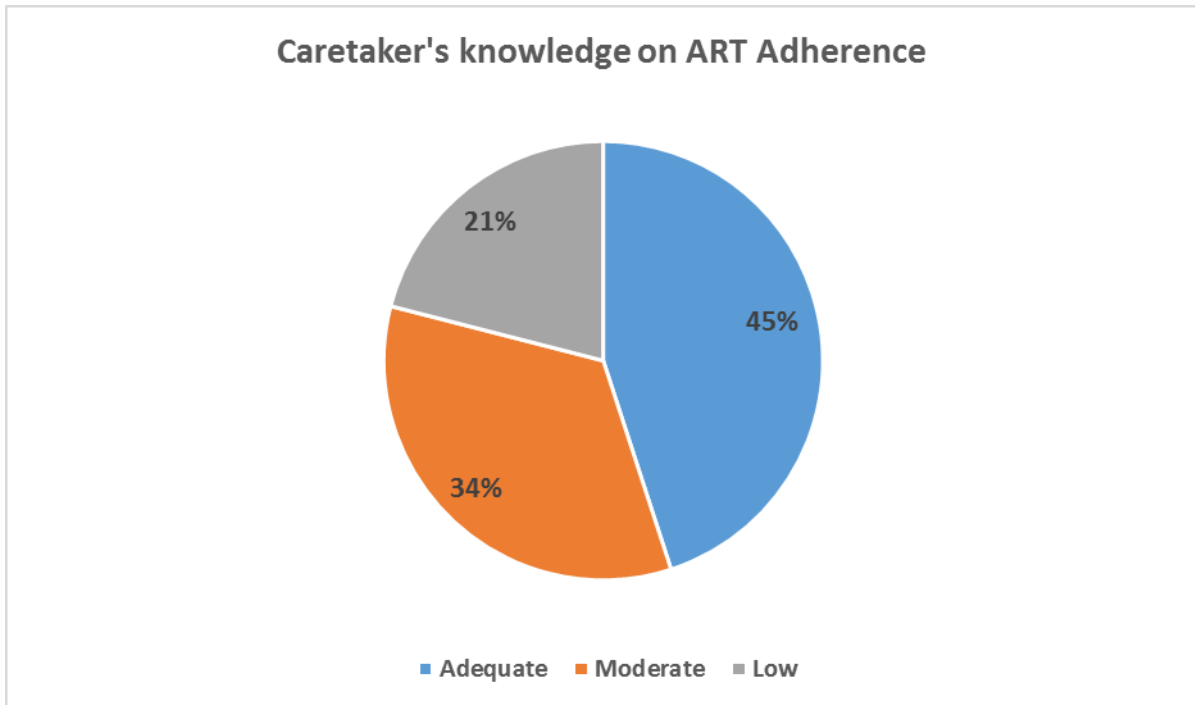
4.4 Factors associated with adherence to ART among HIV-infected children

The relationship between adherence to ART and various socio-demographic, clinical, and behavioral characteristics are shown in table 3. In bivariate analysis, children who received care from Amana and Mwanyamala had lower adherence rates compared to those who received care from Temeke hospital (OR, 0.18 (95% CI, 0.08, 0.44) and OR, 0.27 (95% CI, 0.12, 0.62) respectively. In addition, children whose caretakers were housewives had higher adherence rates compared to other types of occupations (OR, 4.28 (95% CI, 2.06, 8.89)). Disclosure of HIV status to other relatives was only associated with adherence on bivariate (OR, 0.36 (95% CI, 0.14, 0.91) but not multivariate analysis (OR, 0.82 (95% CI, 0.25, 2.70). On multivariate analysis, it was similarly found that, children of caretakers who were

housewives were more than four-folds more likely to be adherent (OR, 4.89, 95% CI, 2.08, 11.51, p<0.001) as compared with children from caretakers who were businessmen or women. On the other hand, receiving care from Amana municipal hospital and Mwananyamala municipal hospital was associated with lower rates of adherence compared to those from Temeke municipal hospital. There was no significant association between ART adherence and other characteristics such as age and sex of the child, age and sex of the caretaker, time on ART, level of education of the caretaker, knowledge of the caretaker or disclosure of HIV status to other relatives (Table 3, below)

Table 2: Number and proportion adherent vs non-adherent to ART

Characteristics	Number (%) not adherent	Number (%) adherent	Total
Children			
Age (months)			
<24	15 (68.2)	7 (31.8)	22
24-47	57 (68.7)	26 (31.3)	83
≥48	39 (58.2)	28 (41.8)	67
Sex			
Female	59 (62.1)	36 (37.9)	95
Male	52 (67.5)	25 (32.5)	77
Age at diagnosis of HIV (months)			
<12	71 (62.8)	42 (37.2)	113
12-24	31 (70.5)	13 (29.6)	44
>24	9 (60.0)	6 (40.0)	15
Time on ART (months)			
<12	23 (71.9)	9 (28.1)	32
12-24	55 (63.2)	32 (36.8)	87
>24	33 (62.3)	20 (37.7)	53
Center of recruitment			
Amana	51 (76.1)	16 (23.9)	67
Mwananyamala	46 (68.7)	21 (31.3)	67
Temeke	14 (36.8)	24 (63.2)	38
Caregivers			
Age (years)			

≤25	21 (61.8)	13 (38.2)	34
>25	90 (65.2)	48 (34.8)	138
Sex			
Female	102 (62.6)	61 (37.4)	163
Male	9 (100)	0 (0)	9
Education level			
No formal education	7 (70.0)	3 (30.0)	10
Primary education	46 (57.5)	34 (42.5)	80
Secondary or more	58 (70.7)	24 (29.3)	82
Relationship to the child			
Biological parent	85 (66.4)	43 (33.6)	128
Other relatives	26 (59.1)	18 (40.9)	44
Occupation			
Businesswoman/man	57 (80.3)	14 (19.7)	71
Employed	15 (71.4)	6 (28.6)	21
Housewife	39 (48.8)	41 (51.3)	80
Marital status			
Divorced	18 (64.3)	10 (35.7)	28
Married	62 (68.9)	28 (31.1)	90
Single	31 (57.4)	23 (42.6)	54
Knowledge			
Adequate	76 (62.8)	45 (37.2)	121
Moderate	12 (63.2)	7 (36.8)	19
Low	23 (71.9)	9 (28.1)	32
Disclosed to other relatives			
No	9 (42.9)	12 (57.1)	21
Yes	102 (67.6)	49 (32.5)	151

Table: 3 Factors associated with adherence to ART among HIV-infected under-fives

Factors	Univariate		Multivariate[a]	
	OR (95% CI)	P value	OR (95% CI)	P value
Children				
Age (months)				
<24	1.00		1.00	
24-47	0.98 (0.36, 2.68)	0.50	1.48 (0.45, 4.95)	0.81
≥48	1.54 (0.56, 4.27)	0.22	2.68 (0.77, 9.41)	0.07
Sex				
Male	0.79 (0.42, 1.48)	0.46	0.45 (0.20, 1.02)	0.06
Female	1.00		1.00	
Age at diagnosis of HIV (months)				
<12	1.00			
12-24	0.71 (0.33, 1.50)	0.35		
>24	1.13 (0.38, 3.39)	0.60		
Time on ART (months)				
<12	1.00			
12-24	1.49 (0.61, 3.60)	0.59		
>24	1.55 (0.60, 4.00)	0.51		
Center of recruitment				
Temeke	1.00		1.00	
Amana	0.18 (0.08, 0.44)	0.004	0.12 (0.04, 0.36)	0.01
Mwananyamala	0.27 (0.12, 0.62)	0.02	0.13 (0.04, 0.38)	0.02
Caretakers				
Age (years)				
≤25	1.00		1.00	
>25	0.86 (0.40, 1.87)	0.71	2.23 (0.80, 6.18)	0.12
Sex				
Female	1.00		1.00	
Male	0.79 (0.42, 1.48)	0.46	<0.001 (0.001)	0.97
Education level				
No formal education	1.00		1.00	
Primary education	1.73 (0.42, 7.16)	0.19	1.73 (0.31, 9.56)	0.37
Secondary or more	0.97 (0.23, 4.05)	0.48	1.20 (0.21, 6.93)	0.86
Marital status				

Married	0.81 (0.33, 1.99)	0.29		
Single	1.34 (0.52, 3.43)	0.27		
Divorced	1.00			
Occupation				
Businesswoman/man	1.00		1.00	
Employed	1.63 (0.54, 4.96)	0.64	1.66 (0.43, 6.46)	0.72
Housewife	4.28 (2.06, 8.89)	0.001	4.35 (1.84, 10.25)	0.01
Relationship to the child				
Biological parent	0.73 (0.36, 1.48)	0.38		
Other relatives	1.00			
Disclosed to other relatives				
Yes	0.36 (0.14, 0.91)	0.03	0.91 (0.27, 3.03)	0.87
No				
Knowledge				
Low	0.66 (0.28, 1.55)	0.39		
Moderate	0.99 (0.36, 2.68)	0.71		
Adequate	1.00			

[a]Adjusted for age and sex of child, site of recruitment, age, education, and occupation of the caretaker, and disclosure to other relatives

CHAPTER FIVE

5.0 DISCUSSION

Adherence to ART in pediatrics is critical in order to maximize the benefit of therapy. Sub-optimal adherence is associated with immunological and virological failure, drug resistance, and treatment failure (Mghamba et al, 2013). This chapter discusses the findings of the study that aimed to assess the adherence to ART treatment among the HIV positive children.

5.1 Proportion of HIV positive under-five children attending care and Treatment clinics in Dar es salaam who adhere to ART

This study intended to determine the proportion of the HIV positive children who adhered to ART in the three municipal hospitals in Dar es Salaam. In this study, the prevalence of high levels of ART adherence one month before the interview among children under-five was 35%, although lower that the 95% optimal level. This level of adherence was comparable with the level reported in a study from Addis Ababa, Ethiopia, where ART adherence was found to be 34.8% (Biressaw et al, 2013). The reported adherence was higher than the rate reported from a cross-sectional study among HIV-infected children receiving care at Kilimanjaro Christian Medical Centre (KCMC), in Northern Tanzania where only 24.6% of children had good adherence to their drug regimen (Nsheha et al, 2014). Many other studies such as those from Ethiopia (Eticha & Berhane, 2014; Arage et al, 2014; Biadgilign et al, 2008; Dachew et al, 2014) and Nigeria (Ugwu & Eneh, 2013) have reported higher adherence rates in the range of 76% to 90%. The different adherence rates may be as a result of the population studied, adherence assessment methodology and definition of adherence rates. In many of the previous studies (Biadgilign et al, 2008; Biressaw et al, 2013) for instance, adherence was reported in the past seven days before the interview. In the current study however, the ART adherence was assessed for a longer period of one month.

5.2 Knowledge level of care-takers of HIV positive under five children on the importance of adhering to ART

Majority of caretakers in this study had adequate knowledge on HIV and adherence issues. However, the findings contradict those of Arage and colleagues who reported that caretakers' knowledge about antiretroviral treatment was significantly and independently associated with adherence of children to antiretroviral therapy (Arage et al, 2014). The findings from the current study may be different because of the population studied. Furthermore, the methodology used to assess knowledge was different from those of the previous studies.

5.3 Factors associated with adherence to ART among HIV positive under five children attending care and treatment

This study assessed the relationship between adherence to ART and various socio-demographic, clinical, and behavioral characteristics. A number of factors have been reported as predictors of adherence among children on ART. For instance, several studies have reported that low socioeconomic status is associated with poor ART adherence (Bhattacharya & Dubey, 2011; Nsheha et al, 2014; Ugwu & Eneh, 2013). Findings from the current study showed that children of caretakers who were housewives were more than four-folds likely to be adherent compared with children from caretakers who were businessmen or women. This association is plausible given that housewives may spend more time with the children at home and thus be able to give medications as required. Businessmen and women on the other hand may be busy at place of business or travelling and hence have higher chance of missing some doses. Additionally, in the current study, children who received care from Amana and Mwananyamala municipal hospitals were less likely to be adherent compared to children who received care from Temeke municipal hospital. We hypothesize that this might have something to do with care and treatment program but did not collect information on health systems and we have no way of verifying it.

We did not find a significant association between ART adherence and other characteristics such as age of the child, sex, and time on ART, level of education, knowledge of the caretakers or disclosure of HIV status to other relatives. This is contrary to previous studies on

ART adherence among children (Nsheha et al, 2014; Eticha & Berhane, 2014). In a study on adherence to antiretroviral therapy among HIV-infected children receiving care at KCMC for instance, males were more than two-folds more likely to be adherent to ART than females (Nsheha et al, 2014). In another study, marital status and age of caretakers were associated with ART adherence (Eticha & Berhane, 2014). Arage and colleagues reported that caretakers' knowledge about antiretroviral treatment and caretaker's educational status were significantly and independently associated with adherence of children to antiretroviral therapy (Arage et al, 2014). In addition, age of the child and knowledge of caretakers about ART medication were independently associated with adherence in a study from Ethiopia (Dachew et al, 2014). The current study's findings are similar to those reported in Nigeria where the caretaker's age, education, gender of the child and duration of ART did not significantly affect adherence (Ugwu & Eneh, 2013). In the Nigerian study however, disclosure of HIV status to other relatives was associated with better adherence (Ugwu & Eneh, 2013)

In this study, biological parents were not associated with better adherence. These findings are similar to a study from Ethiopia (Eticha & Berhane, 2014). Nevertheless, a biological caretaker may experience a stronger emotional connection with the child and may be more motivated to promote better ART adherence compared with a non-biological caretaker (Haberer & Mellins, 2009).

The current study's findings are similar to those reported in Nigeria where the caretaker's age, education, gender of the child and duration of ART did not significantly affect adherence (Ugwu & Eneh, 2013). In the Nigerian study however, disclosure of HIV status to other relatives was associated with better adherence (Ugwu & Eneh, 2013)

5.4 Limitations of the Study

- The nature and design of the study does not allow assessment of causal relationships among the variables of interests to draw strong conclusions. A prospective cohort analysis could be more useful to generate data that would make causal inferences

- Time and financial resources constrained the design of this study and also the considered sample size which may not be a true representation of the population characteristics.

- Caretakers reports on the under-fives adherence to the ART programs are subject to recall bias which might lead to an over or underestimate of the adherence levels.

Despite of these study limitations, the objectives of the study were met by adhering to the prior set standards of interviews, the inclusion criteria, verification through pill counts and schedule adjustment when was necessary.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

This study showed that only the minority (35%) of the children under the age of five had optimal adherence to antiretroviral drugs and that majority (65%) had a poor ART adherence. Majority of caretakers in this study had adequate knowledge on HIV and adherence issues; however, this knowledge did not translate into optimal ART adherence. Children receiving care at Amana and Mwananyamala hospitals had lower rates of adherence relative to children who received care from Temeke municipal hospital. Nevertheless, despite the fact that Temeke had a higher level of adherence of 63%, it was still below the optimal adherence level of 95% as defined by the WHO. Furthermore, children whose caretakers were housewives were more likely to be adherent compared to those whose mothers are doing business or spend more time away from home.

6.2 Recommendations

This study recommends the following to take place:

- The Ministry of Health and other development partners should develop strategies and approaches aiming at translating caretaker's knowledge on adherence into high levels of ART adherence among under-fives to improve their quality of lives in all the three Municipalities of Dar es Salaam.
- Special interventions targeting caretakers who work or spend most time outside home should be designed to increase adherence on ART for the under-fives, such as phone sms reminders to alert the time for under-five medication and dates for clinic appointment
- Further studies on ART adherence is needed to allow a more critical assessment of causal relationships among the variables of interest and thus strong conclusions on the association could be drawn. A prospective cohort study would generate data that could be used to make causal inference.

- HIV/AIDS partners should conduct an operation research to learn why Ilala and Kinondoni were not doing as good as Temeke on adherence, and magnify the findings to escalate all three Municipals to reach the optimal ART adherence levels.

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APPENDICES

Appendix I: Questionnaire Of The Child

1. ID number of the child..

2. Interviewer number...

3. Name of facility...

4. Date of interview..

5. How old is the child...................... (Age in completed years).

6. Sex of the child............................1. Male   2. Female.

7. A) CD4 count/ %......................... b). HB in g/dl) ……………

SOCIAL DERMOGRAPHIC CHARACTERISTICS FOR PARENTS/CARETAKER

8. Sex of the care giver...........................

9. How old are you................................. (Age in complete years)

10What is the maximum level of education you attained

 a) No education

b) Primary education

c) Secondary education

d) Tertiary Education

11.What do you do to earn a living?

a) Business

b) Employed

c) house wife

d) Peasant e) Student

f) Other............................

12. What is your relationship with the child

a) Mother

b) Father

c) Aunt

d) Other.............................

13. What is your current marital status

a) Married

b) Single

c) Divorced

d) Cohabiting

e) Others........................

14. At what age was the child diagnosed as HIV positive?.......................(Age in months)

15. For how long is the child on antiretroviral therapy? Months.....................

16. Anthropometric measurement

Weight Kg…………….

Height/ length Cm…………………………

MUAC Cm……………………...

Conclusion. a) Normal b) mild malnutrition c) moderate malnutrition.

17.Have you ever disclosed the HIV status of your child to anyone?

a) Yes

 b) No...go to question no 19

18.If yes how many people have you disclosed to?

a) ………. number of people

b) I don't remember

c)I don't want to respond

    1.   To whom have you disclosed to?

       a). Father/Mother

   b). auntie /uncle to the child

   c) Sister/ brother of the child

   d) Grandparents of the child

   e) Friends to the parents

   Other (specify) ....

ASSESSMENT OF ADHERENCE AND NON ADHERENCE

19. i) Do you have medication with you? May I see them? Medication returned

(Amount)..........

ii) How many tablets do you take per day?........................(Number of tablets)

....

20 Please can you tell me when you give child medication? a) Morning

b) Afternoon c) Evening d) Morning and evening

e) Others...............

21. Did the child ever miss a dose of the ARV? a) Yes 2. No

22 If yes; how many times did a child miss the doses of ARV in the past one month? a) Only

one dose in a month (*97% adherence)* b) Two or more doses in a month *(<95% adherence)*

22. How many doses did the child miss in the past three months??

a) Three doses b) four to five doses c) More than five doses (<95% adherence)

23. Are there any other medications the child is taking? a) YES b) NO If yes go to

Question no 26

24. Which medication a) Septrine b) Herbal drug c) Ant TB

d) Other..................

25. Why do you think is a reason for your failure to give your child ARV medication in daily

basis as required? a) Simple forgetful b) Business travel c) child sleep all the time d) caretaker

busy with work. e) Other....................................

26. What assisted or reminder you to give child medication on time and

Regularly? A) Clock b) individual c) relatives e) others......

KNOWLEDGE QUESTION OF ART TO MOTHER/CARETECAR

27. Adherence to ART means giving him or her drugs as per prescribed? a) True b) False c) I

don't know

28. Disclosure of child HIV status in family members can prevent poor adherence of ART to

the child? a) True b) False c) I don't

29 Missing doses/taking incomplete doses can lead to resistance of drugs? A) True b) False c) I don't know

30. When is it recommended to start antiretroviral therapy among HIV infected under-five children's disease?

    1. 18 -24 months
    2. 25 -34 months
    3. 35-44 months
    4. 45 months and above
    5. None of the above

31. Do you know importance of adherence to antiretroviral therapy?

    1. Yes
    2. No

 If yes mention them

………………………………………………………………………………………………………

………………………………………………………………………………………………………

32. Where do you get information concerning adherence on antiretroviral therapy

    1. Books
    2. Seminars
    3. Internet
    4. Health care providers

33. Do you know effects/dangers of poor adherence?

1)Yes

2. No

If yes explain

………………………………………………………………………………………………………

……………………………………………………………………………………………………

Appendices II: Dodoso kwa Mtoto

1. Namba ya utambulisho ya mtoto...

2. Namba ya udahili...

3. Jina la kituo cha Afya..

4. Tarehe ya udahili..

5. Umri wa mtoto...

6. Jinsia ya mtoto..

7. a) CD4 Count/ %age................................b) HB

MZAZI/ MLEZI

8. Jinsia ya mzazi/mlezi...

9. umri wa mzazi /mlezi..

10Umefikia kiwango gani cha elimu? a) sijasoma

b) Shule msingi

c)Shule sekondari

d) Elimu ya juu

11. Kazi gani unafanya inakuwezesha kukidhi maisha ya kila siku a) mfanya biashara

b) Mfanyakazi wa mshahara

c) Mama wa nyumbani

d) Mkulima

e) Mwanafunzi

f) Nyinginezo..

12. Unahusiano gani na mtoto

a) Mama

b) Baba

c) Shangazi

d) Dada

e) Nyinginezo...

13.Kwa sasa una hali gani ya ndoa a) nimeoa/ nimeolewa

b. Sijaoa/sijaolewa

c) Tumetengana

d) Nyingine...

14. Mtoto aligunduliwa ana VVU akiwa na umri gani? Miezi..........................

15. Mtoto ametumia dawa kwa muda gani? Miezi.........

16. Vipimo   Uzito kg......

Urefu cm.........

Mzunguko wa mkono cm...........

    a) Kawaida

    b) Ana upungufu kidogo walishe

    c) Ana upungufu mkubwa wa lishe

17)Umemshirikisha mwana familia yeyote kuhusiana na hali ya maambukizi ya mtoto? a) Ndio b) Hapana, kama hapana nenda swali namba 19.

18)Ume washirikisha watu wangapi kuhusiana na hali ya mtoto ya maambukukizi? a) ……. Idadi ya watu b) Siku mbuki c) Sipo tayari kujibu

MATUMIZI DHABITI YA DAWA ZA VVU

19.i) Umekuja na dawa? Naweza kuziona? Hesabu/pima dawa

Zilizobaki/iliyobaki..........................

ii) Anakunywa vidonge vingapi kwa siku...

20. Ni muda gani anameza dawa a) asubuhi b) mchana c) jioni d) asubuhi na jion

21. Ni vidonge vingapi ulisahau kumpa mtoto jana? a) hajakosa b) kimoja c) viwili

22. Ni vidonge vingapi ulisahau kumpa mtoto juzi? a) sikuwahi kukosa b) mara moja

23.Ni dozi ngapi za dawa mtoto alikosa kumeza kwa siku tatu mfululizo ndani ya miezi sita iliyo pita?

a) hajakosa b) mara moja c) mara mbili d) mara tatu au zaidi

24. Kuna dawa nyingine mtoto anakunywa?

a) ndiyo b) hapana. Kama ndiyo nenda swali namba (26)

25. Kama ndiyo a) septrine b) dawa za miti shamba c) Dawa za TB

d) Nyingine taja.....................................

26.Unafikiri ni kwanini unashindwa kumpa mtoto wako dawa kwa wakati? a) Kusahau. b) Nasafiri sana c) Mtoto ana lala kupitiliza d) Nina kuwa kazini muda mwingi e) Ladha mbaya ya dawa f) Nyinginezo...........................

27Unafikiri ni nini kina kukumbusha kumpa mtoto dawa kwa wakati? a) saa

  d) Mimi mwenyewe c) ndugu d) nyingine..

  KUANGALIA UELEWA WA MZAZI AU MLEZI KUHUSU DAWA ZA VVU

28)Usugu wa dawa kwa mtoto anayeishi na VVU unaweza kuzuilika kwa kumpa mtoto dawa kama ulivoelekezwa na wahudumu wa afya?a)Ndio b)Hapana c)Sijui

29)Kushirikisha afya ya mtoto kwa ndugu unaoishi nao kunaweza mfanya mtoto apewe dawa kwa uthabiti? A)Ndio b)Hapana c)Sijui

30)Ukisahau kumpa mtoto wako dawa vidonge viwili mpaka vitatu anaweza pata usugu wa dawa? a)Ndio b)Hapana c)Sijui

31)Ni wakati gani mtoto anatakiwa kuanza dawa mara anapogundulika anamaambukizi ya VVU?1)18-24 month(2)25-34(3)35 -40(4)45 and above(5)Hakuna jibu hapo juu.

32)Unapata wapi taarifa kuhusiana na matumizi ya dawa za kupunguza makali ya VVU? 1)Vitabu 2)Semina 3)Wahudumu wa afya 4)vyombo vya habari.

33)Unaelewa madhara yakutokutumia au kutompa mtoto dawa za kupunguza makali ya VVU? 1)Ndio 2)Hapana 3)Kama ndio zitaje…………………………………………

Appendix III: Consent Form (English Version)

Adherence to Antiretroviral Therapy among HIV positive under five children attending municipal hospital in Dar es Salaam.

Greetings! my name is Odilia Njau a student of Master in Public Health at Muhimbili University of Health and Allied Sciences (MUHAS). Am doing a research of assessing ADHERENCE OF ANTRETREVIRAL THERAPY AMONG CHILDREN UNDERFIVE LIVING WITH HIV ATTENDING MUNICIPAL HOSPITAL IN DAR ES SALAAM.

Purpose of the study: The purpose of conducting this study is to assess caretaker/parents knowledge and practice about adherence on Antiretroviral therapy among under-five HIV positive. The findings will be useful to health planners and other stakeholders working with preventive measure programs designing interventions with the aim to reduce morbidity and mortality rate of children under five living with HIV/AIDS.

What participation involves: If you agree to join this study. You will be required to answer a series of questions that have been prepared for the study in order to obtain relevant information regarding the research objectives.

Confidentiality: All information that will be obtained will remain confidential and will be used only for the purpose of this study. You are not supposed to write down your name, but we will use only the identification number.

Risks: You will be responding to questions pertaining to your health and access to formal health service. Feel free not to answer any particular question that you think you are not comfortable with. We do not expect any harm to happen to you because of participating in this study.

Benefits: Your participation in this study is valuable as the information obtained from you will enable the researcher to collect information which will inform health planners and other stakeholders to find the best way to provide health care services thus reducing the burden of morbidity and mortality in under five living with HIV in the country.

In case of Injury: It is not anticipated that any harm will occur to you as a result of participating in this study

Whom to contact: For any clarification about this study do not hesitate to contact the Principal Investigator

Odilia Njau

P. O. Box -65001 Dares Salaam,

Tel-0714488849

If you   have questions about your rights as a participant, you may contact Professor Aboud Said

The Chairperson of the Senate Research and Publications Committee,

P. O. Box 65001, Dare s Salaam.

Tel: +255 222152489.

Signature

Do you agree?

Participant agrees...

Participant does not agree...

I agree to participate in this study

Signature of Participant …………………………….Thumb………………………

Signature of researcher/ research Assistant…………………………………

Date of signed consent ……………………………………………

Appendix IV : Ridhaa Ya Mzazi/Mlezi

KICHWA CHA HABARI: MATUMIZI THABITI YA DAWA YA VIRUSI VYA UKIMWI (VVU)KWA WATOTO CHINI YA MIAKA MITANO DAR ES SALAM

Habari, **mimi ni Odilia Njau** ni mwanafunzi wa chuo kikuu cha sayansi na tiba Muhimbili ninayeshiriki katika utafiti wenye lengo la kuangalia uzingatiaji wa dawa za maambukizi ya virusi vya ukimwi kwa watoto chini ya miaka mitano.

Dhumuni la utafiti

Dhumuni la kufanya utafiti huu ni kutaka kujua uzingatiaji wa dawa za maambukizi ya virusi vya ukimwi kwa watoto chini ya miaka mitano. Unaombwa kushiriki katika utafiti huu. Kama utakubali kushiriki, utaulizwa maswali ambayo utayajibu kulingana na uelewa wako ili kusaidia kupata taarifa za kutimiza malengo ya utafiti.

Usiri Taarifa utakazozitoa zitatunzwa kwa usiri naz itatumika kwa malengo ya utafiti huu tu . Hautatakiwa kuandika jina lako ila tutatumia namba ya utambulisho/ namba ya kitambulisho chako cha kazini.

Ushiriki unao hitajika

Utakapokubali kushiriki katika utafitii huu utahitajika kujibu maswali utasomewa maswali hayo ili uweze kuyajibu.

Faida ya kushiriki katika utafiti

Kushiki kwako katika utafiti huu kuna faida, kwani taarifa utakazozitoa zitawezesha watu wa mipango na wanao husika na maswala ya kuandaa mikakati thabiti kwa ajili ya kuzuia usugu wa dawa za VVU, magonjwa nyemelezi na vifo vya watoto.

Endapoutadhuurika

Hatutegemei kuwa utapata madhara kwa kushiriki katika utafiti huu ila pakitokea tatizo,
Watu wa kuwasiliana nao.
Kama una maswali kuhusu utafiti huu wasiliana na mratibu wa utafiti huu, Odilia Kisenge
S.L.P 65001 muhimbili, Dar es Salaam,

Simu: 0714488849

Kama utakuwa na swaili kuhusiana na haki zako kama mshiriki wa utafiti huu wasiliana na profesa Aboud Said

Mwenye kiti wa kamati ya utafiti ya chuo,

S.L.P 65001, Dar es Salaam.

Simuna: +255 222152489.

Je unakubali kushiriki katika utafiti huu?

Ndiyo …………………………………………………………………………………

Hapana…………………………………………………………………………………

Sahihi ya mshiriki …………………………

Dole Gumba…………………………………………………

Sahihi ya mtafiti/ mtafiti msaidizi…………………………………………………………

Imesainiwa leo tarehe……