

SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

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**FACTORS INFLUENCING ANTIRETROVIRAL THERAPY (A.R.T)
DEFAULTING AMONG PEOPLE LIVING WITH HIV/AIDS (PLWHIV/AIDS)
AT THE VOLTA REGIONAL HOSPITAL, HO**

BY

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DECLARATION

I hereby declare that the research presented herein is entirely mine which was done under strict supervision. I also hereby declare that careful literature search and avid reading were done and that, due recognition is given to all literature used by citations. This document presented therefore, does not serve the interest of any person or group of persons, neither has it been presented by any other person in this exact form for which it has been written.

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DEDICATION

I dedicate this dissertation to my dear wife, Aleser Euphemia Domegile for offering me all the moral support throughout the study. I also dedicate this to my kids; Toby and Philipa. You guys were sacrificed in pursuit of this academic work, hence deserve all the praises. The love and support shown were deep and all I have is to pray for Gods' continues blessings upon you all.

Last but not the least, I dedicate this to the entire Koku-Anu family; Mum, Dad, and all my siblings for your prayers and pieces of advice throughout those stressful moments.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
ARV	Antiretroviral
CDC	Centers for Disease Control and Prevention
CD4+	Cluster of Differentiation 4, a T-helper cell
CHPS	Community Based Health Planning and Services
GAC	Ghana AIDS Commission
GHS	Ghana Health Service
GSS	Ghana Statistical Service
HIV	Human Immunodeficiency Virus
HTC	HIV Counseling and Testing
MOH	Ministry of Health
NACP	National AIDS/STI Control Programme
OPD	Out Patient Department
OI	Opportunistic Infections
PLWHIV/AIDS	Persons Living with HIV and AIDS
RCH	Reproduction and Child Health
SSA	Sub-Saharan Africa
STI	Sexually Transmitted Infections
TB	Tuberculosis
UN	United Nations
UHAS	University of Health and Allied Health Sciences

UNAIDS	Joint United Nations Programmes on HIV and AIDS (includes UNICEF, UNDP, UNFPA, UNDCP, ILO, UNESCO, WHO, WORLD BANK)
VRH	Volta Regional Hospital
WHO	World Health Organization

ABSTRACT

Background: The introduction of antiretroviral therapy by the global scientific community has been a breakthrough in the fight against Human Immuno-Deficiency Virus and Acquired Immune Deficiency Syndrome. In Ghana, about 195 facilities were said to be rendering Anti-retroviral therapy as at 2015 ending with 119,600 people being put on Antiretroviral medicines. However, defaulting of antiretroviral therapy by patients on medication, remains a threat to this otherwise successful health intervention.

Objective: This study aimed at assessing the factors that influence Anti-retroviral therapy defaulting by People Living with Human Immuno-Deficiency Virus and Acquired Immune Deficiency Syndrome at the Volta Regional Hospital.

Methods: The study applied a cross sectional design using a structured questionnaire (quantitative method) to collect data from 190 simple random sampled participants attending the antiretroviral therapy centre for analysis. Descriptive analysis was run to obtain proportions and frequencies for all categorical variables observed in this study. The outcome variable (Anti-retroviral therapy defaulting) was categorized into a binary variable (yes or no). Chi-square and multiple logistic regression analysis were used to establish relationship between Anti-retroviral therapy defaulting and the independent variables. Multiple logistic regression analysis was run to adjust for confounders significance level was set at $p < 0.05$.

Results: The ART defaulter rate was 56.8%. Generally, some health facility, one community related factor, economic factors and patient related factors were found to have some influence on ART defaulting ($p < 0.05$). Various reasons were attributed for defaulting. For instance, 18.4% said they were too busy, while 4.7% said they felt better and did not want to go for treatment again. These were all found to have significant association with Anti-retroviral therapy defaulting ($p < 0.05$). Culture, a community related factor was found to have a strong influence on defaulting ($p < 0.05$). about 54.1% of respondents attributed defaulting to the long waiting hours they spend at the service site: OR = 0.02; 95 % CI = [0.001, 0.49]; $p < 0.05$) and food insecurity (OR = 0.97; 95 % CI = [0.46, 2.06]; $p < 0.05$), also had a significant association with ART defaulting. Education also had some significant association with Anti-retroviral therapy defaulting ($p < 0.05$).

Conclusion/Recommendation: Various reasons contribute to ART defaulting. These include spending long hours at the clinic, financial constraints, too busy for hospital appointment and cultural beliefs. It is therefore, recommended that service providers send reminders to clients to remind them when their appointment dates are approaching. Facility should institute more ART clinic days to avert the crowding and waiting for long hours at the ART clinic sites. More adherence counselling should be done throughout the treatment period.

TABLE OF CONTENTS

DECLARATION.....	i
DEDICATION.....	ii
ACKNOWLEDGEMENT.....	iii
LIST OF ABBREVIATIONS	iv
ABSTRACT.....	vi
LIST OF TABLES	xiii
LIST OF FIGURES	xiv
DEFINITION OF TERMS.....	xv
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background to the study	1
1.2 Problem Statement	2
1.3 Justification of the Study	5
1.4. Objectives of the Study.....	9
1.4.1. General Objective	9
1.4.2. Specific Objectives	9
1.4.3. Research Questions.....	10
1.5 Outline of Dissertation.....	11
CHAPTER TWO	13
LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK.....	13
2.1 Introduction.....	13

2.2 HIV/AIDS	13
2.2.1. Life Cycle of HIV	14
2.2.2 Burden of HIV/AIDS.....	15
2.3 Anti-Retroviral Therapy (ART).....	16
2.3.1 Quality of ART Care for PLWHIV/AIDS	17
2.4 ART Defaulting	17
2.5 Factors Influencing ART Defaulting	18
2.5.1 Community Factors Influencing ART Defaulting.....	18
2.5.2. Patient Factors Influencing ART Defaulting	21
2.5.3 Socio-Demographic characteristics	23
2.5.4. Healthcare Provider Factors Influencing ART Defaulting	24
2.5.5 Socio-Economic Factors Influencing ART Defaulting.....	26
2.6 Conceptual Framework of Factors Influencing ART Defaulting Among PLWHIV/AIDS.....	29
CHAPTER THREE	33
RESEARCH METHODS.....	33
3.1 Introduction.....	33
3.2 Study Design.....	33
3.3 Study location	34
3.4 Study population	35
3.4.1 Inclusion criteria	35
3.4.2. Exclusion criteria	36
3.5. Sampling strategy.....	36
3.5.1. Sample size determination	37
3.6 Variables	37
3.6.1 Dependent variable (ART Defaulting).....	38
3.6.2 Independent variables	38

3.7 Data Collection Method/Approach	38
3.8 Data Analysis	39
3.8.1. Multiple Logistic Regression	40
3.9. Quality assurance	41
3.9.1 Pre-test of Questionnaire.....	41
3.10 Ethical considerations	41
3.11 Chapter Summary	44
CHAPTER FOUR.....	45
RESULTS	45
4.1 Introduction.....	45
4.2 Socio-Demographic characteristics of participants	45
4.3 ART defaulting among PLWHIV/AIDS	46
4.4 Assessment of Patient-related factors	47
4.5 Assessment of health-facility related factors	48
4.6 Assessment of community-related factors	50
4.7 Assessment of economic-related factors.....	52
4.8 Chi-Square Tests: Relationship between ART defaulting and sociodemographic characteristics.....	54
4.9 Multiple logistic regression: Relationship between ART defaulting and sociodemographic characteristics	54
4.10 Chi-Square Tests: Relationship between ART defaulting and patient-related factors.....	56
4.11 Chi-Square Tests: Relationship between ART defaulting and health facility-related factors.....	57
4.12 Multiple logistic regression: Relationship between ART defaulting and facility-	

related factors.....	57
4.13 Chi-Square Tests: Relationship between ART defaulting and community-related factors.....	58
4.14 Chi-Square Tests: Relationship between ART defaulting and economic-related factors.....	59
4.15. Multiple logistic regression: Relationship between ART defaulting and economic-related factors.....	60
4.16. Chapter summary.....	61
CHAPTER FIVE	62
DISCUSSION OF RESULTS	62
5.1 Introduction.....	62
5.2 ART defaulting	62
5.3 ART defaulting and sociodemographic factors	63
5.4 ART defaulting and patient-related factors.....	63
5.5 ART defaulting and facility-related factors	64
5.6 ART defaulting and community-related factors	65
5.7 Relationship between ART defaulting and economic-related factors	66
5.8 Summary of the chapter	67
CHAPTER SIX	68
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	68
6.1 Introduction.....	68
6.2 Summary of the study	68
6.3 Conclusions of the study.....	69
6.3.1 Influence of socio-demographic characteristics on ART Defaulting	69

6.3.2 Influence of facility-related on ART Defaulting	70
6.3.3 Influence of community related on ART Defaulting	70
6.3.4 Influence of economic related factors on ART Defaulting.....	70
6.4 Contribution to Knowledge.....	71
6.4.1 Contribution to Policy	71
6.4.2 Contribution to Management of healthcare institutions / ART Centres	72
6.4.3 Contribution to Methodology	72
6.5 Recommendations.....	73
6.6 Limitations to the study	74
6.7 Future Research	74
REFERENCE	75
APPENDICES	80
APPENDIX A: Participant Information Sheet	80
APPENDIX B: Informed Consent Form	83
APPENDIX C: QUESTIONNAIRE FOR ART PATIENTS	86

LIST OF TABLES

Table 4.1: Socio-demographic characteristics of participants	46
Table 4.2: Assessment of health facility-related factors	49
Table 4.3A. Assessment of community-related factors	51
Table 4.3B. Assessment of community-related factors	52
Table 4.4: Economic-related factors	53
Table 4.5. Chi-Square Tests: Relationship between ART defaulting and sociodemographic characteristics	54
Table 4.6: Multiple logistic regression: Relationship between ART defaulting and sociodemographic characteristics	55
Table 4.7. Chi-Square Tests: Relationship between ART defaulting and patient related factors.....	56
Table 4.8. Chi-Square Tests: Relationship between ART defaulting and health facility–related factors.....	57
Table 4.9: Multiple logistic regression: Relationship between ART defaulting and health facility-related factors	58
Table 4.10. Chi-Square Tests: Relationship between ART defaulting and community-related factors.....	59
Table 4.11. Chi-Square Tests: Relationship between ART defaulting and economic-related factors.....	60
Table 4.12: Multiple logistic regression: Relationship between ART defaulting and economic-related factors.....	61

LIST OF FIGURES

Figure 2.1: Life Cycle of HIV. Source: (AIDS info, 2016).....	15
Figure 2.2: Conceptual Framework of Factors Influencing ART Defaulting Among PLWHIV/AIDS.....	32
Figure 3.1: A map showing Ho Municipality within the Volta region of Ghana	35
Figure 4.1: ART defaulting among PLWHIV/AIDS at the Volta Regional Hospital	47
Figure 4.2. Assessment of Patient Related Factors.....	48
Figure 4.3: Assessment of community-related factors.	50

DEFINITION OF TERMS

Anti-retroviral therapy (ART): Anti-retroviral therapy is the use of antiretroviral medicines to treat persons with HIV/AIDS. It involves the combination of medicines (Anti-Retroviral Drugs) to reduce or suppress the viral load in the person's blood.

ART Defaulting: It was explained as clients missing of hospital appointment date by one day or more. Thus, clients who come a day or more after the appointment date had defaulted (Operational Definition).

Loss to follow: Loss to follow is used to describe those default/miss hospital appointment for more than 90 days or who could not be traced because they never returned to care after defaulting.

Experienced clients were referred to those who had been on ART for more than a year.

Inexperienced clients were referred to those on therapy for less than a year

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Human immunodeficiency virus (HIV), the virus that causes acquired immune deficiency syndrome (AIDS) is one of the world's most serious health and development challenges (UNAIDS, 2017). Globally, over 37 million people are said to be living with HIV (UNAIDS, 2017). A vast majority of these persons can be found in countries with low and middle income status with Sub-Saharan Africa being the most affected (UNAIDS, 2017). About 19.5 million of these people living with the disease were on therapy as of 2016, which is an increase from the 17.1 million in 2015 (UNAIDS, 2017). In fact, the past few years have seen an improvement in access to Antiretroviral Therapy (ART), especially in resource-limited countries in Africa, Asia and South America (Kranzer *et al.*, 2010).

In Ghana, the provision of ART in public health care started in 2003, with two facilities serving as pilot sites in the Manya Krobo District (NACP, 2016; World Health Organization, 2015). A lot more facilities are now rendering ART services because the National AIDS Control Programme has been scaling up the provision of Highly Active Anti-Retroviral Therapy since 2003 (Clive, Asante, Lamptey, & Atuahene, 2011). The Ghana AIDS Commission and the Ghana Health Service also see expansion of access to ART as a major goal. For instance, as at 2011, about 150 health facilities were said to be providing ART to more than 60,000 patients, which is seen as an increase from below 5,000 just within six years before that period (Sabin *et al.*, 2014). The number of

treatment sites as at 2015 ending was 195 with 119,600 people receiving therapy. That number has since increased with about 376 sites currently rendering ART service in the country (NACP, 2018).

The provision of ART is aimed at reducing HIV related morbidity and mortality, suppression of viral replication, enhancement of the immune function, promotion of growth as well as improvement in the quality of life of the individual (NACP, 2016). Since its inception, ART has led to more clients living long (Penn, Watermeyer, & Evans, 2011). Their quality of lives have also improved and people now see HIV/AIDS as a treatable disease just like any other chronic disease (Penn *et al.*, 2011).

1.2 Problem Statement

Anti-retroviral therapy is the use of antiretroviral medicines to treat persons with HIV/AIDS (NACP, 2016). It is always part of a comprehensive care package that also come with the provision of counseling and testing as well as prevention of mother to child transmission, management of sexually transmitted infections and opportunistic infections (NACP, 2016). It is a lifelong activity that requires some unique strategies to make it effective and help forestall the development of resistance to the medicines (NACP, 2016). Just like in most countries in Sub-Saharan Africa, retention of clients after initiation of therapy, remains a challenge (Miller, Ketlhapile, Rybasack-Smith, & Rosen, 2010). It has been suggested that, about 70-80% of patients in Ghana continue treatment after 12 months of initiation of therapy, which is similar to what pertains in most other resource constraints countries (Sabin *et al.*, 2014). A number of research in

some Sub-Saharan African Countries point to some factors as reasons for non-continuation of therapy (Kagee *et al.*, 2011).

Despite the successful introduction of ART services in Ghana, studies have indicated that the fight against HIV is fraught with some challenges, with ART defaulting by clients being the major concern (Clive *et al.*, 2011). Clive *et al.* (2011), alluded that ART defaulting over 5% could have serious damage on the scaling up of ART service in Ghana. These researchers also asserted that there could be serious impairment on the impact of ART thereby affecting clients' recovery if defaulting continues. These analysts argued that more toxic and costly second line regimens with more side effects could be forced on clients. Buttressing their point about the consequences of ART defaulting, these researchers explained that the long-term benefits could be eroded with some 10 to 20% of investment in ART going into the drain because of non-adherence to therapy. The argument is that persistent ART defaulting could lead to development of resistant strains of the virus (Clive *et al.*, 2011).

Kip, Ehlers, and Van Der Wal (2009), conducted a situational analysis of patients' adherence to anti-retroviral therapy in Botswana. These analysts realised that inadequate knowledge of ART, stigma, travelling cost; waiting time and side effects of medications were some of the patient centered factors that could contribute to ART defaulting. Kip *et al.* (2009), also identified some health facility or service related factors to be having some influence on ART defaulting. They stated some of the service related factors as providers' attitude and knowledge, the inability to do home visiting and contact tracing,

and delays in getting some services. This assertion is becoming an issue in most public health institutions (Kagee *et al.*, 2011). It is therefore, worrisome since health facilities are supposed to render quality service in a very professional manner.

In a similar vein, Clive *et al.* (2011), also indicated some factors contributing to ART defaulting in the Eastern Region of Ghana to be patient related. Financial problem was identified as the main reason why people defaulted. These researchers found that most people had either lost their jobs or were unemployed and such clients struggled to fend for themselves (Clive *et al.*, 2011). It was reported that 38.6% of ART patients had no regular jobs and hence, had no regular income. Patients on therapy ought to have a deeper understanding of what ART is about. This will invariably make them understand the benefits of remaining in therapy (Boateng, Kwapong, & Agyei-Baffour, 2013). In a more recent work, Sabin *et al.* (2014), cited education as one of the factors that could contribute to defaulting similar to what was indicated in earlier studies (Clive *et al.*, 2011). Interestingly, clients' indication of little knowledge of specific roles of ART in viral suppression is seen as quite problematic and worrying (Sabin *et al.*, 2014). Other reasons such as food insecurity, location of client, lack of support, among others, were all identified as contributing to ART treatment default (Clive *et al.*, 2011).

The socio-cultural setting in Africa requires that people show concern and support to the vulnerable in society, including the sick (Clive *et al.*, 2011). Sadly, for PLWHIV, the society tends to shun them when they are identified (Clive *et al.*, 2011). The stigma surrounding their condition makes it possible for people to neglect them (Clive *et al.*,

2011). A study conducted in Zimbabwe revealed that defaulting was associated with lack of social support from both partners and the society (Ester, 2015). This assertion had earlier on been corroborated by other researchers where some patients defaulted because of fear of stigma and family pressure, if they found out (Miller *et al.*, 2010). In Ghana, similar works in other regions suggest that societal reasons could be associated with defaulting (Clive *et al.*, 2011; Sabin *et al.*, 2014). Reports from these researchers have cited stigma, discrimination and lack of social support as some reasons associated with defaulting.

Ghana is currently, adopting the World Health Organisation (W.H.O) policy of 90:90:90, which is aimed at ensuring that by 2020, at least, 90% of people living with HIV would have known their status; with at least, 90% being on treatment; and 90% developing viral suppression (GAC, 2017; The U.S. President's Emergency Plan for AIDS Relief, 2016). Achieving these targets will however, be a mirage if defaulting continues to increase. Checks from the Volta Regional Hospital ART unit for instance, indicated that defaulting had always been an issue. Clients continue to default, and the situation seems to be on the increase despite all the adherence counseling that precedes initiation of therapy. Informal discussions with workers showed that the situation was assuming alarming dimensions.

1.3 Justification of the Study

Following the successful introduction of ART services in Ghana in 2003, there has not been much research on defaulting in ART clinic appointment, especially for a place like the Volta Region, which was found to have 2.4% of national HIV prevalence in the 2016 HIV sentinel Survey (GAC, 2017). Though similar work was done in the Eastern Region,

the socio-cultural dynamics could differ from other regions - reasons for defaulting could be different from other regions (Clive *et al.*, 2011). Another driving factor behind this study was the fact that defaulting of clinic appointments by PLWHIV/AIDS has not been properly explored in previous studies.

At the Volta Regional Hospital in Ho, patients are put on medication after some assessments and adherence counseling are done. During this period, patients are educated about the condition, the treatment regimens, side effects as well as the benefits for being on medication. They are also implored not to miss their appointment dates because of the other services that are rendered to them on ART clinic days. However, some problems still arise because of noncompliance, leading to defaulting in clinic appointments. It continues to record high default cases. Missing clinic appointments may not be a major problem. However, continue defaulting in clinic appointment could eventually lead to medication non-adherence (VRH, 2017).

The economic factors that have been attributed to ART defaulting should be a case for concern because income level affects every sphere of people's daily lives, including those living with HIV/AIDS. Service charges at ART clinics are more likely to cause people to default (Clive *et al.*, 2011). It becomes more worrying if unauthorised charges are established as the causes of clients' refusal to visit the clinic. Tentatively, the issue of economic factors has been found in other research to have influenced defaulting in other parts of the country (Clive *et al.*, 2011; Sabin *et al.*, 2014). However, this same assertion cannot be confirmed to be so in the Volta Regional Hospital since the dynamics may be

different. It is for this reason that this research was conducted to determine whether defaulting at the said facility was due to economic reasons.

It is believed that patients who discontinue with care after few months, do so because of the lack of knowledge of the benefits of ART services (Boateng *et al.*, 2013; Sabin *et al.*, 2014). Other issues that make them do so are the time on therapy, side effects and the impacts of ARVs (Clive *et al.*, 2011). It is therefore, imperative that such a study was conducted to see how these factors were consistent with literature. Findings from the research would also help proffer some suggestions to help find solutions to address the challenges.

Health facility related factors that influence patients to access services ought to be improved if ART and other services are to be rendered without any mishaps (Boateng *et al.*, 2013). This suggests that patient confidentiality will have to be assured always. It also requires that staff develop good rapport with their clients while providing all the necessary information as well as being available all the times (Boateng *et al.*, 2013). This research therefore, sought to establish how some of these issues could influence ART clients in meeting hospital appointments at the Volta Regional Hospital. Other health facility issues that are expected to be touched on as far as ART defaulting is concerned are the waiting time and the poor relationship between clients and health staff. Failure to establish these issues as having influence on ART patients' defaulting at the Volta Regional Hospital means the problem will persist. As part of helping find solutions to these issues, it was important that a study of this nature was carried out to either confirm

or otherwise.

Cultural practices and other community factors such as stigma/discrimination and lack of support have been cited in literature as having an influence on ART defaulting (Campbell, Nair, Maimane, & Nicholson, 2007). However, it is essential that this assertion was investigated to establish whether indeed such factors were the main reasons why clients were defaulting at the Volta Regional Hospital. For fear of being ridiculed and discriminated against, ART clients are sometimes reluctant to seek treatment from facilities where they could be seen and recognised by known persons. Such clients will not open up because of accompanying shame and embarrassment (Campbell *et al.*, 2007). The belief by others in the society that HIV/AIDS is associated with witchcraft is a myth that ought to be demystified. A research like this therefore, was to help to erase that erroneous impression and false beliefs from community members about HIV/AIDS (Campbell *et al.*, 2007).

The choice of this location (Volta Regional Hospital, Ho) was motivated by the fact that it is the biggest referral center in the region and serves clients from various parts of the region. It also records patients from all walks of life, including Togo and Benin (Volta Regional Hospital, 2016). The high number of patients accessing health care at this facility makes it the ideal place for such a research to be conducted.

Since ART is currently the best bet when it comes to prolonging the lives as well as ensuring quality of life of people living with HIV/AIDS (PLWHIV/AIDS), it was

therefore, important to identify some of the factors that could influence clients/patients to default. The focus of this study was therefore, to assess the various factors that could influence defaulting. Another reason for this study stemmed from the fact that the researcher is a health worker. His years of service with the health sector of Ghana would help in presenting in-depth analysis of the problem at hand.

1.4. Objectives of the Study

The objectives of the study have been divided into two namely; general and specific as have been explained below.

1.4.1. General Objective

The general objective of the study was to assess the factors influencing defaulting of ART among PLWHIV/AIDS at the Volta Regional Hospital (VRH), Ho.

1.4.2. Specific Objectives

The specific objectives were:

1. To identify sociodemographic factors that influence ART defaulting among PLWHIV/AIDS at VRH.
2. To explore health facility related factors influencing ART defaulting among PLWHIV/AIDS at VRH.
3. To investigate community related factors influencing ART defaulting among PLWHIV/AIDS at VRH.

4. To assess patient (medical) related factors influencing ART defaulting among PLWHIV/AIDS at VRH.
5. To examine economic factors influencing ART defaulting among PLWHIV/AIDS at the VRH.

1.4.3. Research Questions

The questions that helped to get answers to respond to the specific objectives were

1. Which sociodemographic factors influence ART defaulting among PLWHIV/AIDS at VRH?
2. Which health facility-related factors influence ART defaulting among PLWHIV/AIDS at VRH?
3. Do community-related factors influence ART defaulting among PLWHIV/AIDS at VRH?
4. What patient (medical) related factors influence ART defaulting among PLWHIV/AIDS at VRH?
5. Which economic factors influence ART defaulting among PLWHIV/AIDS at the VRH

1.5 Outline of Dissertation

The first chapter of this dissertation gave a brief background to the study and explicitly stated what the problem was before justifying the need to conduct such a study. The study objectives and research questions were also stated in the chapter one.

Chapter two presents review of some studies in relation to the subject matter of this study. In this chapter, some literatures are reviewed to establish how ART defaulting is influenced by certain factors based on findings from studies elsewhere. The chapter also conceptualizes some of the factors that could possibly influence ART defaulting among PLWHIV/AIDS at the study location. It categorizes these factors into Patient related factors, Health facility related, community related as well as economic related factors. This chapter also explains what Anti-Retroviral Therapy is, as well as the operational definition of ART defaulting.

Chapter three presents the various methods and approaches that were used to collect empirical data for analysis. The chapter looks at the design of the study, the location, study population, sampling strategies, quality issues, data collection and organisation, data analysis and all other issues like the ethical considerations including, funding, compensation as well as the risks and benefits of the study.

Chapter four presents the results of the study. The main findings of the study are presented and highlighted. These results are presented in the form of frequency tables and

bar charts after using statistical instruments like chi square and logistic regressions to do the analysis.

Chapter five discusses the results and findings. It also gives interpretation of the results and discusses the association between the various factors and ART defaulting. It tries to relate the findings and results with other authors opinion.

Chapter six concludes the work and proffers some recommendations to policy makers to see how defaulting could be prevented. Highlights of some the limitations of the research can also be found in this chapter. It also outlines some of the things that could be done to help address some challenges in ART services in the country. The chapter also touched on some contributions of the study to policy, knowledge and methodology

CHAPTER TWO

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Introduction

This chapter presents review of studies in relation to the subject matter of this study. It is divided into sections.

2.2 HIV/AIDS

Human Immunodeficiency (HIV) is a virus that attacks the immune system, which is the human natural body's defense system (CDC, 2011). The immune system made up of various cells, including the T-helper cells (CD4 cells) are usually the target of HIV when one gets infected. It does this by invading the CD4 cells and destroys them rapidly while making copies of itself. As the CD4 cells reduce, the HIV cells increase until such a point that the immune system is destroyed (CDC, 2011). Acquired Immune Deficiency Syndrome (AIDS) can be described as an advanced form of HIV infection since it is caused by the virus HIV (CDC, 2011). People do not get AIDS, but rather HIV (CDC, 2011). AIDS is therefore, a set of symptoms and illness that develop because of advanced HIV infection, which destroys the immune system. Although there is no cure for HIV/AIDS, with the right treatment and support, people can live long and healthy just like any other form of disease (CDC, 2007).

2.2.1. Life Cycle of HIV

The CD4 cells, otherwise known as the helper T-cells are the main white blood cells that are responsible for defending the body against any diseases and infections (AIDSinfo, 2016). These cells have numerous receptors on their cell surfaces, which serve as source of attachments for the HIV upon infection. It does this by using HIV glycoprotein in a process called binding. The next stage is by fusing itself with the host cell membranes with the subsequent release of capsid into the cytoplasm of the CD4 cell and this is known as fusion (AIDSinfo, 2016). The next stage involves the conversion of an RNA (which is found inside the virus into a viral DNA and that stage is known as the reverse transcriptase (AIDSinfo, 2016).

With the help of an integrase enzyme, the viral DNA then migrates into the CD4 cell's nucleus and integrates itself into the DNA of the CD4 cell (AIDSinfo, 2016). It is at this stage that more copies of the viral integrated DNA are made whenever the DNA of the CD4 cells replicates (AIDSinfo, 2016). Replication, which is synonymous with most cells lead to production of proteins for survival (AIDSinfo, 2016). These HIV proteins then become the building blocks for more HIV as these together with the viral RNA move into the surface of the cell and assemble into immature HIV (noninfectious). These immature HIV cells then push out of the host cells using the host cells glycoproteins (AIDSinfo, 2016). This mechanism occurs with the help of a protease enzyme, which puts together pieces of proteins that are needed to form complete infectious virus (AIDSinfo, 2016). The virus then undergoes maturation and begins to infect nearby healthy CD4 cells while the previously infected CD4 cells die off after a while. Figure 2.1 shows the life cycle of HIV.

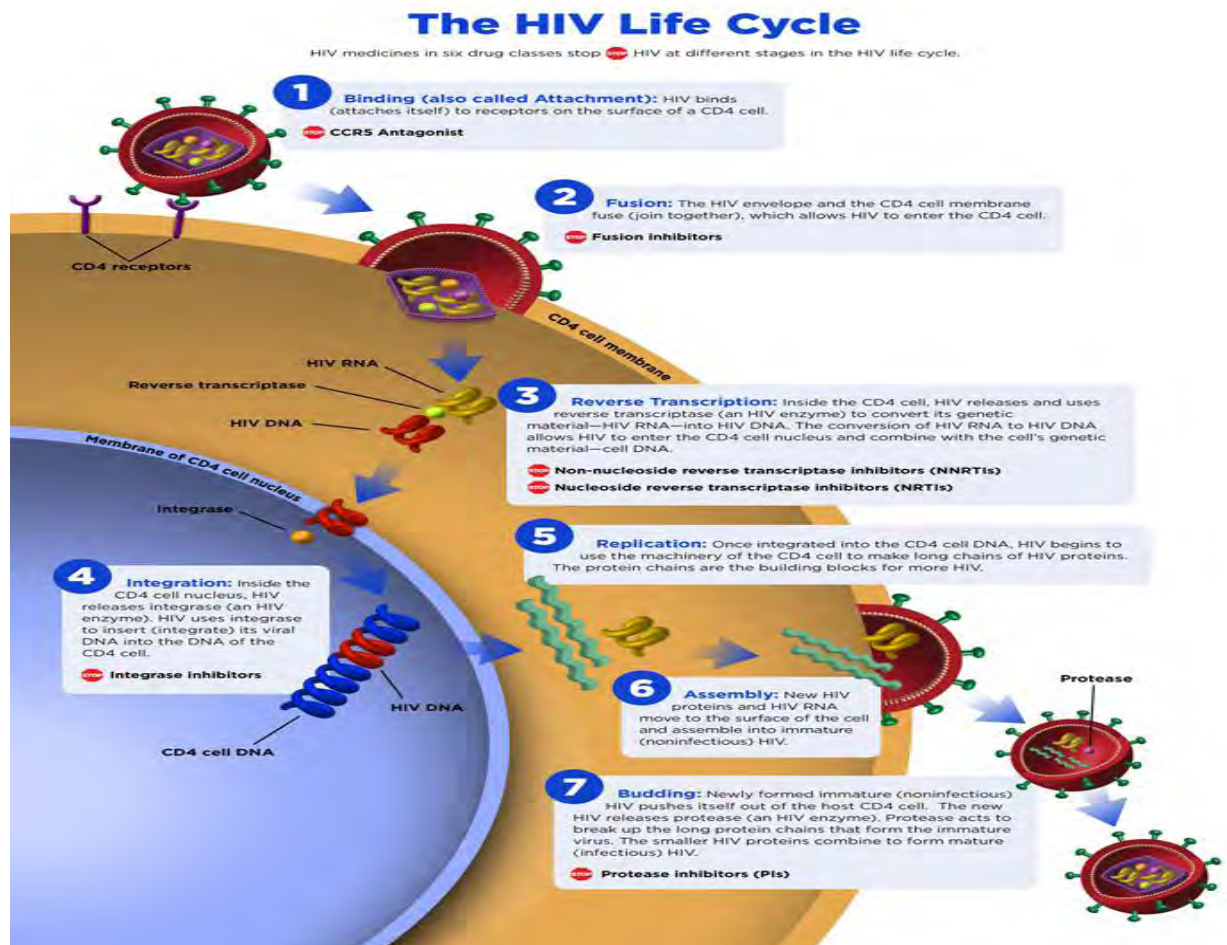


Figure 2.1: Life Cycle of HIV. Source: (AIDS info, 2016).

2.2.2 Burden of HIV/AIDS

The global picture of HIV/AIDS as at 2016, indicated that more than 36.7 million people were living with the disease with about 1.8 million new infections, which is a decline from the 2.1 million in 2015 (UNAIDS, 2017). Global prevalence is 0.8% among adults (UNAIDS, 2017). With an estimated figure of about 78 million infections since the inception of the epidemic, 35 million deaths from AIDS related illness have been recorded. Reports show that new infections among children have been reduced to about

47% (160,000).

This is more than half the figure that was recorded in 2010 (UNAIDS, 2017).

In Ghana, since the first case of the disease was recorded in 1986, incidence has been increasing (GAC, 2017). The current national prevalence stands at 2.4% with Brong Ahafo and Volta Regions having the highest of 2.7% while the Northern Region is having the lowest of 0.7% (GAC, 2017). The disease is firmly established within the general population though sub groups at high risk may disproportionately contribute to the spread of HIV (GAC, 2017). For instance, the prevalence among the young population (15-24) remains 1.1%, prevalence among the age group of 45-49 years was however, recorded as the highest, 5.6% (GAC, 2017). The report showed that HIV sub-type 1 had the highest proportion of 98.5% compared to 1.5% for dual HIV type 1 and 2 infections in 2016. There was however, no infections of HIV sub-type 2 (GAC, 2017).

2.3 Anti-Retroviral Therapy (ART)

Anti-Retroviral Therapy (ART) is the use of medicines to treat HIV/AIDS (WHO, 2017). It involves the combination of medicines (Anti-Retroviral Drugs) to reduce or suppress the viral load in the person's blood. Imran and Nasir (2015), explained that though the medicines used in ART do not cure the disease, it significantly slows down the growth of the virus. There have been efforts to ensure that ART services become affordable, especially to people in low to middle income countries (World Health Organization, 2017). By so doing, the progression of the disease is curtailed (World Health Organization, 2017). It is said that more than 19.5 million people were on treatment as at December 2016 and that deaths resulting from HIV related causes had reduced to about 1.1 million in 2015. This figure represents about 45% reduction since 2005 (World

Health Organization, 2015).

2.3.1 Quality of ART Care for PLWHIV/AIDS

With the growing population of PLWHIV on ART, it is anticipated that, the target of reaching 30 million set by the global community by 2020 is very likely (UNAIDS, 2017). Generally, the quality of care for PLWHIV has improved over the years with more people now getting better. The evidence of viral suppression after continuous use of ARVs emphasizes the importance of ART care (UNAIDS, 2017). The management of opportunistic infections (OIs) has contributed to better care for people living with HIV/AIDS. These were hitherto regarded as the major cause of deaths among PLWHIV before the early 1990's. opportunistic infections (OIs) are usually the initial indicator of most HIV/AIDS infections (AIDS Info, 2017). Clinicians and other health care staff must therefore, be very knowledgeable of these OIs and develop strategies to prevent and manage them when they arise. Other co-morbid conditions like TB, Hepatitis are all better managed. There is also the special management and considerations for pregnant women in the form of PMTC (AIDS Info, 2017).

2.4 ART Defaulting

McGuire *et al.* (2010), define „defaulting“ as missed last appointment by more than 1 month among PLWHIV/AIDS. This definition was corroborated by Kranzer *et al.* (2010), who explained defaulting as having stopped all ART drugs for more than 30 days. These researchers also explained that „treatment interruptions“ are people who defaulted for various reasons and later returned to treatment. Another term, „loss to follow“ is used to describe those who could not be traced because they never returned to care after

defaulting (Kranzer *et al.*, 2010). In fact, different authors have different definitions and explanations of defaulting (Ester, 2015). This is because defaulting was originally coined and used in Tuberculosis control and management where clients who missed their medicines for 30 days or more were classified as defaulters (Ester, 2015). This word has since been applied in HIV management since the inception of ART (Ester, 2015).

However, to avoid any form of doubt and ambiguity and ensure clarity, defaulting will be explained as any client who misses “his/her last hospital appointment by one day or more. At the VRH, clients are either given two weeks, one month, two months or three months appointments depending on their clinical indicators and whether they are old or new clients. Appointment dates for clients are not merely for medication refill, but also meant for their clinical assessment, adherence counselling and certain laboratory investigations (VRH, 2017). Defaulting should therefore, be a source of concern to all stakeholders.

2.5 Factors Influencing ART Defaulting

Various factors have been suggested to be associated with defaulting and below are some of them.

2.5.1 Community Factors Influencing ART Defaulting

This section presents analysis of studies conducted on how community related factors could contribute to defaulting among PLWHIV/AIDS.

Culture/Religion

Some cultural factors have been noted to have an influence on ART defaulting (Clive *et al.*, 2011). Clive *et al.* (2011), report that some people visit their traditional priests for consultation where local treatments are first employed. Closely tied to this factor is the religious faith of some people. Certain religious faith requires that people fast at certain periods of the year, months or even days and such people would naturally not take their medicines during such periods (Clive *et al.*, 2011).

In a cross sectional study to determine factors influencing adherence to ART in Nepal, religion and culture were identified as some of the barriers to people not adhering to their medications (Wasti *et al.*, 2012). Wasti *et al.* (2012), indicated that people should abide by their local traditional and religious beliefs. For instance, fasting is considered a requirement in both Hindu and Islam, hence, people are more likely to miss their medication (Wasti *et al.*, 2012). This assertion was supported by some analysts who unearthed barriers to ART care in India (Joglekar *et al.*, 2011). Joglekar *et al.* (2011), posited that attending to some social and cultural events by families and friends are major events that must not be missed. These researchers observe that during such periods, patients are forced to miss appointment dates and hence, lead to defaulting.

Stigma/Discrimination

Some studies suggest that ART adherence is influenced by the material, symbolic, relational and institutional contexts in which ARV users live as well as the patient's

motivation, participation and psychosocial responses to ART (Skovdal *et al.*, 2011). Treves-Kagan *et al.* (2015), did a situational analysis, involving a rapid, community-based qualitative assessment to inform a combination of HIV prevention programme in high prevalence communities. These researchers suggested that anticipated stigma remained a barrier to care. They found that although participants reported less enacted stigma or hostility toward people living with HIV, they also felt that HIV remained synonymous with promiscuity and infidelity. These analysts observed that participants described community members taking steps to avoid being identified as HIV-positive, including avoiding healthcare facilities entirely, using traditional healers, or paying for private doctors. They also argued that such behaviours could lead to delays in testing and accessing care, and problems adhering to medications, especially for men and youth with no other health condition that could plausibly account for their utilization of medical services.

Support from relatives

Literature suggests that lack of support is one of the reasons why people default in ART (Kunutsor *et al.*, 2010). Kunutsor *et al.* (2010), argued that attendance would be affected if support from relatives was not forthcoming. They also added that the support from relatives would help clients to keep track of appointment days, serve as a morale booster and such relatives could even help pick up medications during ill health. These researchers then concluded that patients who lack support would most likely default.

2.5.2. Patient Factors Influencing ART Defaulting

There are certain patient factors that could contribute to ART defaulting among PLWHIV/AIDS (Kip *et al.*, 2009). Kip and associates (2009), assessed some of the factors influencing patients' anti-retroviral therapy (ART) adherence at four clinics in Botswana. They found that patient-centered barriers to ART adherence included inadequate knowledge of ART, human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS), CD4 cell and viral-load results, stigma, travelling costs, waiting times at clinics, side effects of ART, use of traditional (indigenous or folk) medicines, and abuse of alcohol. Therefore, these analysts concluded that ART adherence required more than free ART and suggested that adherence levels would improve if both patient-centered and service-centered barriers were addressed.

Confirming this view, other researchers concluded that providing access to ART alone would not end HIV-related stigma (Treves-Kagan *et al.*, 2015). Treves-Kagan *et al.* (2015), posited that individuals will remain hesitant to seek care as long as they fear that doing so would lead to prejudice and discrimination. To buttress their point, they contended that it was critical to combat this trend by increasing cultural acceptance of being seropositive, integrating HIV care into general primary care and normalising men and youths' accessing health care. However, other studies indicate that ART adherence is influenced by the patient's motivation, participation and psychosocial responses to ART (Skovdal *et al.*, 2011).

ARV's Side Effects

Some studies suggest that ARV's side effects have an influence on ART defaulting (Dahab *et al.*, 2008). Clive *et al.* (2011), also asserted that side effects of ARVs were some of the reasons why people defaulted in their medications. Though this was not cited as a main reason for defaulting, it was reported as having some influence on patients taking their medicines. In an earlier study, side effects of medicines were seen as a major barrier that negatively affected adherence to ART (Kip *et al.*, 2009). Kip *et al.* (2009), therefore, concluded that adherence counseling should be properly done to ensure that clients do not default mid-way into their therapy.

Time on ARVs

Closely related to the ARV side effect is the long periods that clients have to take their medications (Kranzer & Ford, 2011). In a study to explore the factors associated with ART defaulting in Eastern Region of Ghana, the length of time on ARVs was identified as one of the reasons why people defaulted (Clive *et al.*, 2011). It was revealed that clients were more likely to default in the early years of initiating ART compared to those on therapy for longer years.

ARV's Impact

According to Clive *et al.* (2011), feeling of wellbeing as a result of the impact of ARVs can lead to defaulting. Rehle *et al.* (2010), asserted that there was the assumption that the initial impact of ARVs could make some people to stop taking their medication. They suggested the need to do more adherence counseling to avoid this belief.

2.5.3 Socio-Demographic characteristics

Some socio-demographic factors have also been attributed to ART defaulting including age, sex, education and marital status (Clive *et al.*, 2011). Clive *et al.* (2011), note that people of younger age are those likely to default. This argument had earlier on been championed by other analysts who indicated that younger clients were more likely not to take their medicines (Wakibi, Ng'ang'a, & Mbugua, 2011).

Sex

The sex of patients has also been cited as a factor contributing to defaulting (Sabin *et al.*, 2014). Sabin *et al.* (2014), reported that challenges faced by men and women when accessing therapy are not the same. They contend that women are particularly, more financially constrained than their men counterparts and hence, are not able to raise money to travel for ART services.

Education

In terms of education, Clive *et al.* (2011), reported that it has no significant influence on ART defaulting. Sabin *et al.* (2014), however, suggest that general knowledge of HIV and the specific role of ART in reducing the viral level is still a challenge in ensuring adherence to therapy.

Marital status

The issue of marital status has also been considered as a factor contributing to ART defaulting (Clive *et al.*, 2011). Clive *et al.* (2011), observe that single women are more

likely to default compared to the married ones. They attributed this probably to the lack of social cohesion and support that exist among married people. Sabin *et al.* (2014), argue that financial constraints are worse for clients who are widowed or divorced since such people usually struggle to get support from others.

2.5.4. Healthcare Provider Factors Influencing ART Defaulting

This section provides analysis of some of the healthcare provider factors that could contribute to ART defaulting among PLWHIV/AIDS.

Appointment/clinic days

One issue of concern is the appointment or clinic days given to ART clients for refill (Kagee *et al.*, 2011). In a prospective study to determine the association between clinic attendance and adherence to ART, it was reported that some social activities of patients had significant impact on visiting clinic for medication refills (Kunutsor *et al.*, 2010). Kunutsor *et al.* (2010), found that appointment days that coincided with social activities were usually not honored, calling for the need for trusted family members to pick medicines for them.

Staff Attitude

Some healthcare provider factors, including attitudes could influence defaulting of ART (Kip *et al.*, 2009; Treves-Kagan *et al.*, 2015). For instance, some studies found that the service-centered barriers include nurses' attitudes and knowledge, health workers' inability to conduct home visits and to contact defaulters, limited clinic hours, delays in getting CD4 and viral-load results (Kip *et al.*, 2009).

Siting of ART clinic

Another factor that has been linked to defaulting is the location of the ART clinic (Kagee *et al.*, 2011). Kagee *et al.* (2011), were of the view that facilities that were located far from the communities made it difficult for patients to get there on monthly basis. At the facility level, the location and siting of the ART clinic has also been found to influence defaulting (Lubaga *et al.*, 2013). In a qualitative study to establish reasons why clients on PMTC service in Eastern Uganda defaulted, it was identified that exposed and isolated nature of the clinic had some influence (Lubaga *et al.*, 2013). Lubaga *et al.* (2013), therefore concluded that integrating the services of ART with other regular outpatient services would help reduce the stigma and subsequent defaulting.

Waiting time

One other factor that has been suggested to influence defaulting is the waiting time at the ART clinic (Clive *et al.*, 2011). This was corroborated by another study, which also cited the volume of work as a challenge in reducing waiting time on some clinic days (Lettow, Bedell, Mayuni, & Mateyu, 2014). Lettow *et al.* (2014), in their analysis of how to eliminate mother to child transmission of HIV, observed that there was an association between larger patient numbers and keeping them on therapy. That is to say that waiting increased with more patients being attended to by few staff (Lettow *et al.*, 2014).

This observation was found to be consistent with other studies, which suggested that waiting time was a major determinant in ART defaulting (Hardon *et al.*, 2007). For instance, Hardon *et al.* (2007), reported that long waiting time was a challenge in some

public health facilities in Uganda, Tanzania and Botswana. The mean waiting times were recorded as 5 hours, 4 hours and 5 hours respectively for these countries. These hours were long enough to discourage people from visiting such facilities again (Hardon *et al.*, 2007).

Logistics availability

Logistical issues have also been cited as some of the reasons behind defaulting of ART (Miller *et al.*, 2010). Miller and associates (2010), in attempting to find out why ART treatment patients were lost to follow up, reported that patients decided not to go to hospitals because of loss of some paper materials like clinic cards, transfer papers and proof of travel. Another logistical challenge that was identified was the cumbersome referral and transfer system. They therefore, concluded that there was the need for new policy intervention to help prevent some of these logistic issues as they were being used as barriers for not going to the clinic. Hansana *et al.* (2013), in their cross sectional survey to measure the adherence level to ART in Lao, identified shortage of medication as a reason for defaulting by some patients.

2.5.5 Socio-Economic Factors Influencing ART Defaulting

Some socio-economic factors that could contribute to defaulting among PLWHIV/AIDS have been explained below.

Income

Financial constraints have been cited in so many research as being a factor that could influence ART defaulting (Kunutsor *et al.*, 2010). Kunutsor *et al.* (2010), indicated that this was a main reason for missed visits for refill. Other research findings support this assertion (Kagee *et al.*, 2011). Kagee *et al.* (2011), reported that poverty was a major hindrance to clients accessing therapy because of difficulty in raising money for transport and other miscellaneous expenses on clinic days. A similar study in the Eastern Region of Ghana found that lack of money was the over racking factor for defaulting (Clive *et al.*, 2011). Clive *et al.* (2011), reported that 62.4% of patients and 66% of health professionals all agreed that money was a main reason for defaulting. They therefore, recommended that user charges for ART be removed. In a related study, it was found that about 80% of patients cited lack of money as the main reason for defaulting (Sabin *et al.*, 2014). Sabin *et al.* (2014), indicated that financial constraint made it difficult for clients to access therapy because they had to pay for medicines and use some of their money as transportation to the clinic.

Some studies have linked poverty and unemployment with HIV/AIDS patients (Ibrahim, Anderson, Bukutu, & Elford, 2008). (Ibrahim *et al.*, 2008) examined the economic and social status of people living with HIV/AIDS in North London and found that most people living with the disease faced economic hardship as a result of unemployment. According to these researchers, such people struggled to earn meaningful income to cater for their health needs. They therefore, concluded that policy makers should give priorities to the issue of tackling poverty and unemployment among people living with HIV/AIDS

(Ibrahim et al., 2008). Similarly, a study in the Eastern Region of Ghana revealed that some people lost their jobs upon disclosing their HIV status (Damtse, 2016).

Transport Cost

Closely linked to income is the cost of transportation (Tuller *et al.*, 2010). In a qualitative research with patients on ART in south western Uganda, these researchers identified transportation cost as a key barrier to accessing ART services. Together with other factors like food, they indicated that patients struggled to meet clinical appointments on monthly basis because of difficulty in raising funds to go to the clinic. To address this barrier, they suggested that interventions needed to be introduced to help sustain ARV adherence (Tuller *et al.*, 2010). Long distance to the clinic may be a barrier to patients accessing ART because of inability to raise money for transportation (Skovdal *et al.*, 2011). Kagee *et al.* (2011), also reported in their study that people were not motivated to go for ART services when clinics were far from patients' place of residence. They argue that if facilities are too far, poor clients who usually walk to such facilities will most likely default.

Food insecurity

In a qualitative study conducted in Uganda, Tanzania and Botswana, food security/insecurity was cited as a factor that influenced ART defaulting (Kagee *et al.*, 2011). Kagee *et al.* (2011), indicated that patients had difficulty taking their medicines because of the extra appetite that come with the use of the ARVs. Because of the insecure nature of their meals, it was indicated that clients preferred taking their medicines only when they had food readily available.

2.6 Conceptual Framework of Factors Influencing ART Defaulting Among PLWHIV/AIDS

Based on the earlier discussed factors influencing ART defaulting, the conceptual framework of the study was developed as depicted in figure 2.2. In this framework, the outcome variable is Antiretroviral Therapy (ART) defaulting by clients living with HIV/AIDS on medication. The independent or exposed variables are grouped into four main broad areas. The first one is a combination of two factors: medical related or patient factors. The medical related factors together with the patient factors could individually affect ART directly or influence each other as depicted in the framework. For instance, the medical related factors such as the side effects of medicines, and the length of time of taking the medication could be de-motivating if proper adherence counseling is not done at the ART center by service providers. The absence or presence of clinical symptoms plays major roles in determining whether to continue with therapy or not. Individual perception of the positive impact of the ARVs could deceive clients to believe that they are healed due to no clinical symptoms and hence, suspend their medications.

The patient related factors also have another component known as the socio-demographic factors (age, sex, education, marital status, religion and distance to facility). These factors could play a major role in determining the outcome; thus, the ART defaulting. Being young or elderly may have an influence on clients' continuing with therapy. The health seeking behaviours of men are quite different from that of women. Women tend to be more concerned with their health than their male counterparts and are less likely to default than men (Cheater & Marshall, 2005).

The educational level of clients could also be a factor contributing to ART defaulting since educationally enlightened clients are more likely to know the consequences of defaulting than the illiterate clients. In certain communities where, married women are not allowed to travel or go out without their husbands' consent, accessing ART could be problematic if the client is a female. For some time now, religion has had a major influence on health care seeking behaviour (Wasti *et al.*, 2012). Faith healing is gradually rearing its neck in every aspect of health care for people who believe and practice it and it is more likely to determine whether clients continue with ART or resort to spirituality (Clive *et al.*, 2011; Wasti *et al.*, 2012). Patients are also likely to discontinue with ART if they will have to cover long distances to access therapy (Kagee *et al.*, 2011; Skovdal *et al.*, 2011).

The second factor that is also likely to affect ART defaulting is the socio-economic situation of the client. The variables that can bring about this include the cost of traveling to health facilities, income of the client as well as the security or uninterrupted food feeding of the client. The poor are more likely to struggle with their daily upkeep, let alone get a three-square meal; and this can influence their decision to default.

The relationship between culture/customs cannot be underestimated when it comes to accessing health care in some societies (Wasti *et al.*, 2012). In certain societies, travelling on some specific days is considered a taboo; hence, making appointment days to coincide with such days are more likely to see patients not going for therapy (Wasti *et al.*, 2012). The stigma, the discrimination and general neglect that PLWHIV/AIDS suffer in societies are some of the main factors that could affect continuation of therapy. Where

support from families and friends is not forthcoming, clients will not be motivated enough to continue with therapy.

At the facility level, poor staff attitude and lengthy waiting period could discourage clients from accessing treatment. The idea of having special clinic days for PLWHIV/AIDS with regular appointment days may not also be pleasing to clients since such regular visits on such days could raise eyebrows and make people suspect them. Facility designs and siting of the ART centre sometimes with directional signs may make any client uncomfortable when visiting, for fear of being identified by known people. All these factors in one way or the other, are inter related and could affect each other or have direct effects on defaulting. Finally, some national policies like the availability of logistics, including medicines and other health care commodities may lead to clients either continuing or discontinuing with therapy. Similarly, the use of WHO's (2016), clinical staging to decide whether to initiate therapy or not may also influence clients' decision to either default or not.

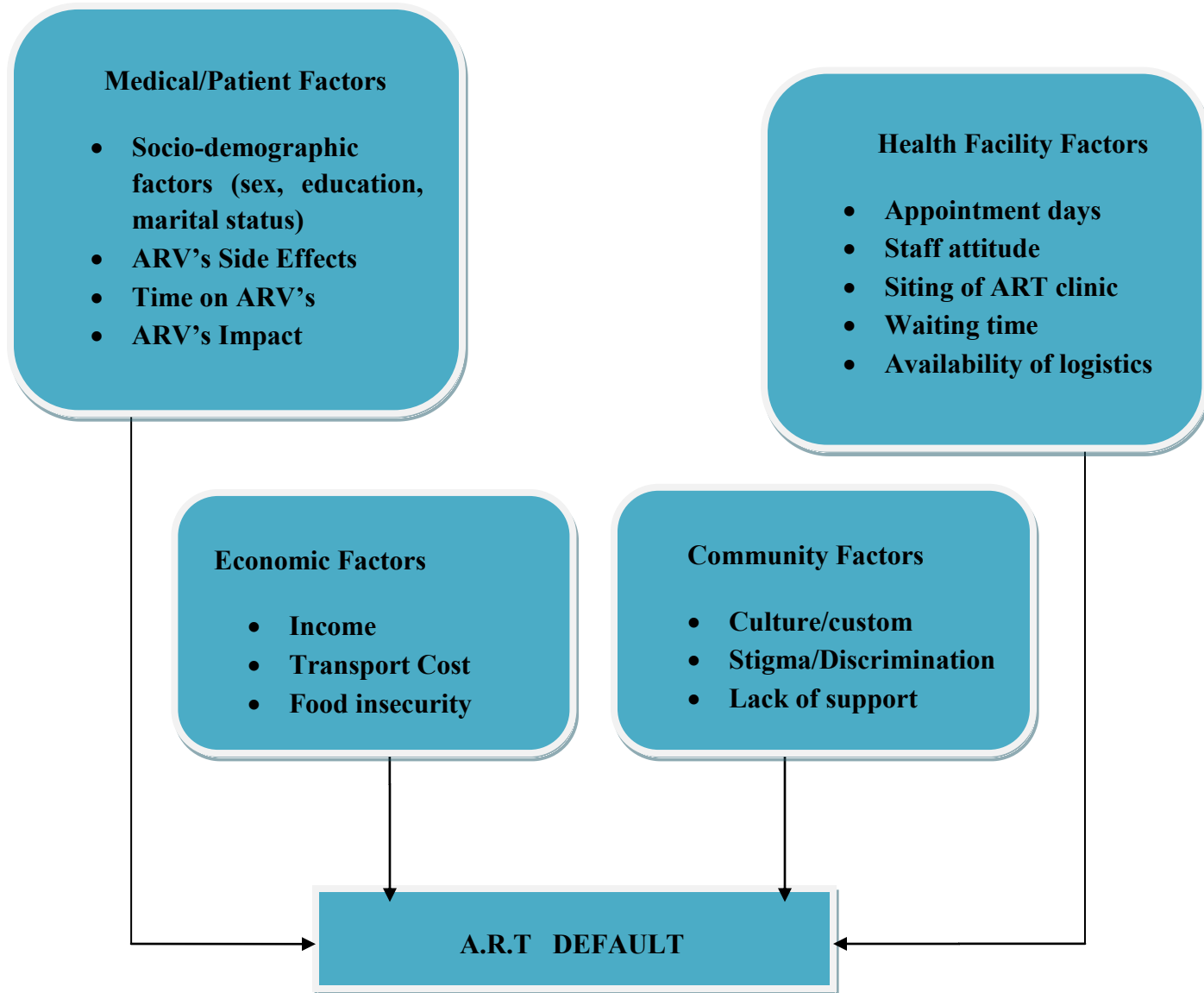


Figure 2.2: Conceptual Framework of Factors Influencing ART Defaulting Among PLWHIV/AIDS.

2.6. Chapter Summary

This chapter has analysed studies on the concepts underlying the study, which also formed the basis of the conceptual framework. The next chapter presents the methods for data collection.

CHAPTER THREE

RESEARCH METHODS

3.1 Introduction

This chapter presents the measures and approaches that were employed in gathering data for analysis in this research. It focuses on the study design, study location, study population, sampling strategies, data collection and organisation, data analysis and all other issues like the ethical considerations. The chapter summary has also been presented.

3.2 Study Design

The study design was a cross sectional descriptive study that used quantitative research method to collect empirical data. This has been explained below. Quantitative method was used to collect data since it is a research method, which is based on quantifying the problem by ways of generating numerical data or data that can be transformed into usable statistic (Muijs, 2010). Muijs (2010), explains that quantitative methods are normally used to quantify attitudes, opinions or other defined variables. It involves sampling from a large population to determine an outcome, which serves as a representation of the entire population. It has the advantage of being able to provide immediate answers to some questions. Another advantage of this method arises from the fact that it enables researchers to convert phenomena that do not naturally appear in a quantitative form into quantitative data and analysed statistically (Muijs, 2010). It however, has the disadvantage of not being able to unearth or uncover the real reasons behind complex situations. Another disadvantage is that; it requires expert statistical analysis of data before results can be made meaningful.

3.3 Study location

The study was conducted at the Volta Regional Hospital in the Ho Municipality. The Ho Township serves as the capital to not only the municipality, but also the entire Volta Region. According to the 2010 population and housing census, the municipality constituted about 8.4% of the nation's population (GSS, 2014). It also has a sex ratio of 89.7/100 (ratio of female to male) and a General Fertility Rate (GFR) of 74.7 per 1000 female population (GSS, 2014). It can be described as an urban municipality because it has a high urban population of about 62% (GSS, 2014).

The 2016 annual performance review showed that the Ho township and the municipality in general was blessed with many health facilities like the Regional Hospital (to be upgraded into a teaching hospital), a municipal hospital, a polyclinic, some private clinics as well as many health centers and Community Based Health Planning and Services (CHPS) compounds (Volta Regional Health Directorate, 2016).

It also has a public university, University of Health and Allied Sciences (UHAS), a technical university, a nursing training college and quite a number of second cycle institutions (GSS, 2014). The 2016 HIV Sentinel Survey (HSS) puts the region joint highest with HIV/AIDS prevalence at 2.7% (GAC, 2017). The other region to have chalked this unenviable feat is the Brong Ahafo Region (GAC, 2017). The choice of Ho and the regional hospital was therefore, apt since it is the biggest referral centre in the region. The hospital is an ultra-modern 240 bed capacity with an average daily outpatient department (OPD) attendance of 420 (Volta Regional Hospital, 2017). Geographically, it is also centrally located in the region. Figure 3.1 shows the map of the Volta Region.



Figure 3.1: A map showing Ho Municipality within the Volta region of Ghana

Source: Ghana Districts (2017).

3.4 Study population

Primarily, the study population was all People Living with HIV and AIDS (PLWHIV) on ART accessing healthcare at the Volta Regional Hospital.

3.4.1 Inclusion criteria

The following criteria were applied to select and include the study participants. These selected participants were those willing to partake in the study.

1. All adult HIV patients (18 years and above) who were accessing ART service at the VRH for the past three years.
2. The cut-off point was to cater for both experienced and inexperienced clients.

3.4.2. Exclusion criteria

1. All adult HIV patients (below 18 years) who were accessing ART service at the VRH.
2. Adult HIV patients assessing ART at the VRH for the past three years who were very sick or those who did not consent to partake in the study

3.5. Sampling strategy

Simple random sampling was used to gather the quantitative data through the administration of questionnaires to those who met the inclusion criteria. Considered as the most widely used, it is a sampling strategy where by each unit in the population has an equal chance of being included in the sample (Teddle & Yu, 2007). In random sampling, the chance of being selected has no influence on the selection of other units (Teddle & Yu, 2007). It has the advantage of ensuring that there is accuracy of representation. It is also considered as easier to use compared to other probability methods of sampling. It is however time consuming which is a disadvantage (Teddle & Yu, 2007). For this research, names of clients who met the inclusion criteria were randomly selected using a computer program (random number generator). These clients were approached on clinic days and their consent sought before administering the questionnaires to them. The immediate next client on the list was interviewed in place of those who declined to partake in the study.

3.5.1. Sample size determination

A similar study carried out by Clive *et al.* (2011), in the Eastern Region of Ghana, recorded a default rate of 13%. Based on this, the sample size was calculated as:

$$n = \frac{(Z_{\alpha})^2 p(1-p)}{d^2} \quad (\text{Cochran, 1963})$$

n = Sample size

Z = Reliability co-efficient which is 95% confidence level

P = default rate from other literature

d = error of tolerance which is 0.05

Substituting these values in the formula,

$$N = \frac{(1.96) (1.96) (0.13) (0.87)}{(0.05) (0.05)}$$

$$= \frac{(3.8416) (0.1131)}{0.0025}$$

$$= 173.$$

Adding 10% for margin of error, the final figure was 190. Hence, 190 PLWHIV/AIDS who were on ART at the VRH were used in the quantitative study.

3.6 Variables

The study measured some variables, and these have been divided into dependent and independent as indicated below.

3.6.1 Dependent variable (ART Defaulting)

ART defaulting was the main outcome variable measured. It was explained as clients who missed their last hospital appointment dates by one day or more. Thus, clients who come a day or more after the appointment date had defaulted. The above definition however, was not applied to “loss to follow up” clients who would have missed their last hospital appointment by more than 90 days.

3.6.2 Independent variables

The other variables/factors (Independent) that were found from literature to be associated with ART defaulting were also assessed. These are;

1. Patient (medical) factors: ARV’s side effects, length of time on medication, poverty, ARV’s impact as well as the demographic factors: age, sex, education, marital status, religion.
2. Health provider (facility) factors: facility design, logistic availability, appointment/clinic days and service provision.
3. Community factors: culture/custom, discrimination/stigma and lack of social/relative support.
4. Economic factors: income, transport cost and food insecurity.

3.7 Data Collection Method/Approach

Quantitative data were collected through administration of close ended questionnaires. These were administered to consented ART clients at the VRH. These clients responded to questions on some of the factors that influence patients to default in their hospital

appointments. The questionnaire was designed to cover four main areas including, economic related factors, patient related, health facility related and community related factors. Data on client demographic factors were also captured in the questionnaire. That is, the questionnaire was divided into sections. Section A asked questions relating to socio-demographic characteristics/patient factors. Section B asked questions relating to patient factors/ ART side effect. Section C asked questions relating to health provider (facility) factors. Section D asked questions relating to community related factors. Section E asked questions relating to economic factors influencing ART defaulting (see Appendix C for the questionnaire). The questionnaire was adapted from earlier studies (Clive et al., 2011; Lincoln, 2016).

Data were collected between June and July 2018 and this was conducted with the help of research assistants, some of whom were health staff at the Volta Regional Hospital. Most of the questions had „yes“ or „no“ answers, hence, an average of 25 minutes was required to complete each questionnaire.

3.8 Data Analysis

The completed questionnaires were coded before entering into Microsoft excel. Data from the Microsoft excel was transferred to Stata Version 15 for cleaning, merging and analysis. Cleaning of the data was done by running frequencies of the variables. This checked inconsistently coded data. Inconsistently coded data were double checked with raw data from the questionnaires. Descriptive analysis were run to obtain proportions and frequencies for all categorical variables observed in this study. These were presented in

the form of tables and charts.

The outcome variable (ART defaulting) was categorized into a binary variable (yes or no). This method was used in previous studies (Clive et al., 2011; Lincoln, 2016). Chi-square followed by multiple logistic regression analysis was carried out to establish relationship between the ART defaulting and the independent variables (sociodemographic/individual factors, health facility-related factors, community-related factors and economic related factors). The multiple logistic regression analysis was run to adjust for confounders. A confidence interval of 95% was used to show significant relations between the dependent and the independent variables.

3.8.1. Multiple Logistic Regression

Regression analysis is a set of statistical processes that are used to estimate the relationships among variables. More specifically, these regressions techniques are used to model and analyze the relationship between a dependent variable and one or more independent variables. Multiple regression attempts to model the relationship between two or more explanatory variables and a response variable by fitting a linear equation to observed data (Sperandei, 2014). It is similar to linear regression analysis except that the outcome is dichotomous (e.g., success/failure or yes/no or died/lived). Regression analysis helps understand how the typical value of the dependent variable changes when one of the independent variables is adjusted and others are held fixed. Multiple logistic regression analysis applies when there is a single dichotomous outcome and more than one independent variable (Sperandei, 2014). Its use in this analysis was influenced by the

fact that it is able to deal with dependent variables that are dichotomous and categorical.

3.9. Quality assurance

The research assistants were trained to enable them gain knowledge of data collection and the administration of the questionnaires. The questionnaire was translated from English to the spoken local language (Ewe or Twi) of the respondents depending on their level of formal educational attainment. The reason was to ensure that questions asked were well understood by the respondents. An independent person was then engaged to do a back to back translation. This ensured that the information was accurate. All data collected were cleaned before using them for analysis.

3.9.1 Pre-test of Questionnaire

This questionnaire used was first pre-tested at the Volta Regional Hospital. The consent of some ART clients at the Hospital were sought before administering the questionnaire to them. This enabled the researcher to identify and resolve all issues concerning clarity on some of the questions.

3.10 Ethical considerations

Activities that ensured that ethical issues were addressed have been explained below.

Ethical Approval

Since the study was conducted at a Ghana Health Service facility, ethical clearance was

sought from the Ghana Health Service Ethics Review Committee.

Permission /Approval from study area

Permission was also sought from the management of the Volta Regional Hospital to use the ART centre.

Description of study subjects

The study subjects for this research were all adult humans who are living with HIV/AIDS and were accessing ART services at the Volta Regional Hospital.

Participants' Consent

Informed consent was sought from all participants before engaging them in the study. This was done in both verbal and written forms. Translation of the consent information was done for those who could not read and write. Those who consented to partake in the study were made to either sign or thumbprint on the consent form.

Voluntary consent/withdrawal

Participants were informed about the purpose and the nature of the research. Using an interpreter, this information was translated into the local Ewe dialect for those who could neither read nor write. Consenting to partake in the study was purely on voluntary basis. In addition, these participants were informed about their right to withdraw from the study if they so desired. Participants also had the right not to answer any question they felt uncomfortable with.

Anonymity and Confidentiality

Clients/patients involved had their identities masked by using special codes to identify them. Thus, no names were used. Strict confidentiality was enforced, and this was explained to participants.

Potential risk/benefit

The risks and benefits of the research were explained to the participants. They were told about how the study could bring out findings and recommendations that could influence policy decisions in rendering ART services to them. When implemented, these policies and recommendations could help improve service delivery to all PLWHIV. The emotional risks that the study could provoke were explained to all participants. That aside, the study did not pose any risk or harm to any participant.

Data storage and usage

Data collected were used purely for this academic research. Some unique numbers were assigned to all questionnaires during data collection and data were destroyed by researcher after using them to do the statistical analysis. No one else had access to this data.

Compensation

Researcher was not financially sound to provide any form of monetary compensation to

participants and this was explained to all participants. However, researcher could provide drinking water to participants who complained of thirst in the cause of the interview.

Protocol Amendment

In seeking for ethical approval, it was stated that the Ghana Health Service ethical review board would be notified accordingly if there would be any amendments or changes with the method or study location, during the research.

Declaration of Conflict of interest

I hereby declare that the researcher had no interest whatsoever in the design, method of sampling, collection of data, findings and the analysis of the data.

Funding information

The investigator was the sole financier of the study. The researcher had no financial support from any organization/institution.

3.11 Chapter Summary

This chapter has presented the methods that were applied to select study participants, study site and primary data for subsequent analysis. The next chapter presents the results of the study.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter presents the findings of the study in accordance with the stated objectives and research questions. The chapter is in six sections. Section one presents demographic characteristics of the respondents. Section two, three and four describe the patient-related factors, health facility-related factors, community-related factors and economic-related factors that influence ART defaulting respectively. Section five presents the relationship between sociodemographic characteristics and ART defaulting among PLWHIV/AIDS at the Volta Regional Hospital (VRH).

4.2 Socio-Demographic characteristics of participants

Table 4.1 presents results of the sociodemographic characteristics of the participants. Most 119 (62.6%) of the participants were females. More than one-third, 67 (35.3%) were in the age group (41-50) years while the least 30 (15.8%) were in the age group (18-20) years. Half, 95 (50.0%) of the participants were married. More than one-third 63 (33.2%) of the participants had Senior High School level education while the least 13 (6.8%) had tertiary education. Majority, 158 (86.2%) of the participants were Christians. Additionally, more than half, 101 (53.2%) of the participants were self-employed.

Table 4.1: Socio-demographic characteristics of participants

Variable	Frequency (145)	Percent (%)
Sex		
Male	71	37.4
Female	119	62.6
Age (years)		
18-20	30	15.8
31-40	52	27.4
41-50	67	35.3
Above 50	41	21.6
Marital status		
Single	33	17.4
Married	95	50.0
Widow	34	17.9
Divorced /separated	28	14.7
Educational level		
None	28	14.7
Primary	40	21.1
JHS	46	24.2
SHS	63	33.2
Tertiary	13	6.8
Religion		
Christian	158	86.2
Moslem	15	6.2
Traditionalist	13	7.6
No religion	4	2.1
Occupation		
Unemployed	47	24.7
Public servant	22	11.6
Private sector	20	10.5
Self-employed	101	53.2

4.3 ART defaulting among PLWHIV/AIDS

Figure 4.1 shows results of ARVs defaulting among PLWHIV/AIDS at the Volta Regional Hospital. Overall, more than half, (56.8%) of the PLWHIV/AIDS defaulted (missed at least one of previous appointments).

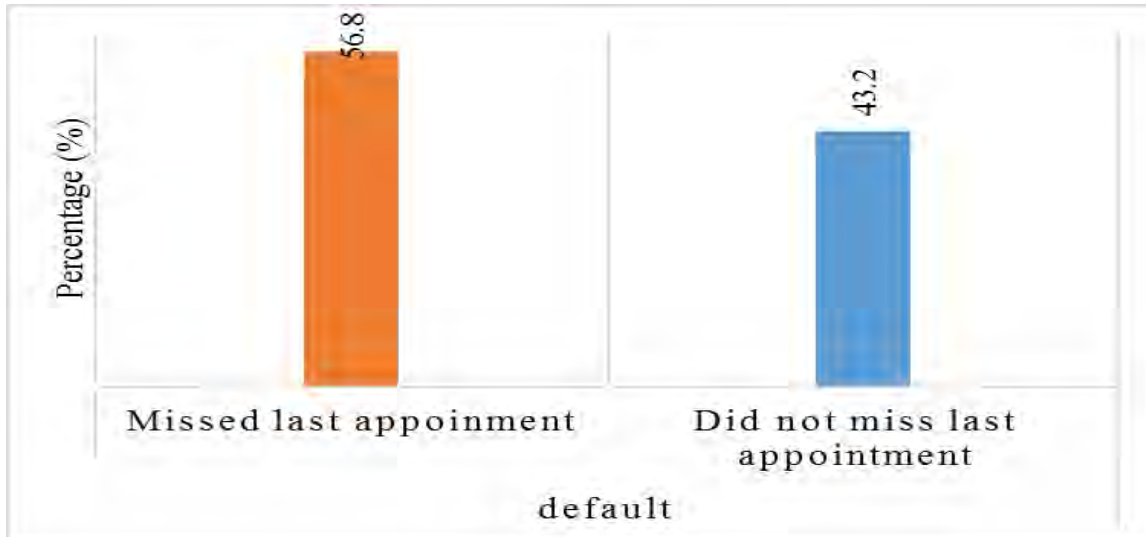


Figure 4.1: ART defaulting among PLWHIV/AIDS at the Volta Regional Hospital

Figure 4.1 shows results of ARVs defaulting among PLWHIV/AIDS at the Volta Regional Hospital. Overall, more than half, (56.8%) of the PLWHIV/AIDS defaulted (missed at least one of previous appointments).

4.4 Assessment of Patient-related factors

Figure 4.2 shows the assessment of patient-related factors in relation to ART defaulting. Close to one-third, (30.6%) of the participants stated forgetfulness of the appointment date as the reason for missing or defaulting in hospital appointment. In terms of side effects, more than one-third, (36.8%) of the participants stated that they did experience side effects. More than one-third, (34.9%) experienced excessive sleep while (27.1%) experienced skin rashes. Further, majority (70.9%) of the participants stated that they discontinued the ART because of the side effects.

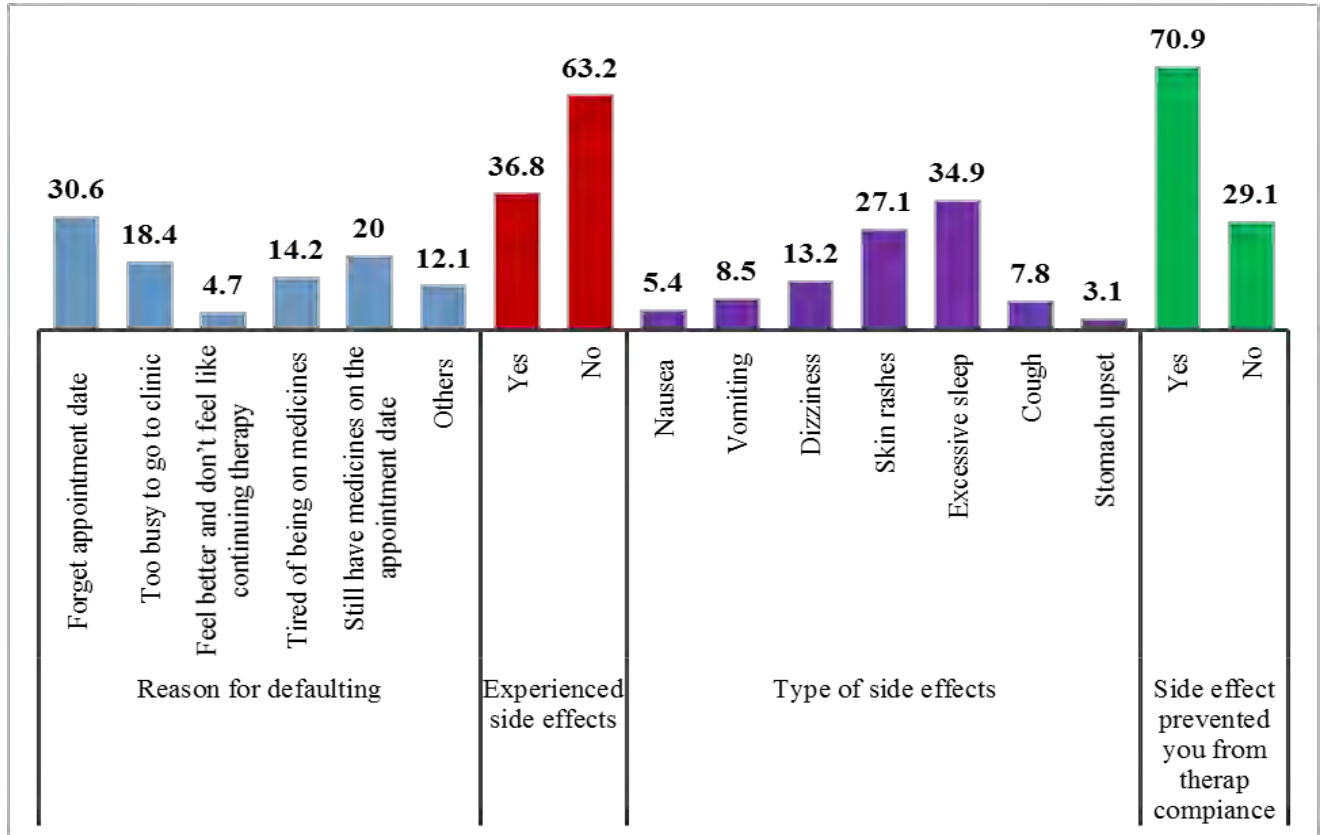


Figure 4.2. Assessment of Patient Related Factors

4.5 Assessment of health-facility related factors

The assessment of the health facility-related factors regarding ART defaulting is shown in table 4.2. Overall, almost all, 182 (99.5%) of the participants were told how to take the medications. However, majority, 154 (81.1%) were comfortable with the arrangement of being asked to come to the clinic on some specific days within the week. Additionally, more than half stated that they would prefer coming to the clinic on any day. Further, most, 175 (92.6%) of the participants stated that the location of the ART clinic was good for them. More than half, 109 (58.0%) of the participants agreed that separating the ART

clinic from other „normal“ departments of the hospital would make them uncomfortable because they could easily be identified by others. Majority, 100 (54.1%) of the participants mentioned that the time they spent at the hospital was too long.

Table 4.2: Assessment of health facility-related factors

Variable	Frequency(N)	Percent (%)
Were you told how to take the medicines correctly?		
Yes	182	99.5
No	1	0.5
Total	183	100.0
Are you comfortable with the arrangement of being asked to come to the clinic on some specific days within the week?		
Yes	154	81.1
No	36	18.9
Total	190	100.0
Will you prefer coming to the clinic on any day of the week instead of these special/specific days like this?		
Yes	108	57.1
No	81	42.9
Total	189	100.0
Is the location of the ART clinic good for you?		
Yes	175	92.6
No	14	7.4
Total	189	100.0
Separating the ART clinic from other “normal” departments of the hospital makes them uncomfortable because they can easily be identified by others.		
Strongly agree	69	36.7
Agreed	40	21.3
Neutral	25	13.3
Disagree	39	20.7
Strongly disagree	15	8.0
On the average how long do you spend at the clinic		
Less than 1 hour	13	6.9
1-2hours	54	28.4
More than 2 hours	123	64.7
Total	190	100.0
Do you think the time you spend at the hospital is too long?		
Yes	100	54.1
No	85	45.9
Total	185	100.0

4.6 Assessment of community-related factors

The results of the assessment of community related factors are presented in figure 4.3, and tables 4.3a and 4.3b. More than half 51.1% of the participants told at least a family member about their status apart from the health workers while a little above one-fourth 26.8% informed their spouse or partner. More than one-third 36.8% of the participants keep their status secret for fear of stigmatization while 26.4% stated fear of being gossiped about as the reason.

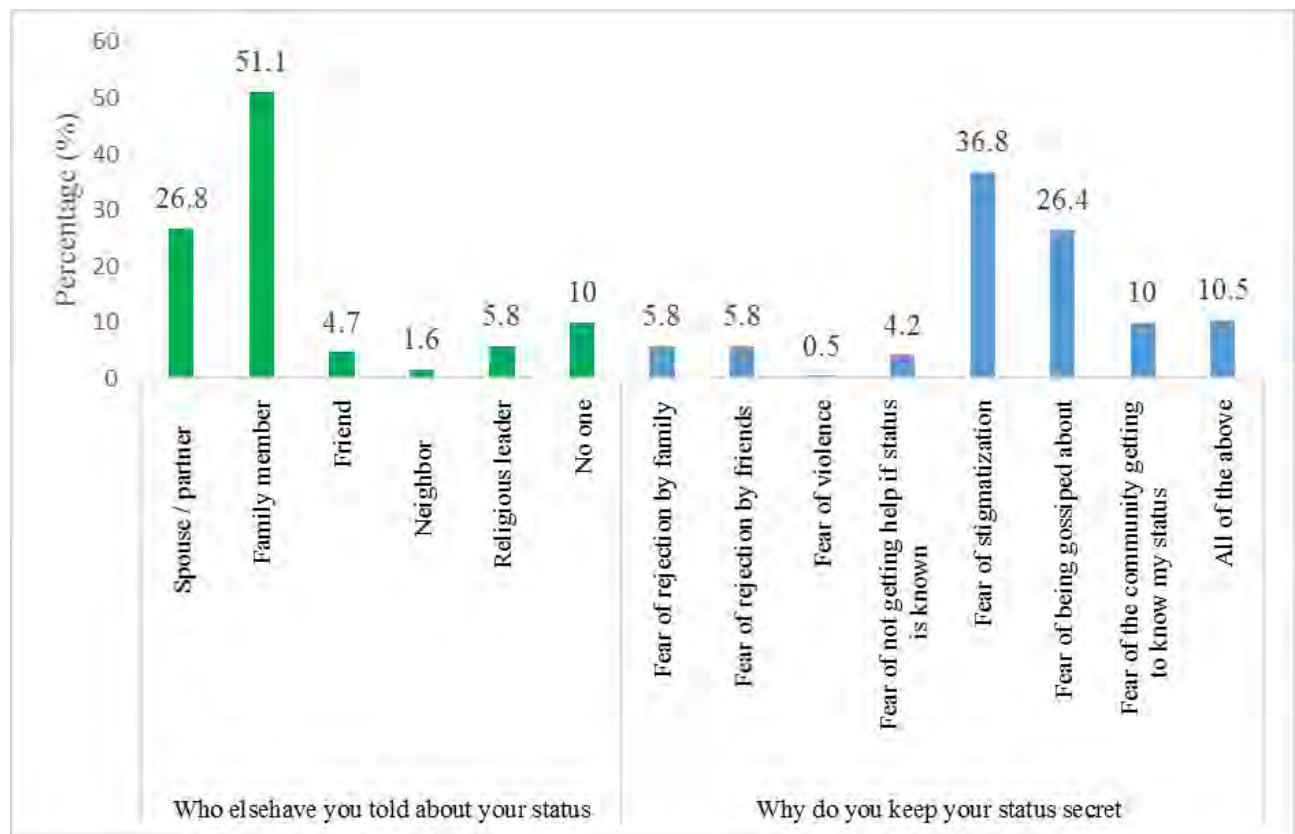


Figure 4.3: Assessment of community-related factors.

Majority, 103 (81.1%) of the participants stated that the behaviour of their partner was in support of them. Similarly, most, 120 (76.9%) reported that the behaviour of their family did support them. However, more than half, 77 (60.0%) of them stated that the behaviour put up by their friends was not in support of them.

Table 4.3A. Assessment of community-related factors

Variable	Frequency(N)	Percent (%)
Is your partner's behavior in support of you?		
Yes	103	81.1
No	24	18.9
Total	127	100.0
Is your family's behavior in support of you?		
Yes	120	76.9
No	36	23.1
Total	156	100.0
Do your friends' behavior show you of their support		
Yes	50	39.4
No	77	60.6
Total	127	100.0
Do the behaviors of people who live with you show you of their support?		
Yes	42	33.9
No	82	66.1
Total	124	100.0

Most, 82 (66.1%) of the participants stated that those who lived near did not show them support. Additionally, most, 63 (60.5%) of the participants indicated that they did not receive support from work colleagues. Most, 106 (66.7%) of the participants stated that they had not been treated differently by their family members and friends because of their status. Moreover, almost all, 146 (96.0%) of the participants stated that their culture or custom did not prevent them from going to the ART clinic on certain days.

Table 4.3B. Assessment of community-related factors

Variable	Frequency(N)	Percent (%)
Do the behaviors of your work colleague show you of their support		
Yes	41	38.5
No	63	60.5
Total	104	100.0
Have you ever been treated differently by family members/friends because of your status		
Yes	53	33.3
No	106	66.7
Total	159	100.0
How have you been treated differently		
Social support withdrawn	3	5.7
Discriminated	4	7.6
Stigmatized	13	24.5
Isolated by family members	30	56.6
Divorced	3	5.7
Total	86	100.0
Does your culture / custom prevent you from going to clinic on certain days		
Yes	6	4.0
No	146	96.0
Total	152	100.0

4.7 Assessment of economic-related factors

Results of the assessment of economic related factors are shown in table 4.4 below. Overall, more than one-third, 67 (35.8%) of the participants indicated that they could get to the ART clinic within 30 minutes while more than one-fourth, 48 (25.7%) could use between 1 and 2 hours. Majority, 164 (86.3%) did use either taxi or trotro to go (come) to the facility. A little below half, 80 (42.3%) of the participants stated that they miss appointments because of lack of money. Almost all, 188 (99.5%) of the participants informed that they did not pay for ARV medications. However, close to half, 84 (44.2%)

of them said that they did get worried over what to eat because of the improved appetite resulting from the use of the medications.

Table 4.4: Economic-related factors

Variable	Frequency(N)	Percent (%)
How long does it take you to get to the ART clinic		
Within 30 minutes	67	35.8
30 – 1 hour	28	15.0
1 – 2 hours	48	25.7
Above 2 hours	44	23.5
Total	187	100.0
How did you get here		
Walk	11	5.8
Taxi / tro-tro	164	86.3
Drive a car	13	6.8
Given a lift	2	1.1
Total	214	100.0
Have you ever missed appointment because of lack of money?		
Yes	80	42.3
No	109	57.7
Total	189	100.0
Do you pay money for your medications?		
Yes	1	0.5
No	188	99.5
Total	189	100.0
Do the ARVs make you eat a lot?		
Yes	138	75.4
No	45	24.6
Total	183	100.0
Do you sometimes get worried about what to eat after taking your medication		
Yes	84	44.2
No	106	55.8
Total	190	100.0

4.8 Chi-Square Tests: Relationship between ART defaulting and sociodemographic characteristics

From table 4.5, the log likelihood value for the educational level of the participants was 10.160 with a p-value of 0.038. This implies that the educational level of the participants had a significant influence on the ARVs defaulting. No significant association was seen between ARVs defaulting and the sex, age, marital status and religion of the participants.

Table 4.5. Chi-Square Tests: Relationship between ART defaulting and sociodemographic characteristics

Sociodemographic factors	Likelihood ratio	Asymp. Sig. (2sided)
Sex	1.573	0.158
Age	1.888	0.596
Educational level	10.160	0.038*
Marital status	3.931	0.269
Religion	4.796	0.187

4.9 Multiple logistic regression: Relationship between ART defaulting and sociodemographic characteristics

After adjusting for the confounding effects, there was no evidence of significant (adjusted OR = 7.08; 95 % CI = [1.51, 33.31]; $p < 0.05$) relationship between ART defaulting and sociodemographic characteristics. The results are detailed in table 4.6.

Table 4.6: Multiple logistic regression: Relationship between ART defaulting and sociodemographic characteristics

Exposure variable	OR	Adjusted analysis (95% CI)	p-value
Sex			
Male	1		
Female	1.27	(0.48, 3.38)	
Age (years)			0.404
18-20	1		
31-40	1.38	(0.31, 6.11)	
41-50	1.92	(0.42, 8.87)	
Above 50	0.71	(0.13, 3.86)	
Marital status			0.707
Single	1		
Married	1.18	(0.43, 3.30)	
Widow	0.70	(0.23, 2.14)	
Divorced /separated	0.54	(0.14, 2.17)	
Educational level			
None	1		0.667
Basic	2.37	(0.47, 11.89)	
Secondary	2.03	(0.40, 10.5)	
Tertiary	1.22	(0.24, 6.11)	
Occupation			
Unemployed	1		0.372
Public servant	1.05	(0.41, 2.73)	
Private sector	1.35	(0.34, 5.36)	
Self-employed	0.16	(0.02, 1.51)	
Reference	0.37	(0.14, 0.97)	0.043

4.10 Chi-Square Tests: Relationship between ART defaulting and patient-related factors

Table 4.7 presents results of the relationship between the ART defaulting and patient-related factors. From table, it could be seen that the log likelihood value for the variables “too busy to go to clinic” and “feel better and don’t feel like continuing therapy” were 4.615 and 10.813 with a p-values of 0.032 and 0.001 respectively. These p-values are less than 0.05. This implies that the contributing factors to ART defaulting among the PLWHIV/AIDS at the Volta Regional Hospital were that the patients were too busy, and they also did not feel like continuing the therapy because they thought that they were better.

Table 4.7. Chi-Square Tests: Relationship between ART defaulting and patient related factors

Patient – related factors	Likelihood ratio Asymp. Sig. (2sided)	
Forget appointment date	3.182	0.074
Too busy to go to clinic	4.615	0.032*
Feel better and don’t feel like continuing therapy	10.813	0.001*
Side effects	3.013	0.390

4.11 Chi-Square Tests: Relationship between ART defaulting and health facility-related factors

Table 4.8 presents results of the relationship between ARV defaulting and health facility-related factors. The log likelihood value for the variable “timeliness at the clinic” was 12.954 with a p-value of 0.005. This p-value is less than 0.05. This implies that timeliness at the clinic a significant influence on ARV defaulting among the PLWHIV/AIDS

Table 4.8. Chi-Square Tests: Relationship between ART defaulting and health facility-related factors

Facility-related factors	(2sided)	Likelihood ratio	Asymp. Sig.
How to take the medicine		1.662	0.197
Nature of arrangement of coming to the clinic		0.298	0.585
Location of ART clinic		4.427	0.109
Timeliness at the clinic		12.954	0.005*

4.12 Multiple logistic regression: Relationship between ART defaulting and facility-related factors

After adjusting for the confounding effects, there was evidence of significant (adjusted OR = 0.02; 95 % CI = [0.001, 0.49]; $p < 0.05$) relationships between ART defaulting and the location of the ART clinic as well as the time spent at the clinic. The results are detailed in table 4.9.

Table 4.9: Multiple logistic regression: Relationship between ART defaulting and health facility-related factors

Exposure variable	OR	Adjusted analysis (95% CI)	p-value
Are you comfortable with the arrangement of being asked to come to the clinic on some specific days within the week?			
Yes	1		0.263
No	1.75	(0.66, 4.68)	
Will you prefer coming to the clinic on any day of the week?			
Yes	1		0.656
No	0.84	(0.38, 1.84)	
Is the location of the ART clinic good for you?			
Yes	6.40	(1.40, 29.34)	0.017*
No			
On average, how long do you spend at the clinic?			
Less than 1 hour	1		
1-2 hours	6.71	(0.70, 64.48)	0.099
More than 2 hours	3.68	(0.38, 35.44)	
Do you think the time you spend at the hospital is too long?			
Yes	1		0.002*
No	3.86	(1.63, 9.15)	
Reference	0.02	(0.001, 0.49)	0.015

4.13 Chi-Square Tests: Relationship between ART defaulting and community-related factors

Table 4.10 presents results of the relationship between ART defaulting and community-related factors. The log likelihood value for the variable culture was 6.808 with a p-value of 0.009. This p-value is less than 0.05. This implies that the culture of the people has a significant influence on ART defaulting.

Table 4.10. Chi-Square Tests: Relationship between ART defaulting and community-related factors

Community factors	(2sided)	Likelihood ratio	Asymp. Sig.
Behaviour of partner		0.345	0.841
Behaviour of family		0.601	0.438
Behaviour of friends		0.002	0.961
Behaviour of people you live with		0.056	0.814
Behaviour of work colleagues		4.593	0.101
Culture		6.808	0.009*

4.14 Chi-Square Tests: Relationship between ART defaulting and economic-related factors

Table 4.11 presents results of the relationship between ART defaulting and economic related factors. In terms of the economic related factors, the log likelihood value for the variable “get worried what I will eat after ARVs” was 6.664 with a p-value of 0.006. This p-value is less than 0.05. This implies that, PLWHIV/AIDS get worried about what they will eat after the ARVs and this has a significant influence on their ARV defaulting.

Table 4.11. Chi-Square Tests: Relationship between ART defaulting and economic-related factors

Economic-related factors	Likelihood ratio	Asymp. Sig. (2sided)
Distance to ART clinic	1.766	0.779
Means of getting to clinic	3.634	0.458
Financial barrier	2.641	0.450
Get worried what I will eat after ARVs	6.664	0.006*

4.15. Multiple logistic regression: Relationship between ART defaulting and economic-related factors

After adjusting for the confounding effects, there was evidence of significant (adjusted OR = 0.97; 95 % CI = [0.46, 2.06]; $p < 0.05$) relationship between ART defaulting and the worry of the PLWHIV/AIDS about what they will eat after the ARVs. The results are detailed in table 4.12.

Table 4.12: Multiple logistic regression: Relationship between ART defaulting and economic-related factors

Exposure variable	OR	Adjusted analysis (95% CI)	p-value
How long does it take you to get to the ART clinic?			
Within 30 minutes	1		0.823
30minutes – 1 hour	0.50	(0.06, 4.37)	
From 1 hour – 2hours	2.81	(0.40, 19.53)	
Above 2 hours	0.44	(0.08, 2.47)	
Do the ARVs make you eat a lot?			
Yes	1		0.431
No	2.22	(0.31, 16.11)	
Do you sometimes get worried about what to eat after taking your medicine?			
Yes	1		0.026*
No	5.31	(1.22, 23.15)	
Reference	0.97	(0.46, 2.06)	0.000

4.16. Chapter summary

This chapter has presented the results in the form of tables and histogram which forms the basis for discussion in the next chapter. The next chapter discusses the results and tries to link the them with findings from literature and other studies.

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Introduction

This chapter presents the findings of the study in relation to reviewed literature on the research topic. The findings are discussed in accordance with the stated objectives and research questions. It tries to relate the findings with other authors' opinion on the subject matter. The study sought to determine the factors that influence ART defaulting among PLWHIV/AIDS at the Volta Regional Hospital (VRH). These are presented in six sections.

5.2 ART defaulting

The results showed that there was a high defaulting rate (56.8%). However, this was lower compared with findings in previous studies where defaulting was recorded (Ugboaja & Nwajiaku, 2010; Nyambura, Okoronkwo, Okeke, Chinweuba, & Iheanacho, 2013; Ohene et al., 2013). The high defaulting observed in this study and previous ones may be because of how busy these patients are as well as their low level of education. For instance, in this current study, majority of the participants were self-employed and with little external support. This render them busy to make ends meet. It has also been reported that side effects of drugs, and stigma, feeling healthy, fear of partner disclosure, long waiting period, and long term regimen of the treatment are the contributing factors to high defaulting (Okoronkwo *et al.*, 2013). Moreover, patients with no formal education

were found to be more likely to attribute non-adherence to poor communication, side effects of drugs, and stigma (Okoronkwo *et al.*, 2013).

5.3 ART defaulting and sociodemographic factors

The results of the study showed that there was a significant ($p < 0.05$) relationship between the educational level of the participants and their ART defaulting status. This confirms findings as documented in previous studies (Clive *et al.* 2011; Wakibi, Ng'ang'a, & Mbugua, 2011; Sabin *et al.*, 2014 Agu *et al.*, 2011) Some socio-demographic factors have also been attributed to ART defaulting, including age, sex, education and marital status (Clive *et al.*, 2011). Clive *et al.* (2011), noted that people of younger age are those likely to default. However, the current study recorded no such relationship apart from education. Contrarily, Okoronkwo *et al.* (2013), did not find any significant relationship between educational level and defaulting. However, education obviously plays a considerable role in understanding and communication of information between parties. Moreover, it has been found that, those with higher education are more likely than the other groups to attribute their ART clinic defaulting to busy schedule (Okoronkwo *et al.* 2013).

5.4 ART defaulting and patient-related factors

The study found a strong relationship between some patient-related factors and ARV defaulting. Patients with busier schedule and those who feel they were better and did not need to continue therapy were more likely to default ($p < 0.05$). A similar finding was recorded in previous studies (Clive *et al.*, 2011; Wakibi, *et al.*, 2011; Sabin *et al.*, 2014;

Bello, 2011). This could be because of inadequate knowledge of ART among the participants. Additionally, other factors such as waiting time at the clinic could be a contributing factor since most of the participants were busy. Moreover, other studies indicate that ART adherence is influenced by the patient's motivation, participation and psychosocial responses to ART (Skovdal et al., 2011).

5.5 ART defaulting and facility-related factors

Findings of the study showed that there was a significant relationship between ART defaulting and timeliness at the ART clinic ($p < 0.05$). This confirms a study by Clive *et al.* (2011), where waiting time was found to be a most influential factor in ART therapy adherence. This agrees with another study, which also cited the volume of work as a challenge in reducing waiting time on some clinic days (Lettow, Bedell, Mayuni, & Mateyu, 2014). Lettow *et al.* (2014), in their analysis of how to eliminate mother to child transmission of HIV, observed that there was an association between larger patient numbers and keeping them on therapy. That is to say that waiting time increased with more patients being attended to by few staff (Lettow *et al.*, 2014).

This observation was found to be consistent with other studies, which suggested that waiting time was a major determinant in ART defaulting (Hardon *et al.*, 2007). For instance, Hardon *et al.* (2007), reported that long waiting time was a challenge in some public health facilities in Uganda, Tanzania and Botswana. The mean waiting times were recorded as 5 hours, 4 hours and 5 hours respectively for these countries. These hours were long enough to discourage people from visiting such facilities again (Hardon *et al.*, 2007).

Moreover, other factors which could affect ART appointment or clinic days include attitudes of health workers (Kip, Ehlers, & Van Der Wal, 2009; Treves-Kagan *et al.*, 2015; Kagee *et al.*, 2011). For instance, some studies found that the service-centered barriers include nurses' attitudes and knowledge, health workers' inability to conduct home visits and to contact defaulters, limited clinic hours, delays in getting CD4 and viral-load results (Kip *et al.*, 2009).

After adjusting for confounding effects, another health facility factor (location of clinic) showed, significant evidence of association with ART defaulting. This is consistent with another study which revealed that, clients felt uncomfortable about the isolated location/sitting of the because they felt they would easily be recognised when going to such places (Lubaga *et al.*, 2013).

5.6 ART defaulting and community-related factors

The findings of the study showed that culture of the people has a significant influence on ART treatment compliance ($p < 0.05$). This study findings showed that culture prevented some of the patients from reporting to the ARV clinic ($p < 0.05$). This agrees with an earlier study, which suggested that ART adherence was influenced by the material, symbolic, relational and institutional contexts in which ARV users live as well as the patient's motivation, participation and psychosocial responses to ART (Skovdal *et al.*, 2011).

Additionally, Clive *et al.* (2011), noted that some people visit their traditional priests for consultation where local treatments are first employed. Closely tied to this factor is the

religious faith of some people. Certain religious faith requires that people fast at certain periods of the year, months or even days and such people would naturally not take their medicines during such periods (Clive *et al.*, 2011). Furthermore, a study carried out in Nepal where factors influencing adherence to ART were determined that found religion and culture were some of the barriers to people not adhering to their medications (Wasti *et al.*, 2012).

5.7 Relationship between ART defaulting and economic-related factors

The finding of the study showed that PLWHIV/AIDS were concerned about what to eat after taking their ARVs, which was significantly ($p < 0.05$) related to ART defaulting. This confirms findings of an earlier study carried out in Uganda, Tanzania and Botswana, where food security/insecurity was cited as a factor that influenced ART defaulting (Kagee *et al.*, 2011). Kagee *et al.* (2011), indicated that patients had difficulty taking their medicines because of the extra appetite that was associated with the use of the ARVs. Because of the insecure nature of their meals, it was indicated that clients preferred taking their medicines only when they had food readily available.

It was found that income was not significantly associated with defaulting in this study ($p < 0.05$). However, financial constraints have been cited in other studies as being a factor that could influence ART defaulting (Kunutsor *et al.*, 2010). Kunutsor *et al.* (2010), indicated that this was a main reason for missed visits for refill. Other research findings support this assertion (Kagee *et al.*, 2011). Kagee *et al.* (2011), reported that poverty was a major hindrance to clients accessing therapy because of difficulty in raising money for transport and other miscellaneous expenses on clinic days.

Moreover, a similar study in the Eastern Region of Ghana found that the lack of money was the over racking factor for defaulting (Clive *et al.*, 2011). Sabin *et al.* (2014), indicated that financial constraint made it difficult for clients to access therapy because they had to pay for medicines and use some of their money as transportation to the clinic. However, in the current study site, PLWHIV/AIDS did not pay for their therapy (99.5%). This may be the reason for the non-significant relationship between ART defaulting and income ($p=0.450$). Statistically, even though income did not indicate any significant influence on ART defaulting, it could still be argued that financial constraints have some association with ART defaulting. This was indicated by the high proportion of respondents 80 (42.3%), who said they missed hospital appointment because of lack of money.

5.8 Summary of the chapter

This chapter has discussed the results that were established from the study. It touched on some of the significant findings from the study and linked them with other studies. The results were all not in accordance with what was expected since many of the independent variables in the logistic regressions were not statistically significant. This could be due to the smallness of the sample size and the large number of the independent variables which reduced the degree of freedom for the estimation. The next chapter summaries the entire study, draws conclusions from the study objectives and recommendations.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents the summary, conclusion and recommendations of the study. The chapter is in sections. Section one presents the summary of the study. Section two presents conclusions of the study. Section three presents contributions to knowledge. Section four presents the recommendations of the study. Section five presents limitations to the study. Section six presents future research.

6.2 Summary of the study

This section presents the summary of the entire study in relation to the general objective. The study was set to determine the factors that influence ART defaulting among PLWHIV/AIDS at the Volta Regional Hospital (VRH) and to consequently, establish the relationship between the ART default and patient related, facility-related, community related and economic related factors. This was achieved by using quantitative research method to collect data. The data were analyzed using Stata V15. Overall, the study concludes that there was a high ART default among PLWHIV/AIDS at the Volta Regional Hospital (VRH). The key conclusions are presented based on the specific objectives of the study below.

6.3 Conclusions of the study

This section presents the conclusion of the study in relation to the specific objectives. As indicated earlier, the study revealed that there was a high ART default among PLWHIV/AIDS at the Volta Regional Hospital (VRH). These are deduced based on the results obtained in relation to the following discussed specific objectives of the study. Factors influencing this high default include demographic characteristics,

6.3.1 Influence of socio-demographic characteristics on ART Defaulting

From the results, conclusions can be drawn that education is the only socio-demographic variable that has a significant influence on ART defaulting ($p < 0.05$) at the VRH. This is in consonant with Sabin *et al.* (2014) who stated that clients' general knowledge of HIV/AIDS and the benefits of ART has some influence on them defaulting. Other demographic variables like sex, age, marital status and religion do not have influence on ART defaulting even though some literatures have cited them as having some influence on ART defaulting.

Influence of patient-related factors on ART Defaulting

This objective has been answered by the study which sought to establish whether there are some patient related factors that influence them to default. The fact that a significant number of respondents felt too busy to go to clinic means there is some association with ART defaulting ($p = 0.032^*$). It can also be added that improvement in the health state of PLWHIV/AIDS have the tendency of making them to default in ART. These assertions have been stated in some literatures (Clive *et al.*, 2011; Kranzer *et al.*, 2010).

6.3.2 Influence of facility-related on ART Defaulting

One of the specific objectives was to determine the health facility related factors that contribute to ART defaulting and if there are, whether those factors have any significant association with ART defaulting. In reviewing literature, it was found that spending long hours at the ART clinic could influence people on ART to default (Clive et al., 2011). With a ($p < 0.05$), long waiting time came out as one of the facility-related factors that have a significant relationship with ART defaulting. It can therefore be concluded that, clinic location also has some influence on ART defaulting while instruction on how to take medication has no effect on ART defaulting at the VRH.

6.3.3 Influence of community related on ART Defaulting

Culture was identified as the main community related factor that makes clients to default in their ART appointment ($p < 0.05$). This supports other studies which state that some clients prefer to follow their religious instructions, to going to hospital for medication refill whenever the appointment dates coincide with such religious activities (Clive et al., 2011). Though other community factors were identified, the results did not show any significant associations with ART defaulting.

6.3.4 Influence of economic related factors on ART Defaulting

The study wanted to establish which economic factors influence ART defaulting at the VRH. Some factors relating to economic issues were found to be contributing to ART defaulting at the VRH in accordance with what has been alluded by some researchers (Clive et al., 2011; Sabin et al., 2014). Food insecurity was seen to have a very strong

association with ART defaulting ($p < 0.05$). 84 (44.2%) said they were worried about what to eat after taking the ARVs. Long distance to health facility did not have any significant influence on ART defaulting. Notwithstanding this it can be concluded that the overriding economic factor that leads to people missing their clinic appointment for medication refill is lack of regular income (Kunutsor et al., 2010).

6.4 Contribution to Knowledge

This section presents contribution of the study in relation to the provision of ART in Ghana. The study contributes to knowledge by looking at the other aspects of ART services from the perspective of missing hospital appointments by PLWHIV/AIDS. Hitherto, most research works were focused on clients' adherence to ARV medications. Missing hospital appointments ought to be noted as one of the triggers to ARV medication non-adherence. Therefore, the findings of the study contribute to policy and practice, management of healthcare institutions/ART centres and methodology. These have been explained below.

6.4.1 Contribution to Policy

The current policy of test and treat means clients who tests positive to the HIV virus are put on Anti-Retroviral Therapy immediately after the client has been counselled (NACP, 2016; GAC, 2017). As a policy, clients on ART do not just go for medication refill, but they sometimes go through clinical investigations at the hospitals including laboratory services, radiological services, etcetera and are therefore expected to go to the facilities for these services (NACP, 2016). This comes with travelling cost on the part of some

clients which tend to make them default in their visits to ART clinics. Future policy review should therefore consider taking ART services to the door steps of the clients just like the way reproductive and child health activities (RCH) are done through community visits.

6.4.2 Contribution to Management of healthcare institutions / ART Centres

Hospital management should also consider the health facility related factors that were found to be significant and try to address them. For instance, the VRH and other facilities dedicate some days within the week for only ART services. Setting a day aside within the week by these facilities may not be ideal for clients due to delays created at ART centers because of large numbers of clients gathering for services on such days. The findings and other recommendations from the study should therefore be considered by the service providers. Increasing the number of clinic days within the week would cut down the delays at the clinics and ensure that clients are promptly treated and taken care of when they visit the clinics.

6.4.3 Contribution to Methodology

Most studies in ART defaulting tend to be qualitative in nature. The method used by the researcher has therefore, helped to quantify the problem. This is a contribution to methodology as the methods applied were rigorous enough to help obtain responses from the study participants. The methods were friendly in nature because participants felt more comfortable responding to the questions posed to them, compared to qualitative methods which are usually seen to be more intruding in nature.

6.5 Recommendations

Based on the findings from this research, the following recommendations were made:

1. There is the need for more education on ART and its importance among PLWHIV/AIDS at the Volta Regional Hospital (VRH). More adherence counselling needs to be done by service providers to motivate clients to continue to seek hospital treatment even though they may feel better with continuous therapy.
2. Facilities that render ART services should consider calling and sending other forms of reminders to clients about their appointment dates.
3. Further studies are needed in other facilities that render ART therapy service to help identify other factors that influence ART defaulting to confirm the findings of this study or otherwise. This will help inform policy.
4. The health facility and others should consider allocating two or more days within the week to attend to ART clients. This will help reduce the long waiting hours clients spend at the clinic.
5. Policy makers and hospital authorities should consider taking ART services to the communities where medications could be sent to them instead of waiting for them to come to clinic for refill. This would also help do defaulter tracing, just like what is done in TB defaulter tracing.

6.6 Limitations to the study

This study had some limitations. One major limitation of the study was the small sample size. The sample size was small compared with the number of HIV patients that are on ART at the VRH. Again, since the focus of this study was to determine factors that influence ARVs default at the Volta Regional Hospital, the conclusions drawn from this study cannot be generalized. However, it can be extended to other facilities that share similar characteristics. Another limitation is the fact that the data might be subject to bias by how the questionnaire was structured and the sincerity of respondents' answers. Using only quantitative method was also a limitation to the study since it did not allow respondents to ascribe reasons for one's behaviour. Despite all these limitations, the internal and external validity of the study was not adversely affected.

6.7 Future Research

There are still other areas the researcher could not extend the study on. Future studies should use other facilities or Metropolis/Municipals/Districts (MMDs) and increase the sample size since the sample used in this study was small. Future studies should also use qualitative methods to try to explore the distinctive attributes and reasons behind what were quantified. Again, future research should seek to find a way of standardizing the definition of ART defaulting in Ghana since its use is interpreted differently from one facility to the other.

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APPENDICES
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APPENDIX A: Participant Information Sheet

Project Title: Factors influencing ART defaulting among People Living with HIV/AIDS (PLWHIV/AIDS) at the Volta Regional Hospital

Name and Address of Principal Investigator

My name is Justice Koku-Anu Dery, Department of Health Policy Planning and Management, School of Public Health, University of Ghana, Legon. Contact details are: Mobile Number: 0208294071/0553315163. Email: kokjus2010@yahoo.com or jdkoku-anu@st.ug.edu.gh

Introduction

Dear Participant, I am an MPH student of the University Of Ghana School Of Public Health. I am conducting a study on the topic: **Factors influencing ART defaulting among PLWHIV/AIDS at the Volta Regional Hospital, Ho.** This study is part of the requirements for the award of Master of Public Health degree. I would like to seek your approval and permission to ask you some few questions on ART and defaulting among PLWHIV/AIDS. All information collected will be treated confidentially and no one will be able to trace any information back to you.

Procedures/Nature

The purpose of this study is to unearth some of the factors that could be influencing defaulting at the Volta Regional Hospital. The nature of the study will require you to answer some few questions that will take a maximum of 30 minutes.

Potential Risks

The study will not be of any risk or cost to you because I have taken time to reduce that by protecting your identity to absolutely zero. All participants will not be exposed to any clinical risks whatsoever. The study could however, evoke some psychological emotions and discomfort because of the nature of some of the questions.

Benefits of the Study

This work will have immense benefit to all actors and stakeholders involved in ART services in the country and the study location. Findings from the study will help both clients and service providers as it could help draw lessons from it and put in mechanisms to perfect the system. The information will also arouse the interest of policy makers to pay more attention to how ART services are rendered and put in some interventions where necessary.

Cost

The investigator is the sole financier of the study hence, will not be of any financial cost to participants. There could however, be other forms of costs to participants in the form of time spent/wasted.

Compensation

Participants will not be given any money or financial compensation. However, water will be made available for those who thirsty during the exercise.

Confidentiality

Clients' confidentiality will be enforced by using special codes to mask their identity. Please be assured that, no name of any participant will be used in this research. All information gathered from clients will be destroyed after analysis of the work has been done.

Funding Information

The principal investigator is the sole financier of the project.

Voluntary participation/withdrawal

Participation is purely voluntary hence participants can at any point during the study discontinue and will not be liable for anything. Participants' decision to leave will not have any effect on them as far as service provision from this hospital is concerned even though I will be glad if participation is continued to the end.

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APPENDIX B: Informed Consent Form

Project Title: Factors influencing ART defaulting among People Living With HIV/AIDS (PLWHIV/AIDS) at the Volta Regional Hospital

Introduction/General Information

Dear Participant, my name is Justice Koku-Anu Dery, and I am an MPH student of the University of Ghana School of Public Health. I am conducting a research on the topic: Factors influencing ART defaulting among PLWHIV/AIDS at the Volta Regional Hospital, Ho. This research is in partial fulfillment of the requirement for the award of Master of Public Health Degree and I would like to seek your permission to ask you some few questions. The purpose of this study is to unearth some of the factors influencing defaulting of ART appointment at the Volta Regional Hospital.

Procedure/Nature

The population of interest targeted in this research are HIV/AIDS clients who are accessing ART at the Volta Regional Hospital. The study involves the use of questionnaire that will require participants to answer some few questions that will take a maximum of 30 minutes. Participants for the questionnaire interview will be selected through simple random sampling method.

Benefits of the study

This research will help the hospital taking care of you to know how the programme is helping you. It will also show the problems facing you and your other colleagues though they will not be able to tell who provided which information. The information will also arouse the interest of policy makers to pay more attention to how ART services are rendered and put in some interventions where necessary.

Potential Risk

The study will not be of any risk or cost to you because I have taken time to reduce that by protecting your identity to absolutely zero. You will not be exposed to any risks whatsoever. This study could however evoke some psychological and emotional discomfort for you because of the nature of some of the questions.

Confidentiality

Strict confidentiality will be enforced by using special codes to mask your identity. Please be assured that, your name will not be mentioned anywhere in this research work. Every information gathered from clients will be destroyed after analysis of the work has been done.

Withdrawal from the Study

Participation in this study is voluntary and participants may withdraw at any time without any penalty. Your decision to leave will not affect you when you come back to this hospital or any other hospital for service. Participants can choose not to answer any

individual question or all the questions and no one will force you. However, I will be happy if you can continue to the end.

Contact for Additional Information

If you have any question(s) or further clarification concerning this study and/or the conduct of the researcher, please contact the researcher on 0208294071/0553315163. Email: kokjus2010@yahoo.com or jdkoku-anu@st.ug.edu.gh. Mrs. Hannah Frimpong (Administrator), Ghana Health Service Ethical Review Committee Secretariat, Accra. Tel: 0507041223/0243235225.

Consent Declaration: I..... have been well informed on the methodology and relevance of this research. I have also read (or was read and explained to me) the details of this research and I agree to take part in it without any form of duress. I also understand that I can withdraw at any time in-between. Having been assured of the anonymity and confidentiality of the research I consent to partake in this study.

.....
Signature or thumbprint of participant Date

.....
Signature of Researcher Date

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APPENDIX C: QUESTIONNAIRE FOR ART PATIENTS

Dear Respondent,

The topic for the research is: **“Factors Influencing Antiretroviral Therapy (A.R.T) Defaulting among People Living with HIV/AIDS (PLWHIV/AIDS)”** and would be grateful if you could take some time to answer the following questions below. All answers provided would be treated with the utmost confidentiality. Please kindly indicate your answer with a tick (✓) or write in the space provided.

Section A: Socio-Demographic Characteristics /Patient Factors

1. What is your gender Male () female () Transgender ()

2. What is your age in completed years? Tick where appropriate.
18-23 years () 24-29 years () 30-35 years () 36-41 years ()
42-47 years () 48-53 years () 54-59 years () 60 or more ()

3. What is your marital status?
Married () Single () Widow () Divorced/separated ()
Others (specify).....

4. What is your Religion?

Christian () Muslim () Traditionalist () others
(specify).....

5. What is your level of educational?

(a) Never gone to school.....()

(b) Primary.....()

(c) JHS.....()

(d) SHS.....()

(e) Tertiary.....()

6. What is your occupation?

Unemployed () Public Servant () Private sector employee () self-
employed () Student () others (specify).....

Patient Factors/ART Side Effect

7. Have you ever missed your hospital appointment dates by one day or more?

Yes () No ()

8. Reasons for missing/defaulting in hospital appointment.

(a) Forget appointment date.....()

(b) Too busy to go to clinic.....()

(c) Feel better and don't feel like continuing with therapy.....()

(d) Tired of being on medicines/Taken it for too long ()

(e) Client still have medicines on the appointment date Yes () No
()

Strongly agree (), Agree (), Neutral (), Disagree () Strongly
Disagree ()

18. On average, how long do you spend at the clinic?

(a) Less than 1 hr....()

(b) 1-2 hrs.....()

(c) More than 2 hrs...()

19. Do you think the time you spend at the hospital is too long? Yes () No
()

20. If Yes in Q.18, where does the delay come from? The laboratory ()
The ART Nurse or Pharmacy () Others (Please
indicate).....

Section C: Community Related Factors

21. Apart from the health workers, who else have you told about your HIV status?

Spouse / partner, if you have one (), Family member (), Friend (),
Neighbour () Religious leader (), No-one ()

22. Do you keep your status secret for any of the following reasons?

Fear of rejection by family () Fear of rejection by friends ()

Fear of violence () I will not get help from others if they know my
status ()

Fear that I will be stigmatized () Fear that people will gossip about me ()

How will you describe the following? Indicate Yes for Supportive or No for Unsupportive		
How will you describe your partner's behaviour towards you, if you have a partner?		
How will you describe the behaviour of your family towards you?		
How will you describe the behaviour of your friends towards you?		
How will you describe the behaviour of the people you live with towards you?		
How will you describe the behaviour of your work colleagues towards you?		

23. Have you ever been treated differently by family members/friends because of your HIV status? Yes () No ()

24. If your answer is yes, how?

(a) Social support was withdrawn by family members.....()

(b) Discriminated.....()

(c) Stigmatized.....()

(d) Isolated by family members.....()

(e) Others (specify).....

25. Does your culture/custom prevent you from going to clinic on certain days?

Yes ()

No ()

Section E: Economic Factors Influencing ART Defaulting

26. How long does it take you to get to the ART clinic? Within 30min ()

30 min to 1 hour ()

1 hour ()

2 hours and above ()

27. How do you get to the clinic? Walk () Taxi/Tro-tro () Drive a car ()
Given a lift () Others (Specify).....
28. Do you ever miss appointments because you don't have money for transport?
Yes () No ()
29. Do you pay money at the clinic for your medications? Yes () No ()
30. If yes, how much money (GHS) did you spend for:
(a) Consultation
(b) Lab test.....
(c) Treatment.....
(d) Medicine.....
31. What happens if you don't have the money? Miss Appointment () Denied
ARV drugs () Denied laboratory service () others
32. Do the ARVs make you eat a lot? Yes () No ()
33. Do you sometimes get worried about what to eat after taking your medicine?
Yes () No ()

Thank You for Participation

**NOTE: This questionnaire is partly adapted from Clive et al. (2011) and
Mary Damtse Lincoln (2016).**