

12-2013

Factors Influencing the Decision and Ability to Seek Health Services Among HIV/AIDS Patients in Tanzania

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FACTORS INFLUENCING THE DECISION AND ABILITY TO SEEK HEALTH
SERVICES AMONG HIV/AIDS PATIENTS IN TANZANIA

A Thesis
Presented to
The Faculty of the Department of Public Health
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
Of the Requirements for the Degree
Master of Health Administration

By
Savitri Grover

December 2013

FACTORS INFLUENCING THE DECISION TO SEEK HEALTH SERVICES
AMONG HIV/AIDS PATIENTS IN TANZANIA

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I would like to dedicate my work to my husband Prateek Grover. I could not have done this without his faith on me and making me feel good even for the smallest achievements in life. With him I have learned the importance of following our dreams. Thank you for standing by me and for being a great support

ACKNOWLEDGEMENTS

First I would like to thank “GOD” for all the opportunities I had in my life. This work could not be completed without the support and guidance from various people involved professionally and personally. First of all I like to thank my mother in law (Champa Grover) and father in law (Col. Gulshan Grover) for supporting my higher education. They have always provided their valuable contribution in the form of advice, encouragement and care. The constant reminder from my mother in law to eat well while I was too busy really made me felt loved and cared even with a distance of thousands of miles. I cannot forget to thank my parents for listening and encouraging me to follow my dreams. I know my dad sometimes could not agree with my decisions, but he let me explore them and let me learn by my own life experiences. I know even if they could not understand all the technicality from my work and my career goals, they have always been very proud of me. They helped me become a better person and taught me to make the best use of whatever life has to offer. I am also thankful to my only sibling, my elder sister Radha; she has always supported me even when sometimes the mistake is mine. Garima Grover is a special motivation to me, her smiling face helps me forget everything else, and I can be just myself with her.

At WKU there are many people I like to thank. I could not start this thesis without Dr. William Mkanta. While I was trying to find someone to discuss about my research interest, Dr. Mkanta, listened to me and encouraged me to go ahead with my idea. He motivated me throughout my work. I never felt stressed in his presence; he always smiled and said “you are doing well”. That’s what made me confident about my work and kept me going. He is a great mentor and a really wonderful person.

I also like to thank my committee members Dr. Fan and Dr. Watkins. I really thank them on agreeing to be on my committee. I always enjoyed Dr. Fan's classes, advising and encouragement, he is a great listener. Though I have not taken any classes with Dr. Watkins, I really respect her as a person, always smiling and positive towards life is something great about her. She always had something valuable to add to the thesis during our committee meetings.

I would also like to thank to my friends Reena, Avi, Ranjana, at WKU they always motivated and encouraged me for who I am and listened through my boring talks. Steve thanks for constantly reminding me that I can do it. All my fellow classmates at MHA program and professors have made my experience a great one. Also, last but not the least I would like to thank Demographic and Health Survey for making the data available for interested researchers and institutions.

CONTENTS

Introduction	1
Literature Review	6
Research Methods	16
Findings of the Study.....	22
Discussion and Conclusion.....	32
References.....	38
Abbreviation.....	42

LIST OF DIAGRAMS

Diagram 1: Conceptual framework of the study.....	17
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LIST OF TABLES

Table 1. 2011 HIV/AIDS Demographics, Tanzania.....	4
Table 2. Comparison of two studies on HAART adherence.....	8
Table 3. Summary of the Studies from literature review.....	14
Table 4. Key findings from the studies in literature review.....	15
Table 5. List of the variables included in the study.....	20
Table 6. Descriptive Statistics, N=839.....	23
Table 7. Educational level of males and females by location.....	24
Table 8. Comparison of the wealth index among rural and urban population.....	26
Table 9. Parameter Estimates from multinomial logistic regression.....	28

FACTORS INFLUENCING THE DECISION TO SEEK HEALTH SERVICES
AMONG HIV/AIDS PATIENTS IN TANZANIA.

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December 2013

42 Pages

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Understanding the barriers to treatment for individuals with HIV/AIDS in developing countries could have a major impact on their ability to seek healthcare services. The purpose of this study is to quantitatively analyze the effect of daily activities and structural factors, which act as barriers to seeking health services for individuals living with HIV/AIDS in Tanzania.

The study is based on the hypothesis that (1) Individuals living with HIV/AIDS who face both personal and structural barriers have poor health compared to those not facing the barriers. (2) Individuals living with HIV/AIDS demonstrate different decisions and abilities to seek health services depending on their socioeconomic and clinical factors. A retrospective study design has been chosen for the current project. The source data-set comprises demographic and health surveys (DHS) in 2011-12 with N=839, male=661, female=178 the independent variables identified have been sub classified into, structural, personal, and socioeconomic groups. The data is analyzed using SPSS Statistical Package for Social Science, version 20. The data analysis shows the significant relationship between various variables included in the study such as owning livestock and frequency of eating meat in a week, distance from the health facility and the mode of transportation. We subdivided the data into these categories: urban, rural, male and female for further analysis. Based upon the results from the study, resources can be

managed optimally so as to minimize costs and treatment delays / failures for individuals suffering with HIV/AIDS, especially in the context of developing world. These results could be applied to other developing countries as well. The global picture relates to maximizing the benefits and minimizing healthcare costs as a way to reducing morbidity and mortality in HIV/AIDS populations in developing countries.

Introduction

HIV/AIDS

Living with HIV infection comes with many consequences. Secondary infections are one of the most significant of those consequences. People living with HIV/AIDS worldwide have probably experienced the burden of secondary infections. However, living with HIV/AIDS in a developing country where getting basic necessities such as food is a challenge, getting the treatment makes life more difficult for the inhabitants. Most developing countries have basic health care facilities that are not sufficient for the needs of the general population. The question becomes how do people living with HIV/AIDS survive, maintain their health and well-being in such an environment? How do they decide when to seek the needed health care in the mist of other competing needs; and when the decision is made to seek treatment are they able to get the needed or optimal services.

This study examines the barriers and access to Tanzania's health services for HIV/AIDS patients. The primary purpose of this study is to analyze the extent by which the daily activities or routines and structural factors act as barriers to seeking health services among people living with HIV/AIDS. The Second aim of this study is to examine the impact of these barriers in the health seeking behavior of the people living with HIV/AIDS. Third aim is to recommend the steps necessary in reducing the impact of these barriers on the health seeking behavior of the people living with HIV/AIDS.

HIV/AIDS infection has affected the entire world since it was initially reported in 1981 by the Centers for Disease Control and Prevention CDC in Atlanta, Georgia.

HIV/AIDS infection has taken a toll since then (34 million people worldwide living with HIV/AIDS, UN) and has become an economic and social burden. AIDS is the fourth leading cause of death in the world, however, in Sub Saharan Africa; AIDS is the number one cause of death among children's below the age of five. Although HIV infection never discriminates on the basis of race, color, ethnicity and nationality; somehow we have observed differences due to economic, social and cultural factors. According to a report from Global AIDS statistics, 97% affected populations are those in the developing and middle-income countries. A report published by WHO and UNAIDS in 2007 states that among all the death 76% were due to the AIDS.

Tanzania and HIV/AIDS

Tanzania, also known as the United Republic of Tanzania, is located in East Africa. According to the World Bank (2011) data, Tanzania is one of the largest countries in east Africa with a population above 46 million. According to the CIA (2011) data, 55% of the population is between 15-64 years. The main source of income is agriculture though the country is also known for its natural resources. HIV/AIDS is one of the leading causes of death with 86,000 deaths in 2009. In 2009 the prevalence of HIV/AIDS in adults was 5.6%. With a significant proportion of the country affected with HIV, the prevalence of secondary diseases also increases and efforts in preventing these secondary infections could help in saving lives and improving the quality of life.

It is a known fact that HIV infection attacks the immune system and makes HIV patients more vulnerable towards various diseases. Previously, HIV/AIDS was considered a death sentence, but today with medication, life can be prolonged. The large

amount of medication required to live with this disease can consume one's life. Hence, a point is reached when people start prioritizing between their treatment and other daily responsibilities.

There are everyday tasks such as fetching water, food or perhaps meeting daily requirements that may not be perceived as barriers in a developed country, but when it takes the whole day to attend them and they might become barriers. Also, there are other compelling factors like socioeconomic status and educational level which directly affects their decisions. The spread of HIV could be greatly reduced in developing countries with awareness and proper utilization of the resources. According to the latest literacy rate published in UNESCO (2011), the female literacy rate is lower than males for both adults and youth. Below is the table depicting the HIV/AIDS demographics for Tanzania.

Table 1: 2011 HIV/AIDS Demographics, Tanzania

HIV indicator	%
Overall HIV prevalence	5.1
Women	6.2
Male	3.8
HIV Prevalence by Residence	
Urban	
Women	8.9
Men	5.2
Rural	
Women	5.1
Men	3.4
Prevalence by Marital status	
Never married	
Male	1.2
Female	3.3
Married	
Male	5.4
Female	5.2
Divorced	
Male	8.9
Female	15.2
Widow	
Male	27.9
Female	24.7

Source- Demographic and health survey HIV and malaria indicator report 2011-12

The report also indicates the increase in the prevalence of HIV with increasing age. The young population is considered between the age of 15-24 and the prevalence is higher among young females 6.6% while young men's rate is 2.8%.

When the first three cases of HIV were identified in Tanzania in Kagera region in the year 1983, there was no prediction that HIV would spread to the whole sub-Saharan region. Today after 30 years, HIV is one of the most common health concerns in this part of the world. The spread of HIV is affected by various structural issues which include social, political, educational, gender base discrimination and poverty. As a result, medication alone is not the only factor influencing the lives of these individuals. All structural barriers must be considered, when developing an approach of treatment for a population suffering with HIV/AIDS. Influenced by this complex structure, this study focused on understanding the barriers and how the elimination of these obstacles could improve treatment. This approach, considering all the barriers, could prove to be the least costly option in maintaining health and quality of lives of people living with HIV/AIDS.

Literature Review

Adherence to HAART is an important aspect of most HIV/AIDS treatment programs worldwide. There are several studies focused on HAART adherence and explored different factors/variables that negatively affecting the adherence.

Cost of ARV treatment

Adherence to the HAART treatment was assessed in a study in sub Saharan Africa. The study looked at the reason for the adherence to the ARV treatment. The study was done by the qualitative interview of the people purchasing low cost antiretroviral therapy. The study looked at the social dynamics including the financial constraints that make individuals adhere to treatment (Crane et al, 2003-04). Findings from the study showed that even with the financial constrain the adherence rates were high due the fear of death. Additionally, the concern about family members increased their desire to live. The study also found another reasons for non-adherence is when a person could not afford to buy the pills. The Study concluded that the people who purchased the antiretroviral therapy in Uganda had a higher motivation for adherence. The only reason for the failure to adherence is the access to the medication. However, the study focused only on the urban location and the population size was small. The suburban or rural population might not have the same motivation level. Also it is difficult to comment on the availability of the cheap medical supply to the urban region. Finance as mentioned in the study was only barriers however; there might be other barriers which affect the adherence. These facts mentioned in the study might not be completely true for the rural population. Availability and buying power of medication are important factors, but social

obligations must also be considered. The study mentions that the individuals getting treatment at a level where their median CD4 count is 68 suggest there is a lack of awareness of other issues which prevent them to seek treatment before the conditions becomes worse. Sometimes people buy these medications when they are chronically ill and this brings us to the question why they decide to buy medication this late.

In another study done in Botswana (Weiser et al, 2003) the results shows that 70% of the non-adherence to ARV treatment is related to cost. The study included people (48%) who admitted to have difficulties with the treatment adherence. Among this group 70% agreed on the cost factor. Among these, 44% of the non-adherence was contributed directly to cost while 55% claimed their overall financial status as the main issue to the treatment adherence. The additional economic factors include medical expense, unavailability of food, cloth for patient and their family. The study found the self-reported adherence rate (54%) was comparable with most developed countries (40% - 70%). Negatively, however, the study was based on self-reporting of the patient who has an associated reporting bias. One of the inclusion criteria was patients with the medical insurance which suggests that patient with low socio economic status who could not have insurance were excluded, and hence the associated variable which could have played a vital role in the results.

Table 2- Comparison of the two studies on HARRT adherence

Aspect	Crane, 2006	Weiser,2003
Sub Saharan Africa	√	√
Mean age	35.4Yr	39-40Yr
Male	35.6%	50%
Female	64.4%	50%
Adherence	-	54%

Both studies have similarities in terms of geographic location and the common factor of ARV cost as a barrier. However, there are different sub variable, which differ in both studies. While Weiser's study included marital status and level of education, Crane's study included unemployment level and baseline CD4 count in their demographic information. These are very vital set of data as married vs. single can affect the level of responsibility and it can directly affect adherence. At the same time, information about employment status and income level could directly correlate with the household size and the predictability of the continuations of the treatment. Both studies irrespective of the difference in the adherence rate suggest that the financial barrier is a key player in the treatment adherence.

The study done by Boyer et al. (2009) also focused on finance as a barrier to the HIV treatment through a national cross-sectional survey in Yaounde, Cameroon. The sample size in the study was 707 and out of this 532 (75.2%) patients were getting ARV treatment at the time of the survey. Among the survey population almost, 91% lived in the urban and semi urban settings. Additionally, two thirds of the sample populations

were female and the average age of the sample was 38 years. Study results indicated almost 20% (107) of the patients faced some financial obstacles in getting their medication for the treatment. The study explains the health care system of the Cameroon which is a mix of the public and the private sector and patients pay for the treatment. Patients identified as indigent get the exemption from the fee, though this applies only to the 10% of the patient in each facility. This implies that 90% of the indigent pay for the medication. The study results also indicate the relationship between the sample that faced difficulties in purchasing the ARV treatment and their age and household income. According to the study, most of these patients were young and had low household income compared with the rest of the sample population. The study tries to establish the relationship between ages, income, and relationships structure with the ARV treatment adherence. However, the sample was taken from a wealthy area of the Cameroon. This would not give a realistic view of the low socioeconomic area and their issues with the treatment adherence. The suggestion from the study includes the implementation of free access to the treatment.

Cost of transportation and HAART adherence

Some studies also included transportation cost as a barrier while studying HAART adherence (Tuller et al, 2010). The study done in sub Saharan Africa mentioned the cost of transportation to visit the clinic as a barrier to treatment adherence. This study included 41 people from urban and rural areas who were interviewed and the finding suggested that even with higher motivation to adherence to HAART, transportation cost affects their decision. The study also mentioned that with the limited amount of money, people prefer to buy food and other livelihood first. The sample size is very small to

represent the whole of sub Saharan Africa. People who were lost in the follow up were not interviewed. Study could have stronger evidence if people who were lost in follow up had transportation as a barrier or something else which stopped them from getting the treatment.

Stigma as a factor to non-adherence

A qualitative study (Garumma T Feyissa, Abebe, Gima and Woldie, 2012) looked at the stigma and discrimination faced by people with HIV/AIDS through healthcare providers. A self-administrative questionnaire was used to collect the socioeconomic, educational and other relevant data (n=255). The study associated the knowledge level of the healthcare professional with the level of stigma and discriminations. The fear of work related transmission (52.3%) among healthcare is the indicator of the presence of discrimination. The study concludes that healthcare professionals with higher educational level (first degree or above) have lower level of stigma. Professional with lower level of education (diploma or lower) had a higher stigma level. Another association is the level of experience among healthcare professional and the lower stigma level. Relationship of stigma and healthcare professional was measured by dimensions, educational level, income level, and degree of religious belief. This study supports the fact that the level of education does play a crucial role in the level of understanding even among the HIV patients and the society.

Stigma and its association with social support are reviewed in one of the qualitative studies (Kumarasamy, 2005). The study looked at barriers and facilitators related to the adherence in India. The study correlated the stigma and the social support

from spouse, family, friends and its effects on the adherence. The study indicates that people getting treatment are aware of the benefits of continued treatment. Patients are motivated to adhere to the treatment if there is support from family and society. The high adherence rate is consistent with the studies reviewed above. However, the stigma and associated effect of this on social support negatively affect adherence. The simple fear of taking medication in front of others affects. The following are the findings from the study about disclosing/discussing HIV status with family and friends. About 21.6% of those who are taking ARV have not told at least one of their family members, this includes a fear of rejection by the family members. Also, 23% of these have not disclosed their HIV status to their friends and sex partners. Among those who are not currently undergoing ARV, 63% stated cost associated with medication, travel and more than one person in the household getting treatment as barriers to non-adherence. This study gives a basis to compare the results found in sub-Saharan Africa with other developing countries. Cost related with buying ARV treatment and traveling seems to be the common concern among the residents while stigma differs in these countries.

Food as a barrier to HAART adherence

Developing country like Uganda in sub Saharan Africa often faces meeting food requirement as a major barrier to the treatment adherence (Weiser et al, 2010). The study (n=47, F=30, M=17) was done through an in depth interview of the sample population who were HIV positive. The study looked at the different ways food can act as a treatment barrier to the patients. The five different interactions were found

1. Increased appetite related to ARV treatment
2. Amplified side effects related to less consumption of food with treatment.
3. Belief that the ARV treatment should not be continued/skipped in absence of food
4. Competing cost between food and medication leading to people choosing between the two.
5. Forgetting to take medications while working for long hours to meet the food needs.

In spite of the high adherence rate and motivation in sub Saharan Africa, HIV/AIDS case fatality is still high and this study surely points out an important issue which directly affects the treatment regimen. However, the sample population majorly represented the urban population and this makes it difficult to do a valid comparison of negative impact of food on treatment adherence. Certainly the barriers in urban population would be different than just food.

Adherence in Developed and Developing Countries

Most developing countries share common barriers and issues when it comes to HIV/AIDS. Though comparing it to developed countries situation is totally different. A systematic review of this difference was done in a meta-analysis of 84 studies (Mills et al, 2006). The study recorded 33 barriers and grouped them under patient related, medication related, daily schedules and interpersonal relationships. Among these selected studies 85.71% were from developing countries and remaining from developed countries.

Among the study from developed country approximately 78% were conducted in USA. The common patient related barriers for both developing and developed countries

were fear of disclosure, forgetting to take medication and co-existing substance abuse. Similarly when it comes to the belief about medication patients have common doubts about efficacy, side effects, complicated regimens and feeling healthy which have negative outcomes on HAART adherence. However, when it comes to daily schedule studies in developed countries mentioned chaotic schedule, difficulty follow medication with busy work schedule and difficulty in following related dietary regimen, refill issues. At the same time developing countries study supported traveling long distance, transportation related difficulties and irregular supply.

There are many more studies which look at the adherence but most of them focus on single barriers. Below is the summary table from various relevant studies used.

Table 3- Summary of the studies from literature review.

Reference	Stigma	Cost of ARV	Food	SES	Social & family support	Transportation cost	Education	Portable water	Distance from health facility	Culture
Weise,2003	√	√								
Kumarasamy, 2005	√	√		√	√					
Crane, 2006		√								
Mills,2006	√				√					
Wanjohi, 2009	√		√	√	√	√	√			√
Weiser, 2010			√							
Tuller, 2010						√				
Curioso, 2010	√		√							
Rachlis, 2011	√	√	√							
Feyissa, 2012	√									

The studies mentioned in the table 3 look at the factors for non-adherence to HAART treatment among HIV/AIDS patients were included in the literature review.

After analyzing the data, the most common factors studied were HAART adherence, financial stigma similar to the previous literature review. Socio economic

condition, knowledge, education level and side effect were the second most common factors studied. Less studied factors included disability benefits, work environment and clinical outcomes are among the least common studied factors. The sample size varied between all the studies, the common method used was the survey / interview, followed by cross sectional study and systematic reviews.

Adherence rate to treatment was different for different studies, which is associated with the factors included in the studies. Cost and social stigma similar to the previous articles reviewed are the most common barriers. Education level, knowledge, side effect and travelling distance are some new factors included in these studies and cited as barriers. Other causes are failure of treatment, disability benefit; clinical outcomes of treatment are also cited as barrier in some studies.

Table 4- Key Findings from the studies in the literature review.

Reference	High Adherence	Cost of ARV	Stigma	Food	Transportation	Side effects	Travel	“Simply Forgot”	Report Consistence
Weise,2003	+	+++	++			+	+		+
Kumarassamy, 2005		+	+						
Crane, 2006	+	+							
Mills,2006			+			+		+	
Wanjohi,2009	+		+			++			
Weiser, 2010				+					
Tuller, 20010	+				++				
Curioso, 2010			+					++	+
Rachlis, 2011		+							

Research Methods

Research Design

The current study is a retrospective study from the data collected by Demographic and Health Survey (DHS) in 2011-2012. The data is collected through a standard DHS questionnaire which collects information about families, individuals and households. However, the questionnaire is sometimes modified based on the country and the geographic location. The DHS also collect data for HIV and Malaria along with the standard questionnaire. The data set contains information for both HIV positive and non HIV individuals. The HIV indicator questionnaire is a separate instrument, and for the purpose of this study, both files are merged using Statistical Package for Social Sciences (SPSS) version 21. The study is focused on population which is HIV positive hence by using the option of “select cases” criteria in SPSS, we were able to separate HIV positive cases from the negative one. This gave us a sample size of 839 individuals from an initial sample size of more than 15,000 individuals. Among these 839 individuals there were 79.6 % (668) males and 20.4% (171) females. We divided the variables into two categories reflecting personal and structural barriers. The unavailability of clinical data would not allow us to directly include the third category of clinical barriers into our study.

To better understand the objective of the study, we designed a conceptual framework to distinguish the relationships among different variables in the selected categories.

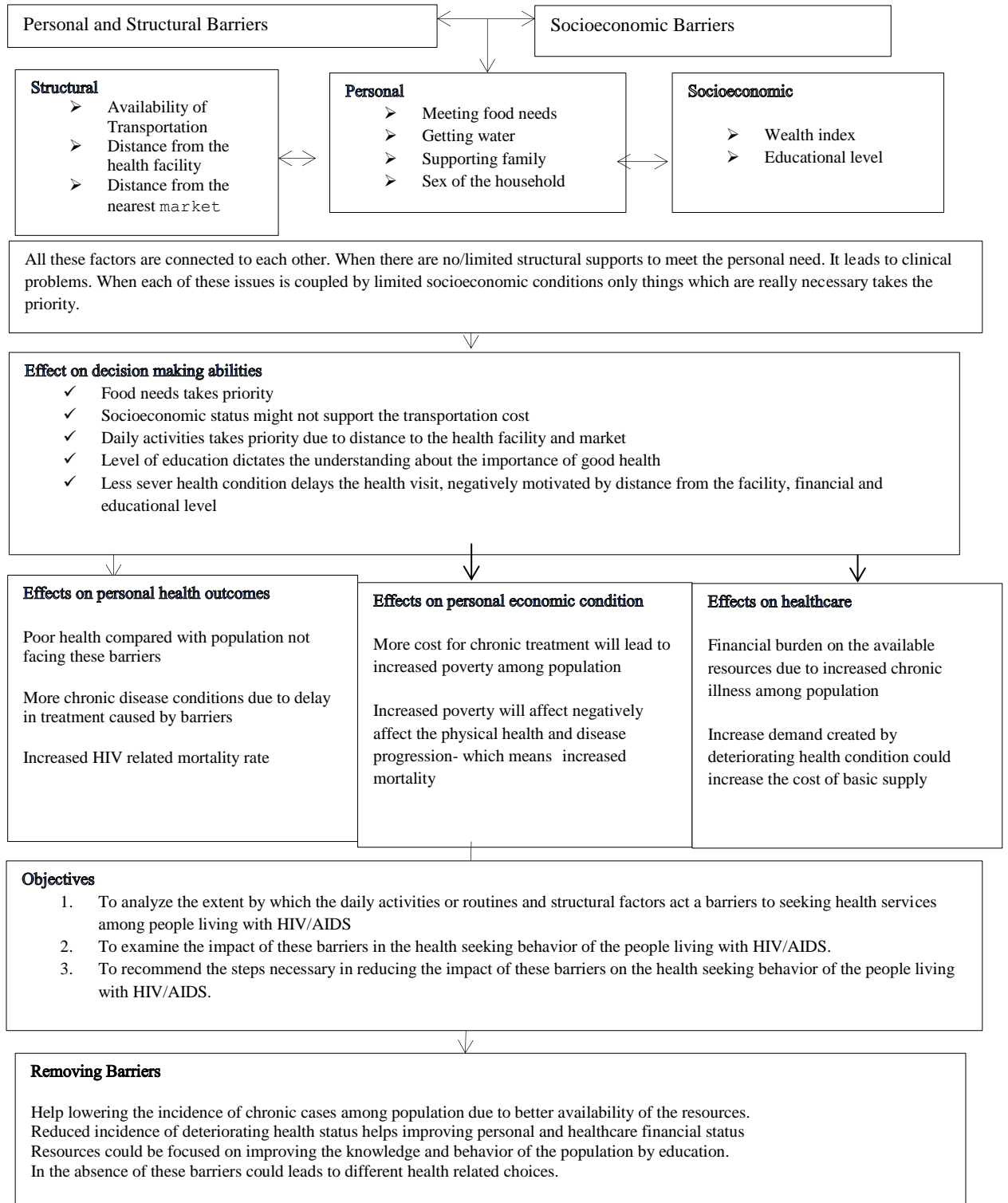


Diagram 1: Conceptual Framework

Patients/subjects in the study

The study subjects are a mix of the both urban and rural settings (type of place of residence) among 839 subject; 21.2% (178) live in the urban settings and 78.8% (661) in the rural settings. Our sample had more representation of the male population (79.6%) compared to females (20.4%).

Data from the DHS were available in two different files as household data and HIV/AIDS indicators. DHS collects the HIV marker/indicators separately. The study is focused on HIV/AIDS positive population. After the initial merging of both files, cases were selected. Only cases with HIV=1 (1, positive and 2, negative) were included in the study. Cases with negative HIV/AIDS results were excluded from the study. After the final 839 cases were identified we further divided the cases with the selection criteria of location (urban, rural). This gave us 178 cases representing the urban population while 661 as the rural sample size. We again sub divided both these files with gender as a selection criteria. We ran the test on these sets and subsets of data getting results for the overall sample for Tanzania and the categorical data provided us the details about the urban and rural population focusing males and females separately.

After studying almost 300 variables for the sample size we excluded the variables which were incomplete and not relevant to our study. We found 27 variables which represented the socio demographic, structural and personal aspect focused in the study. Initially, a descriptive analysis of these variables was done for all the variables.

The second part of the data analysis included the correlation between these variables. Based on the objective of the study, we included the variables for correlation. The correlation test is important in this study as the aim of the study is to see the extent of relationship among these variables. Also in the absence of the clinical data which could have helped as a dependent variable, the correlation gives us the freedom of not differentiating between independent and dependent variables.

The table below includes the list of all the variables included in the first part (descriptive) of the study and then variables from this list that have been selected for the correlations test at the second part of the data analysis. The detailed discussion about these variables is done in the results section of the study.

Table 5: List of the variables included in the study

Region	Has bank account
Type of place of residence	Mainland/Zanzibar
Source of drinking water	Distance to the nearest marketplace (kms)
Has electricity	Location of source of water
Has radio	Number of meals the household has per day
Has television	Number of days the household ate meat/fish in the
Has refrigerator	past week
Has bicycle	Frequency having problems in satisfying the food
Has motorcycle/scooter	needs of the HH last year
Has car/truck	Distance to the nearest health facility (kms)
Type of toilet facility	Means of transportation to the health facility
Sex of the head of the household	Owens land usable for agriculture
Age of head of household	Owens livestock, herds or farm animal
Has telephone (landline)	Has animal- drawn cart
Has mobile telephone	

Part 2 Data Analysis-Correlation and Logistic Regression

We ran the correlation test (Pearson) and Kendall's test to test the degree of relationships between the variables and to test the hypothesis. Based on the aim of the study we wanted to find out if the daily activities have some relationship with the decision to seek health services directly or indirectly. Which means our variables like sex

of the household, educational level, wealth index and difficulty in meeting food needs and type of transportation to go to health facility, source of the drinking water has any association with the distance of the health facility and the nearest market. This was determined by the used of linear regression model using chi square and Pearson test. The data used in our study was combined from two different files. A chi square is a good test to know if the data came from the same population.

We ran the tests to see the overall general trend and then separately by gender (male, female) and the location (urban and rural). This would give us further insight about the effect of barriers in the urban and rural population. Additionally, having a female as a head of the household combined with the educational level would dictate the decision making abilities by different categories.

Findings of the Study

Literature analysis of the different studies showed studies focusing on only one variable including transportation cost (Tuller et al, 2009), stigma (Kumarasamy, 2005, Garumma T Feyissa, Abebe, Gima and Woldie, 2012), and cost of ARV (Crane et al, 2003-04). Based on the literature review we identified the potential barriers which could affect the treatment adherence by interfering the decision making ability and accessibility among the population. The review of literature helped us in deciding among different available variables to group under categories mentioned in the conceptual framework of the study, i.e., structural, personal, clinical and social barriers.

The data analysis has two different sections; first section contains the general descriptive analysis of the variables. This gave us a broader picture of the trends and possible issues among the affected population. Below is results of the first part of the analysis which is descriptive findings.

Table 6: Descriptive Statistics, N=839

Variables	N	%
Sex of the Head of the household*		
Male	668	79.6
Female	171	20.4
Age of the Head of the Household		
18- 30	96	11.4
31-45	352	42
46-60	239	28.5
60 and above	152	18.1
Type of place of Residence		
Urban	178	21.2
Rural	668	78.8
Highest Educational level N 201(women**)		
No education***	18	2.1
Primary	137	16.3
Secondary	42	5.0
Higher	4	0.5
Highest Educational Level N 164(Male**)		
No education***	19	2.3
Primary	103	12.3
Secondary	41	4.9
Higher	1	0.1

*this includes only the head of the house hold who were interviewed there might be more female and males in the household.

**this questions includes all the eligible members of the family hence the total number of males and females in this questions might be different from the total male and females in the interview.

***no education in DHS means that the subjects might not be eligible for the education in case children's are included

Section two of the data analysis includes correlation. Which is to see the relationship among these variables: includes, education, wealth index, sex, distance of the health facility, distance of the nearest market difficulty meeting food needs.

When we look at our sample population the majority (78.8%) represents the rural population in Tanzania. The education level between males and females in rural and urban areas (table 8) shows a difference in the level of educational attainment among these categories. While in urban location both male and females have attained some level of higher education, in rural areas the highest level of education was limited to secondary for both the genders. The table below summarizes the educational level for male and females by location.

Table 7: Educational level of males and females by location

Gender	Urban%	Rural%
Male		
No education	0.6	2.7
Primary	9.6	13
Secondary	9	3.8
Higher	0.6	NA
Female		
No education	0.6	2.6
Primary	20.2	15.3

Secondary	10.1	3.6
Higher	2.2	NA

There is a significant gender difference in the educational level attained by location, females in urban location had better educational under primary (F- 20.2, M-9.6), secondary (F- 10.1, M-9) and higher(F- 2.2, M- 0.6) educational level as compared with the males in the urban location. There is a difference in male and female as a head of the household in terms of their different approach towards the daily activities. Also, this is affected by the earning capacity based on gender. Better education always gives benefit to get better jobs and earnings. There are fewer females in the urban setting who do not have any education (0.6%) while in rural setting the number of females without education is higher (2.6%). Similarly for secondary education, urban setting has higher percentage (10.1%) than the rural (3.6%). Females in urban setting are better off in all four levels of education compare to their rural counterparts.

The experience is different for males. When it comes to “no education” less number of males in urban area fell into no education category (0.6%) while more males (2.7%) in rural area found under “no education” category. However, in terms of primary education more males in rural setting get primary education (13%). Females and males in rural areas have no higher education.

Wealth plays an important role in the living standard, affordability and education attainment among the population. Financial barriers often affect the treatment adherence among HIV positive individuals (Boyer et al, 2009). However the wealth index in the

DHS data does not represent the money, but the assessment of the assets owned by the household: type of house material, household own a land, bicycle, television, mobile phone, and access to water. Wealth index is also important for assessment of the nutritional indicators studies and in this case influences the access to care. We did separate test on the wealth index to compare the differences in rural and urban populations with respect to the distance from the health facility and nearest market in both scenarios.

First, the wealth index of the rural population will be analyzed. The assessment of wealth index is recorded under five categories: poorest, poor, middle, richer, and richest. The table below summarizes the findings for both rural and urban wealth index for the sample population.

Table 8: Comparison of the wealth index among rural and urban population

Categories	Rural%	Urban%
Poorest	30.9	27
Poor	21.2	15.7
Middle	19.1	28.1
Richer	14.1	8.4
Richest	14.8	20.8

Analysis of the above table shows that the larger number of the poorest live in the rural settings. While the difference is not significant between rural (30.9%) and urban (27%), the greater difference is in the middle level of wealth index. Almost 28% of the

people in urban setting fall at middle level compared with almost 19% of the rural population under middle category.

Upon analysis of the wealth index for the female who are the head of the household and its effect on their educational level the results for urban females shows $r(142) = -0.1$, $p < 0.05$, the negative correlation (-0.1) between the wealth index and educational level of the rural female implies that in rural area increase in wealth index is not correlated with higher educational attainment.

Results from rural males who are the heads of the households with their wealth index and the educational level are $r(129) = 0.1$ that wealth index is positively correlated with educational attainment among rural males. However, in general there is no significant correlation between the wealth index and the educational level of the population.

Distance of the health facility and its relation with the different mode of transportation to the health facility was the next criteria. This was established with Pearson's correlation test of significance. To analyze if there is any significant relationship between the distances of the health facility with regards to the mode of transportation to go to health facility we ran a Pearson correlation test of significance. Descriptive statistics show that for the rural location the average distance from the health facility is 4.88 km (a little over 3 miles) and 56.1% of the rural population walks to the health facility. However there was no significant correlation between the distance of the nearest health facility and the mode of transportation used in the rural setting. However in the urban setting where the average distance from a health facility is 1.77km (1.1miles)

showed a significant correlation is $r(178)=-0.216$, $p<0.01$. Additionally, for both urban and rural population combined the effects of the distance of the nearest health facility and the gender of the household is significant at , $r(839)=0.01$, $p< 0.01$, which indicates that female and males takes difference decision to visit health facility when it comes to the distance of the health care center.

The average distance of the health facility is less (1.1miles) in rural areas with better percent of public transportation (14.6%) and almost 19.1% people having access to car/motorcycle Based on the Pearson correlation test results for the distance of the health facility and the mode of transportation we did the multinomial logistic regression model test results in the table below. The results shows that the odds of the people going to the health facility if there is transportation (public transportation) is .061 (table 9) times higher than walking to the health facility at a distance of at least 8 km (5 miles) and the odds of people to go to the health facility when the distance is zero is 1.6 (table 9).

Table 9: Parameter Estimates from multinomial logistic regression

Means of transportation to the health facility ^a	B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence interval for Exp(B)	
							Lower Bound	Upper Bound
Public transportation (bus, taxi) Intercept	-1.109	10.746	.011	1	.918			
Distance from the health facility	.879	10.766	.007	1	.935	2.409	1.651E-009	3516991171.656
Distance from health facility=0km	.839	10.761	.006	1	.938	.432	2.489E-010	624468280.378
distance from health facility=8 km								
Walking Intercept	3.293	5.452	.365	1	.546			
Distance from the health facility								
Distance from health facility=0km	-.227	5.452	.002	1	.967	.797	1.759E-005	3616.793
distance from health facility=8 km	-4.460	5.467	.665	1	.415	.012	2.565E-007	521.104

Meeting food needs is another daily requirement especially with the large families. The data analysis shows the average number of family member in a household is 7. Providing meal for each family member is a big challenge. The data analysis on the relationship between the distance from the nearest marketplace and the difficulties in meeting food need is significant at $r(178) = 0.15, p < 0.5$. . The average distance from the nearest marketplace for the entire sample population is 21.7km (13.5 miles). Though while looking separately the average distance from a market for the rural population is 26.7 km (16.6miles) considering that 57.1% people walk and only 30.3% have bicycles. In contrast the urban population has an average distance of 5.7km (3.5miles) from a nearest marketplace.

Comparing the wealth index with the location of drinking water is another important basic necessity as food. In DHS data location is recorded by the place where the source of drinking water is present for the household. Pearson correlation is significant at $r(839) = 0.01, p < 0.5$. With the better wealth index household would have a better location (in own dwelling, in own yard). This suggests a possible effect of greater distance of the location of the drinking water affecting other activities including going to the health facility for the treatment. DHS measures the location by collecting the information that if the source of water “in own dwelling, in own yard or plot and elsewhere”. There were only 508 responses recorded for this question and more than 91% of those responded had the drinking water located somewhere else. There was no data on the average time spent to go to the water source for this dataset. According to DHS, HIV/AIDS and malaria indicator survey for 2011-12, the average time taken by a household to make a roundtrip to the water source is 30 minutes.

People with compromised immunity need better nutrition in addition to their medications to gain strength to fight against infections. Meals per day is another variable we measured to understand the food difficulties. Access to food could be an additional barrier when it comes to making choices between meeting food needs and going to the healthcare facility. We performed Kendall's tau b test to test this hypothesis/ association between food issues with the various measures of wealth index. This test is used to provide better estimates especially when we do not have the clinical data to do a direct correlation and dealing with non-parametric data. The test separates the data which agrees with each other from the data which disagrees with each other in a data set. The test between ownership of livestock, herds or farm animals with number of days the household ate meat/fish in last week showed a significant correlation (Kendall's tau-b= -0.125, N=836, $p < 0.01$). The correlation between the number of meals household has per day with their wealth index produced these results: Kendall's tau b= -0.093, N=839, $p < 0.01$. The correlation is negative in both the combination of variables; this implies that the people with less or no ownership of livestock would eat meat less frequently. Similarly people with higher wealth index would be eating greater number of meals (more than 2 times) per day. Another test on variable with livestock ownership with frequency having problems in satisfying the food needs of the household last year yielded Kendall's tau b=0.038, N= 833, $p < 0.01$. The testing is supporting of the positive relationship between households ownership of livestock, herds or farm animals with less problems in meeting food needs. Similarly frequency in problem with food need with number of meals showed Kendall's tau b=-0.202, N=835, $p < 0.01$. Two variables are

negatively related which means that the less the problem in meeting food need for the household more number of meals household will eat per day.

Results of the variables (distance from the nearest marketplace with problem with satisfying the food need) with Pearson correlation $r(814)=0.148$, $p<0.01$. The results indicate the positive correlation between these two variables which is the longer the distance from the market more would be the problem in satisfying the food need of the households. The multinomial logistic regression between the distance from the nearest health facility with the number of meals is $OR=6.106$.

Another Pearson correlation between the distance of the nearest health facility with the sex of the household shows $r(833)= -0.93$, $p<0.01$. The correlation is negative which could lead to a possibility that males' and females' decision to go to a health facility is affected by the distance to the health facility

Discussion and Conclusion

Medical advancement has improved the life expectancy for people suffering from many diseases. HIV/AIDS is no exception and with the help of better nutrition, facility, and lifestyle and with effective medication, lives of people with HIV/AIDS can be prolonged. However, this is not universally true when we start analyzing the social structure in various societies. While better nutrition is a way improving the general health of an individual, at the same time everyone faces their own challenges to get better nutrition. This study was conducted to see if there is a relationship between the use of health services, which is an important service when it comes to the treatment, and the daily activities of the household for persons living with HIV/AIDS.

Healthcare providers most of the times mention the importance of continuation of treatment to their patients, but at the same time it is difficult for health providers to understand the challenges faced by their patient towards their treatment regimen. These barriers include transportation facility, cost, distance of the health care facility, distance from the market, difficulties in meeting food need. There are other factors which affect the intensity of these barriers which includes wealth level, educational level, number of family members and the location.

Transportation which is a basic requirement for everyone in developing countries that sometimes have undeveloped structure and cost could be an issue. Our results indicate the mode of transportation when coupled with extended distances affects the frequency with which people visit the health facility. Other studies which examines transportation cost as a barrier has similar results where even with the high motivation level subjects strongly felt that the cost of transportation is a barrier (Tuller et al, 2009) . Our results corresponded in showing a correlation between the means of transportation with the distance of the health facility. Due to the lack of the clinical data we could not directly analyze the clinical outcomes with the barrier. However, analysis shows a correlation between socioeconomic and personal barriers.

The results of this study have shown association between the wealth index of the population with the transportation option, distance from the health facility and market. These results are essential as we are studying a developing country where most people live in the rural area with limited transportation. Most people walk to the health facility or the nearest market. The distance is important because most of these people have large families and meeting their food needs is important. If the patient is the one who contributes to the family financially then distance to the health facility will negatively impact his choice. People who own any land for agriculture would have less issue with food as compared with those with no land. Hence, in absence of the agricultural land people will have to travel to the market and long distances with limited public and personal transportation making this task more complicated. Additionally, we have data showing a little over 8% of the people own a refrigerator, which may imply more frequent trips to the market for fresh produce. This is supporting the hypothesis that when

people with immune compromised status are not going to the health facility due to the barriers (transportation, low wealth index and distance), they are more likely to fall sick than the healthier people. Food insecurity is also consistent with other studies e.g. Maqutu et al. 2011. Rural areas are the most affected especially for people who do not have any source of livestock or agricultural land.

Demographics is another consideration in many studies, however we found that not every barrier can be related to demographics. People living in urban areas with less distance to the health facility showed no better results than people in rural areas with longer distances. Similarly, age did not seem to have any effect when it came to the walking distance to the health facility; however, gender seems to react differently. We did not conduct detailed analysis of male and female's behavior with walking distance to the health facility as this is beyond the scope of our study.

We also have the additional data such as owning a cell phone, television or radio. Due to the limitation of the pre collected data we cannot directly say how much it helps in the informing about the treatment and disease process. Speculation about owning these facilities indicate better wealth index and possibly better education. Our initial theory that individuals living with HIV/AIDS demonstrate different decisions and abilities to seek health services depending on their socioeconomic and clinical factors could not be fully supported in the absence of the data. Patient's age has an association with increase treatment adherence (Maqutu et al, 2011). Data does not present a strong relationship between the educational levels with the wealth index.

Similarly, the results supporting the correlation between an immune compromised status warrant's for more nutrition. Financial difficulties play a crucial role in the treatment adherence (Boyer et al, 2009). HIV medications are expensive and when our population ranges from 18 to 90 years with an average age of 47 years. At this point when extended families live together then supporting the medication is based on the relationship with the head of the household. Results also showed that almost 81% of population does not own any bank account.

Even though there are limitations to the study, but sample size represents 30 regions and 9 zones which give support to the assumptions that the remaining regions would have similar results.

Conclusion

Our study reflects that the people with HIV/AIDS when challenged with everyday activities, including structural and social barriers interfere with treatment and decision to continue treatment. The number of people with HIV is growing every day and developing countries are affected the most. With limited resources and knowledge about the diseases people are likely to give priority to the everyday activities for their family in place of treatment. With HIV being so common it becomes part of life; even with infection life goes on and so are daily the responsibilities.

Food insecurities coupled with financial barriers makes need for medication seem less important. With more efficient use of resources on decreasing the distance between the people and the access to the health care would improve the treatment adherence

among population. Most studies suggest that people are motivated to continue treatment until barriers becomes stronger than their will.

Increasing access by opening healthcare facilities in as many locations as possible would cover more people. Second, mobile health facility is a less expensive choice than creating a new facility.

We cannot force people to continue treatment until they understand the importance of the treatment. Hence empowering people's knowledge with encouraging education among population and media campaign could make a significant difference in compliance of medication treatment. Focusing on the basic needs like food and water by the authorities would ease the burden on the affected households and would allow them to focus more on health care. When people wait to go to the health facility until the condition are severe, it creates an additional burden on the existing healthcare system by creating demand for high end treatments.

Limitations of the study

The study was limited by the non-availability of some variables relevant to this study. Due to the standard changes done in the DHS questionnaire based on the country, the data indicative of the correlation between the barriers and the health outcomes of the population in Tanzania could not be included in the study. However, so far based on the available literature this could be the first of this type of study in Tanzania where structural, personal and social barriers are studied together to understand the reason of not attaining the treatment adherence among HIV/AIDS population despite of free

medication. Missing data on the occupation of the sample population was another limitation to the study.

Future reference

Although the study painted a good picture about Tanzania, there are many questions which could be answered by adding additional information to the present study. This study tried to bring so many variables working at different level to understand the psychology behind the decision making process among people suffering with HIV/AIDS. Despite these barriers, people are always willing to get the cure or prolong their lives whenever possible. Adding clinical information and health care access information would make this study much stronger.

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Abbreviations

AIDS Acquired Immune Deficiency Syndrome

ARV Anti Retrovirus

DHS Demographic and Health Surveys

HAART Highly Active Antiretroviral Therapy

HIV Human Immunodeficiency Virus

