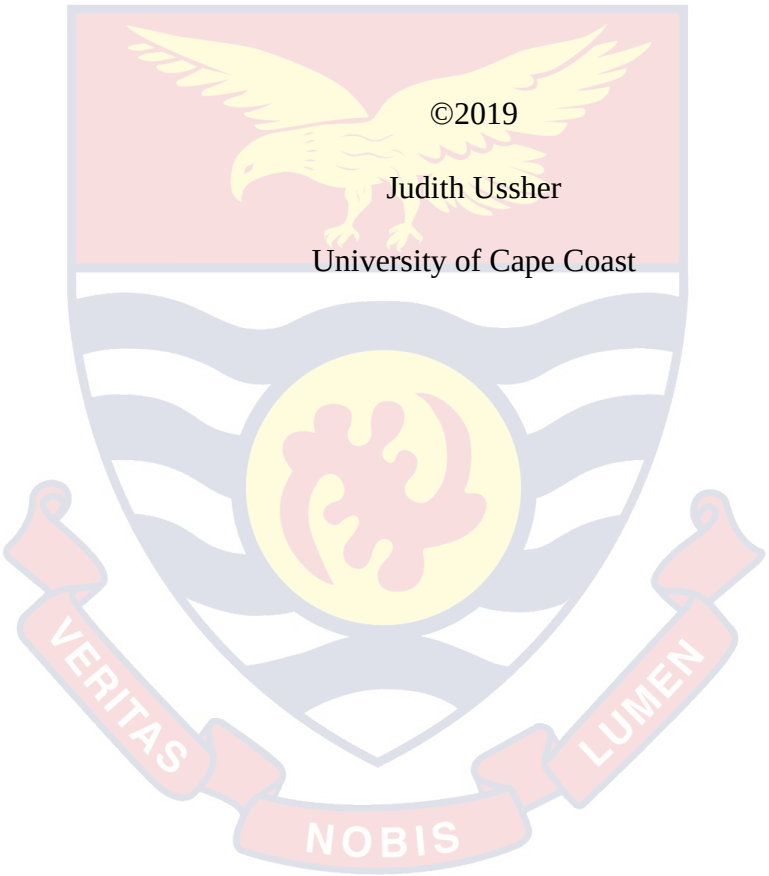
UNIVERSITY OF CAPE COAST

PHYSICIAN-PATIENT RELATIONSHIP, PATIENT SATISFACTION, SOCIAL SUPPORT AND ANTIRETROVIRAL MEDICATION ADHERENCE AMONG HIV INFECTED ADULTS

JUDITH USSHER

2019



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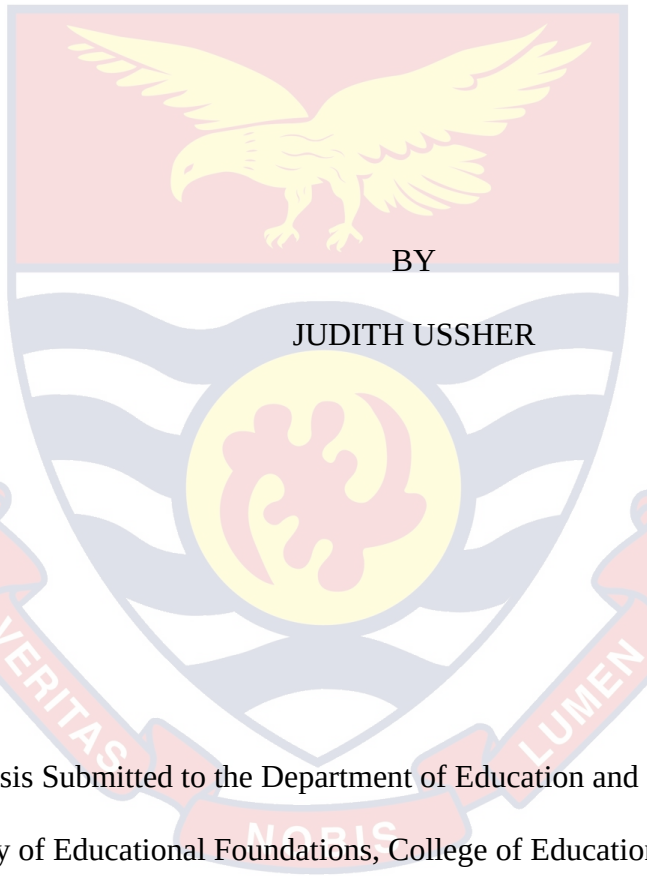

BY

JUDITH USSHER

Thesis Submitted to the Department of Education and Psychology of the Faculty of Educational Foundations, College of Education Studies, University of Cape Coast, in partial fulfilment of the requirements for award of Master of Philosophy Degree in Clinical Health Psychology

AUGUST 2019

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:……..... Date:…….

Name: ……..

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature:…….... Date……...

Name: ……

Co-supervisor's Signature:…… Date:……..

Name: ……

ABSTRACT

This research investigated physician-patient relationship, patient satisfaction, social support and antiretroviral medication adherence among HIV infected adults at the Asankrangwa Catholic Hospital. The Survey research design was employed and the convenience sampling technique was used in selecting 257 HIV patients as participants. Four research questions and four hypotheses guided the study. The research questions were answered using means and standard deviations. Hypotheses were tested using the standard multiple regression, hierarchical regression, mediation analysis and bootstrapping approach. The research outcome indicated an overall positive and good physician-patient relationship and patients were satisfied with the relationship they had with their practitioners and the health care system. Social services available to the HIV patients were from the family and significant others, and the study revealed a medium to high level of adherence among HIV patients. Support from significant others as well as patients' satisfaction was found as a significant predictor of adherence to ART medication. Together, social support, patients' satisfaction, and physician-patient relationship significantly predicted adherence to medication. Patients' satisfaction mediated between support from family as well as support from significant others and adherence to ART medication. Gender, marital status and educational level were not found to be associated with adherence to medication. The study recommended that the Ministry of Health, Ghana Health Service, Hospital management and Health care practitioners put adequate measures in place to increase satisfaction among patients, and also involve Clinical health psychologists in the running of the ART centres as part of the clinical team to identify the psychosocial issues of clients and provide needed interventions.

ACKNOWLEDGEMENTS

I am sincerely grateful to my supervisors, Prof. Koawo Edjah and Dr. Kofi Krafona, both of the Department of Education and Psychology, for their professional guidance, advice and encouragement throughout this work. But for them I may not have met the deadline for this thesis.

I want to express my profound gratitude to the management of Cape Coast Municipal Hospital for accepting my request to use their facility for piloting of this research and Asankrangwa Catholic Hospital for the main study. I am also grateful to the management and staff of these two facilities for allowing me to use their patients as participants for this research.

Finally, I want to thank my family and friends for their support, especially, my mother, Mary Duku, my sister, Victoria Ussher, and her husband, Joseph Atta Boakye, and to all who in one way or the other contributed to this success story.

DEDICATION

To my late sister, Alice Ussher, may her soul rest in perfect peace.

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LIST OF ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral therapy
ARV	Antiretroviral
AZT	Zidovudine
BPS	Biopsychosocial
CD4	Cluster of Differentiation 4
HAART	Highly Active Antiretroviral Therapy
HBM	Health Believe Model
HIV	Human Immunodeficiency Virus
IMB	Information-Motivation-Behavioural skills
IMCHB	Interactional Model of Client Health Behaviour
PLWHIV	Persons Living With Human Immunodeficiency Virus
PMT	Protection Motivation Theory
SCT	Social-Cognitive Theory
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UNAIDS	United Nations Programme on HIV/AIDS
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

Background to the Study

In the early 1980s reports from the Centers for Disease Control (1981) first described Acquired Immune Deficiency Syndrome (AIDS), as an acute illness in gay men which was usually fatal. In 1983 an infectious agent, the Human Immunodeficiency Virus (HIV), was identified as the causal factor of AIDS. It soon became clear that HIV is not only a disease of gay men, but also of heterosexuals. The most frequent route of transmission is through penetrative sex between men, or between men and women. HIV can also be transmitted through blood and blood products. This may also occur through the sharing of inadequately sterilized needles, syringes or other skin piercing instruments while injecting drugs and occasionally through needle-stick injuries. The virus can also be passed from person to person via donated organs or semen and from mother to child during pregnancy, at the time of delivery or through breastfeeding.

HIV disease is a chronic condition in which the asymptomatic phase, i.e. without symptoms, may last for many years. A diagnosis of AIDS is made when HIV has damaged the immune system to such an extent that certain opportunistic infections, tumours or encephalopathy are observed (Centres for Disease Control, 1992). Until 1996 most medical interventions were directed towards the control of diseases that occur as a result of the lowered immune function. In the late 1980s it was found that some benefits could be obtained

by taking a single antiretroviral drug such as Zidovudine (AZT) (Centres for Disease Control). Since then, an increasing number of antiretroviral drugs, including protease inhibitors, which inhibit the replication of HIV, have become available. When three or more of these are used in combination (Highly Active Antiretroviral Therapy or HAART) they effectively reduce the viral load and increase the CD4 count. HAART is considered responsible for the increased survival times and decreased bouts of illness and decreased progression rates to AIDS (Palella, et al, 1998; Paredes et al, 2000; Sepkowitz, 1998).

However, HIV disease remains a life-threatening illness with no cure. Adherence to HAART is vital if viral suppression is to be maintained. Unless viral replication is virtually eliminated any mutation that is resistant to the HAART regimen being taken can rapidly multiply. Drug-resistant viruses then render the individual susceptible to immune dysfunction illnesses. Non adherence can lead to various side effects apart from the prognosis of HIV to AIDS. As well as being an issue for affected individuals, who are then vulnerable to increased mortality (Hogg, et al., 2002), non-adherence can also have a bearing on public health (Wainberg & Friedland, 1998). It is likely that those who are on HAART and whose viral load is low or undetectable are less likely to transmit virus through unprotected sex; however, infection is still possible. Thus, non-adherence can increase the probability of transmission of drug-resistant virus. There is already evidence that a drug-resistant virus in newly infected persons has been found (Boden et al., 1999). Thus, people newly infected with HIV could find themselves unable to benefit from HAART. Unfortunately, the complex and demanding medication regimens

required, and the unpleasant side-effects experienced by some people on HAART, have made adherence to drug regimens a problematic issue. Some medications must be taken at precise time intervals under strict nutritional conditions, and some have notable toxic effects. Incorporating them into a daily routine is no mean feat. Adherence requires considerable self-discipline. Treatment adherence is taking prescribed dose of medication at prescribed time. As HIV progresses, it becomes very important for the patient to follow the treatment regimen prescribed. If the treatment regimen is not followed, HIV may become resistant to the therapy, causing it to stop working and will lead to AIDS. Adherence issues can put an enormous strain on the daily lives of the patients.

HIV treatment regimens are very complicated and often require the patient to take several medications at varied doses with restrictions on food intake and activities (Beach, Keruly & Moore, 2006). Therefore a supportive relationship between a physician and his/her patient will help the patient overcome many barriers including medication regimen and psychological barriers. To Beach, Keruly & Moore, two way communications, clear instructions, prompt response from physicians, able to reach health care providers immediately, are some ways to strengthen patient-physician relationship and will also enhance trust. Ability for physician/ health care provider to monitor patient's well-being and adherence will enhance treatment results. According to Malta, Petersen, Clair, Freitas, & Bastos (2005), patient related factors also play a major role in the efficacy of the medication and handling these factors well can help improve medication adherence. Some of these factors are: patient's knowledge about the disease, understanding the

importance of adhering to treatment schedules, forgetfulness, accepting unpleasantness of the medications, confusion on dosages. Most of these issues can be addressed by caretaker/ physician to improve quality of life and treatment effectiveness. Malta, Petersen, Clair, Freitas, and Bastos found that discussions between patients and physicians about the patients' concerns and well-being can encourage or, if absent or misguided, discourage adherence to drug regimens and retention of patients for follow-up, as well as helping to mediate the impact of patient beliefs on adherence.

Dang, Westbrook, Black, Rodriguez-Barradas, & Giordano (2013), in their study in the United States, which controlled age and health status, found that patient satisfaction with the HIV care received from a health facility in the past year was significantly associated with both retention and adherence to treatment. A potential link between satisfaction of care and retention is that satisfaction can provide motivation for an individual to continue to seek HIV care, while dissatisfaction can produce barriers and reduce a patient's willingness to start or to continue treatment, even if they have already tested HIV-positive through services that a facility provided. According to Roberts (2002) some steps can be taken by health facilities to increase patients' satisfaction, thereby increasing continuity of care. These steps include building rapport between health care providers and patients, improving the communication skills of providers, and training providers to be more aware of the facilitators and barriers of adherence.

Particularly in the realm of adherence counselling, positive experiences during a health care visit can impact the patients' feeling of self-efficacy – that is, whether they believe their actions of taking their medication and coming in

for facility visits will actually make them get better. Beach, Keruly, & Moore (2006), Johnson et al (2006), and Schneider, Kaplan, Greenfield, Li and Wilson (2004), in their studies found that patients' beliefs about the effectiveness of medicine impact their adherence to treatment regimens. Though both positive and negative health care experiences influencing patient satisfaction can impact retention in care, the ultimate goal of HIV care is HIV viral load suppression. The link between satisfaction, medication compliance, retention, and eventual viral load suppression intuitively makes sense since HIV patients not retained in care are much less likely to achieve viral load suppression. It is therefore important to investigate potential factors associated with HIV viral load suppression for patients who have already had contact with the health care system. This is an area in which interventions can be performed in order to increase the odds of patients having undetectable viral load in their systems.

Lack of support from family and the society at large are also strong contributors in the treatment of HIV. Generally, drug adherence is successful if the available social support structures create an enabling environment to aid medication compliance (Cox, 2002). People living with HIV require positive support from the society to live with the disease. This is not normally achieved especially in developing countries. Stigma, family support, and social infrastructure, among others affects adherence to medication treatment. Although revealing status can expose one to stigma, having someone to assist in adhering to medication and treatment requirements can enable People Living With HIV (PLWHIV) adhere to ART. A study by Amankwah (2015) found out that social factors like existence of support and disclosure without

stigma influenced adherence to ART. Disclosure of status led to support because health professionals passes confidants (treatment supporters) through series of counseling to inform them on how to care for people living with HIV and AIDS. This could be the reason why there was fewer stigmas. DiMatteo (2004), in a meta-analyses establish significant average r-effect sizes between adherence and practical, emotional, and unidimensional social support; family cohesiveness and conflict; marital status; and living arrangement of adults. Substantive and methodological variables moderate these effects. Practical support bears the highest correlation with adherence. Marital status and living with another person (for adults) increase adherence modestly.

Statement of the Problem

Treatment and support of persons living with HIV and AIDS in Ghana started in mid-2003 (Ghana Health Service/National AIDS/STI Control Programme, 2016). Ghana had an adult HIV prevalence of 1.6 % in 2015 and ART coverage in the country is suboptimal, with about 34% of all AHV-infected people receiving ART in 2015 (UNAIDS, 2016). HAART has rendered HIV infections a chronic disease and is considered responsible for the increased survival times and decreased bouts of illness and decreased progression rates to AIDS (Hogg et al., 1998; Palella et al 1998; Paredes et al 2000; Sepkowitz, 1998). The existence of non-adherence can obstruct the sustainability of programmes intended at successful HIV and AIDS care.

A lot of studies carried out on adherence in low and middle income countries identified factors such as financial constraints, stigma and inadequate information as hindrance to adherence (Nachega et al, 2006). But as reported by UNAIDS in 2012, there is no doubt that accessibility has been

improved. For instance in Ghana, financial access has been dealt with by the government by subsidizing the cost of ART. People living with HIV have access to free health care (UNAIDS, 2012). In spite of this, HIV individuals continue to receive stigmatization in society, especially in low and middle income countries such as Ghana. It is therefore expected that HIV patients will find solace with their health care professionals who can provide with the 'human aspect' of HIV/AIDS care which can help them adhere to medical treatment. These 'human aspect' of HIV/AIDS care include physician-patient relationship, patient satisfaction, and social support.

Physician-patient relationship affects adherence to medication as it is believed that when individuals feel that they were involved in the decision making process with regards to their health and are treated as equals by their physician, there is a greater chance that they will adhere to treatment medication (Stavropoulou, 2012). Social support has also been hypothesized as one of a number of antecedent stress resistance resources that contribute to positive adaptational outcomes (Lazarus & Folkman, 1984), and according to Vyavaharkar et al (2007), an important adaptational outcome for HIV disease is medication adherence, and receiving emotional, informational, and/or tangible support from others in the face of a stressful situation is a major factor mediating such outcomes. Again, as maintained by Crow et al. (2002), patient satisfaction is a cognitive evaluation of the service that is emotionally affected, and it is therefore an individual subjective perception and that the most important determinants of satisfaction are the interpersonal relationships and their related aspects of care. Given this, it is expected that when patient are satisfied with their interpersonal relationships with family, friends and

significant others, as well as with their health related aspect of care, especially their relationship with physicians, they will adherence to medication.

However, majority of the studies on factors that affect HIV medication adherence that looked at physician-patient relationship, patient satisfaction and social support were carried outside Ghana (eg., the study of Cox, 2002, Roberts, 2002, DiMetteo, 2004, Vyavaharkar et al., 2007, Levitz, 2014, Ironson, Lucette and McIntosh, 2015). It is therefore unrealistic to generalise such findings to our setting as these countries share a different view as well as different cultural values, and practices as compared to the Ghanaian context.

Therefore, investigating the relationship between physician-patient relationship, patient satisfaction, social support, and HIV medication adherence in Ghana is essential in the understanding of these variables in the Ghanaian context.

Purpose of the Study

The purpose of this study is to investigate the relationship between physician-patient relationship, patient satisfaction, social support and adherence to antiretroviral medications. Specifically, the objectives of the study are as follows:

1. Determine the types of physician-patient relationship that exist at the Asankrangwa Catholic Hospital ART center.
2. Assess patients satisfaction based on the type of relationship they have with their physician
3. Investigate what social supports are available to patients.
4. Determine adherence levels among ART patients.

5. Examine the relationship between physician-patient relationship, patient satisfaction, social support and adherence.

Research Questions

The following research questions guided the study:

1. What is the nature of physician-patient relationship at the Asankrangwa Catholic Hospital ART Center?
2. What is the level of patients' satisfaction of their relationship with medical practitioners?
3. What are the social supports available to HIV/AIDS patients at Asankrangwa Catholic Hospital?
4. What is the level of adherence to ART medication among HIV/AIDS patients?

Research Hypotheses

For the purpose of this study, the following hypotheses were stated:

1. H_0: Physician-patient relationship, patients' satisfaction, and social support do not significantly predict adherence to ART medication.

   H_1: Patients' satisfaction, physician-patient relationship, and social support significantly predict adherence to ART medication.

2. H_0: Patients' satisfaction does not significantly mediates the relationship between social support and adherence to ART medication.

   H_1: Patients' satisfaction significantly mediates the relationship between social support and adherence to ART medication.

3. H_0: There is no significant association between demographic variables, and adherence among HIV patients.

   H_1: There is significant association between demographic variables, and adherence among HIV patients.

4. H_0: Patients' satisfaction significantly mediates the relationship between physician-patient relationship and adherence to ART medication.

   H_1: Patients' satisfaction significantly mediates the relationship between physician-patient relationship and adherence to ART medication.

Significance of the Study

The outcome of this study will help health professionals and Government officials in Ghana to design and implement policy interventions aimed at enhancing and maximizing long term adherence to ART for successful treatment outcomes for HIV/AIDS patients.

The findings of this study will also be useful to other researchers conducting studies in the area of antiretroviral medication adherence and might have significant clinical benefits for people living with HIV in Ghana and more especially in Wasa Amenfi West District. Not only will the findings of this study have significant clinical benefits for people living with HIV in Ghana and more especially in Wasa Amenfi West District, the findings will also serve as evaluation of the centre in terms of patients adherence to antiretroviral medication and also help health professionals design and implement policy interventions aimed at enhancing and maximizing long term adherence to ART for successful treatment outcomes for HIV/AIDS patients.

Delimitation

This study was delimited to HIV positive patients only, specifically, those receiving care at the Asankrangwa Catholic Hospital in the Wasa Amenfi West District and aged 18- 65 years.

Limitations

The most significant limitation of the study was the use of non-probability sampling techniques during the data collection. The convenience sampling technique was a limitation factor in generalising the study results.

Given how novel this clinical research is and the experiential nature of the condition as well as the uniqueness in the experiences with regard to the barriers and facilitators of adherence to ART medications, a quantitative research could not unveil the unique experiences associated with adherence and the psychological demands it places on patients as a more in-depth research by way of qualitative research or better still mixed methods would have done. Hence, future research should consider a mixed method approach to enhance a more vivid view of the issues.

Also, the bureaucratic challenges associated with obtaining ethical clearance and approval for the commencement of the research constituted to why the research was delimited to only HIV positive patients receiving care at the Asankrangwa Catholic Hospital in the Wasa Amenfi West District and aged 18- 65 years.

Definition of Terms

Adherence: Taking prescribed dose of medication at prescribed time.

Acquired Immune Deficiency Syndrome (AIDS): A diagnosis that is made when HIV has damaged the immune system to such an extent that certain opportunistic infections are observed.

Highly Active Antiretroviral Therapy (HAART): The combination of three or more antiretroviral drugs to reduce viral loads and strengthen the immune system.

Human Immunodeficiency Virus (HIV): A chronic infections of the immune system that is mostly transmitted through penetrative sex between men, or between men and women.

Physician-patient relationship: a formal or inferred relationship between a physician and a patient, which is established once the physician assumes or undertakes the medical care or treatment of a patient.

Patient satisfaction: the degree of congruency between a patient's expectations of ideal care and his /her perception of the real care he /she receives.

Perceived social support: the perception of having family, friends and other people to turn to in times of need or crisis.

Organization of the Study

The rest of the study is organized into four chapters. Chapter two (2) covers theoretical, conceptual and empirical review of literature on physician-patient relationship, patient satisfaction, social support and adherence to ART. This is followed by conceptual framework of the study. Chapter three (3) discussed methodology of the study. Research design, study area, population and sampling procedure were discussed. Data collection instruments, data

collection procedure, as well as data processing and analysis were also discussed in this chapter. Chapter four (4) presents the research findings and discussion of findings. Summary of research findings, conclusions and recommendations were discussed in chapter five (5).

Chapter Summary

This chapter generally gave a detailed introduction to the topic under study. It specifically touched on the background to the study, the statement of the problem, purpose of the study, research questions and hypotheses, significance of the study, delimitation, limitations, and definition of terms as well as the organisation of the rest of the chapter.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter addresses the elements of the theoretical/conceptual framework of the study. It explores the key concepts/theories around which the study is built as well as clarifies my interpretation of these concepts/theories in relation to the study. This chapter, therefore, attempts to present a review of the literature that explores the concept of physician-patient relationship, patient's satisfaction, social support and adherence to medication. It would also include a review of the literature on empirical studies that reveals the relationship between these concepts. Specifically, the theoretical review seeks to explore:

- Biopsychosocial model of health (Engel, 1977)
- Four models of physician-patient relationship (Emanuel & Emanuel, 1992)
- Interaction Model of Client Health Behavior (Cox, 1982).
- Structural and Functional support measures (Cohen & Syme, 1985)

The conceptual review will take into account:

- The concept of adherence
- The concept of social support
- Social support and adherence to antiretroviral medication
- The concept of physician-patient relationship

- Physician-patient relationship and adherence to antiretroviral medication
- The concept of patient satisfaction
- Patient satisfaction and adherence to antiretroviral medication

The empirical review also focused on reviewing relevant studies conducted on:

- Physician-patient relationship and adherence
- Patient satisfaction and adherence
- Social support and adherence

Theoretical Review

According to Ambrom (1981), a theory is a set of assumptions or system of beliefs that explain a given natural occurrence. Theories describe or justify how or why something happens by pinpointing key variables and establishing the relationship between them. Below is a review of few important theories underpinning this study.

Biopsychosocial model of health (Engle, 1977)

Biopsychosocial (BPS) model of health focuses on understanding health, illness, and health care delivery through biological, psychological and social factors. The principle of the BPS model states that all issues relating to health are products of a complex interplay of these three factors. This model was developed by Engel (1977). Engel explained this model by emphasizing the distinct aspects of care: the patient; the patient's social context; and the means in place for dealing with illness, namely doctors and the larger system of health care. The biological component focuses on how the cause of illness arises from the functioning of the individual's body with contributing factors

such as genetics, viruses, bacteria and structural defects. The psychological element focuses on psychological causes for a health problem which can be explained in terms of cognition (e.g. expectation of health), emotion (e.g. fear of treatment) and behaviour (e.g. alcohol consumption). The social aspect examines how different social factors such as culture, socioeconomic status, social support, religion among others can influence health.

The BPS model of health is based on Social Cognitive theory. According to Halligan and Arylward (2006), it addresses the argument of the "mind-body connection" which could be understood on the philosophical premise that the working body can affect the mind and vice versa. Therefore, the elements need to be handled together as a growing body. The client's perceptions of health and threat of disease as well as obstacles in the social or cultural environment influence the client's engagement in treatment behaviour (DiMatteo, Haskard, & Williams, 2007).

As explained by Engel, to provide a basis for understanding the determinants of disease and arriving at a rational treatments and patterns of health care, a medical model must also take into account the patient, the social context in which s/he lives and the complementary system devised by society to deal with the disruptive effects of illness, that is, the physician role and the health care system. That is, physicians must not only prescribe a medicinal plan for the patient based on biological etiology and pathogenesis, but also discuss the available interventions with special attention to behaviours and lifestyles that could influence their pain and adherence to the treatment plan. The patient must be involved in formulating and implementing the plan, and maintain a supportive relationship with the physician. The model is therefore

relevant to this present study because it helps us to understand the interaction of biological, psychological and social factors in the treatment of HIV.

Four models of physician-patient relationship (Emanuel & Emanuel, 1992)

The four models were developed by Emanuel and Emanuel (1992) in an attempt to redefine the physician-patient relationship to allow both the physician and the patient take an active role in treatment decision. By so doing, four models were proposed, emphasizing the different understandings of (a) the goals of the physician-patient interaction, (b) the physician's obligations, (c) the role of patient values, and (d) the conception of patient autonomy (Emanuel & Emanuel, 1992). These four models are: the paternalistic model; the informative model; the interpretive model; and the deliberative model.

The paternalistic model

In the paternalistic model, the physician-patient interaction is characterized by the physician ensuring that the patient receives the intervention that best promotes their health and well-being. The physician acts as the patient's guardian. Thus the patient's medical condition, his or her stage in disease process, as well as the medical tests and treatments most likely to restore the patient's health are all determined by the physician based on his or her expertise. This model assumes that there is a shared objective criteria for determining what is best for the patient. Therefore, the physician can discern what is best for the patient with limited patient participation. And in the end, it is assumed that the patient will be thankful for decisions made by the physician even if he or she would not agree to them at the time. According to

Emanuel and Emanuel (1992), the conception of patient autonomy is patient assent, either at the time or later, to the physician's determinations of what is best.

The informative model

In the informative model, sometimes called the scientific, engineering, or consumer model, the physician provides the patient with all the relevant information with regard to his or her medical condition, diagnostic and therapeutic interventions available, risks and benefits associated with the interventions, and any uncertainties of knowledge. Based on the medical information relevant to their disease and available interventions presented to him or her, the patient then selects the interventions that best realize their values. This model also assumes a clear distinction between facts and values. That is the patient's values are well defined known, and that what is lacking is facts. In this case there is no role for the physician's values, his or her duty is to provide all the available facts, and the patient then determines what treatments are best with regard to his or her values. The conception of patient autonomy is patient control over medical decision making (Emanuel and Emanuel, 1992).

The interpretive model

Beyond providing the patient with information on the nature of the condition and the risks and benefits of possible interventions, as in the informative model, however, the interpretive physician aims to assist the patient in clarifying his or her values in order to determine what medical interventions best realize the specified values. That is the physician helps the patient to interpret his or her values. This model assumes that the patient's

values are not necessarily fixed and known to the patient. They are often undeveloped, and the patient may not fully understand them; which may even conflict when applied to specific situations. Based on this, the physician working with the patient must help him or her to interpret, articulate and reconstruct his or her values. In the end, the physician determines which tests and treatments best fit these values. According to this model, the conception of patient autonomy is self-understanding. That is the patient realizes more clearly who he or she is and how the various medical options bear on his or her identity (Emanuel & Emanuel, 1992).

The deliberative model

The objective of the physician-patient interaction in this model is to help the patient define and choose the best health-related values that can be realized in the clinical situation. Just as in the interpretative model, the physician provides patient with information on the nature of the condition and the risks and benefits of possible interventions, assists the patient in clarifying his or her values in order to determine what medical interventions best realize the specified values. By so doing, the physician aims at discussing only health-related values with the patient and proposing why a health-related value is more important and should be aimed at. Also, the physician does not coerce the patient, but in a moral deliberation, he or she engages the patient in judging worthiness and significance of health related values. By engaging in moral deliberation, the physician and patient judge the worthiness and importance of the health-related values. With the patient best interest in mind, the physician does not only indicate what the patient could do, but also indicates what the patient should do, with regards to what medical therapy

would be worthy. The conception of patient autonomy in this model, according to Emanuel and Emanuel (1992), is moral self-development; the patient is empowered not simply to follow unexamined preferences or examined values, but to consider, through dialogue, alternative health-related values, their worthiness, and their implications for treatment.

Any of these four models, according to Emanuel and Emanuel (1992), under different clinical situation may be appropriate and reasonably guide physician-patient relationship. For instance, in an emergency situation where delays in obtaining patient's consent before treatment might harm him or her, the paternalistic model of physician-patient relationship is justifiable. Equally, the interpretative model is most likely justified for dealing with a patient with clear but conflicting values. Again, in a situation where only a one time physician-patient interaction is required, in the absence of an on-going relationship in which the patient's values can be clarified and compared with ideals, the informative model may be necessary. However, in circumstances where a patient medical condition is chronic in nature which requires a long term relationship with a physician, the deliberative model will be more appropriate as it does not only help fit therapies to the patients' clarified values, but also promote health-related values. As noted earlier, this model expects physicians to promote certain values, and persuade patients to be willing to adjust their values and actions to be more compatible with health-promoting values.

The study therefore finds the deliberative model of physician-patient relationship more relevant in that HIV infection has now become a chronic disease with the introduction of HAART which require a long term physician-

patient relationship. As the conception of patient autonomy in this model, according to Emanuel and Emanuel (1992), is moral self-development; the patient is empowered not simply to follow unexamined preferences or examined values, but to consider, through dialogue, alternative health-related values, their worthiness, and their implications for treatment and adherence to treatment.

Interaction model of client health behaviour (Cox, 1982)

The Interactional Model of Client Health Behaviour (IMCHB) was developed by Cox in 1982 in an attempt to fit in each client's individual differences into a systematic and comprehensive structure that examines the multiple determinants of health behaviours. The model consists of three major elements namely: client singularity, client professional interaction and health outcome. Client singularity consists of background variables of patients such as demographic characteristics (e.g., age, gender, and educational level), social influence (e.g., marital status), health care experience (e.g., previous hospitalization) and environmental resources (e.g., health insurance); intrinsic motivation; cognitive appraisal; and affective response.

Client-professional interaction, as proposed in Interaction Model of Client Health Behaviour, consists of four elements that influence patients' health outcomes. The first element of client-professional interaction is affective support; that is attending to the emotion needs of clients. The second element is health information which refers to the availability of knowledge that assists patients understand their health conditions as well as alternatives in managing their health conditions. The third element is decision control; that is the patient's expectations of participating in decision-making about their

healthcare. The fourth element is professional-technical competencies which refer to the skills that are used by health care professionals.

Health outcome consist of five domains: utilization of health care services, clinical health status indicators, severity of health care problem, adherence to the recommended care regimen, and satisfaction with care. According to Cox (1982), the outcome of the IMCHB is health behaviour or a health state resultant from that behaviour.

In this present study, demographic characteristics (e.g., age, gender, educational level) and social influence (e.g., marital status); affective support, health information and decision-making control; are selected as the client singularity and client-professional interaction respectively. These two components of IMCHB are expected to influence the third component, which is health outcome. Satisfaction with care and adherence to recommended care regimen are considered as health outcome in this study.

Structural and functional support measures (Cohen & Syme, 1985)

Cohen and Syme (1985) proposed a distinction between structural and functional support measures. According to them, structural support measures refer to measures that describe the existence of and interconnections between social ties such as marital status or number of relations who know each other. Functional support measures on the other hand assess whether interpersonal relationships serves a particular function such as providing affection, feeling of belongingness, or material aid. This theory is relevant to this study in that it helps in the understanding of how the existence of and the interconnections between social ties, such as marital status, serves as support functions, such as

providing affection or feeling of belongingness, and how these perceived social support influence people to adhere to treatment medications.

Conceptual Review

The conceptual review focuses on the following:

The concept of adherence

Adherence to a medication regimen is defined as the extent to which patients take medications as prescribed by their health care providers (Osterberg & Blaschke, 2005). Not only does adherence to medication imply taking medications as prescribed by health care providers, but also, taking the prescribed doses daily at the prescribed time. Sometimes the word compliance is used in place of adherence, however:

The word "adherence" is preferred by many health care providers, because "compliance" suggests that the patient is passively following the doctor's orders and that the treatment plan is not based on a therapeutic alliance or contract established between the patient and the physician. (Osterberg & Blaschke, 2005, pp. 487).

For medications to be effective in treating diseases, regardless of which word is preferred, patients must follow prescribed treatment regimens accurately. Adherence rate is mostly expressed as the percentage of the prescribed dose of medication taken correctly by a patient over a specific period of time.

Effective treatment of disease with prescription medicines requires consistent use of the medicines as prescribed. Critical for management of chronic diseases, such as diabetes, heart disease, HIV/AIDS and cancer is adherence to medications. Improving adherence holds great potential to

contribute to better health outcomes and more effective chronic care management. Non-adherence to medicines is a major treat to a successful and quality health care, and is directly related to poor clinical outcomes, high health care costs, and lost productivity. While the issue of adherence is important in the treatment of both acute and more importantly chronic diseases, this review specifically focuses on long-term adherence to HIV/AIDS treatment. Unlike other chronic diseases such as diabetes and hypertension where drug resistance is not an issue, the management of HIV consists of complex treatment plan with potentially severe side effects and non-adherence leads to drug resistance. Non-adherence to HAART has severe individual, economic and social consequences. It reduces the effectiveness of HAART and leads to drug resistance, which in turn leads to increased morbidity, mortality and further infections of drug resistance viruses.

According to Leventhal and Cameron (1987), five main perspectives are related to adherence. These are: biomedical; behavioural; communication; cognitive; and self-regulatory perspectives. A more recent perspective, the stage perspective has also emerge which include the transtheoretical model. Below is the discussion of the various theories or models within each perspective in relation to long term adherence to HIV medication, describe their key characteristics and applicability with regard to adherence to HIV medication.

The biomedical perspective

The biomedical approach to health assumes patients to be passive recipients of physicians' instructions and diseases are assumed to have biomedical causes, such as bacteria or viruses (Leventhal & Cameron, 1987).

As result health care delivery is focused on the patient's body and medications are the preferred choice of disease treatment and non-adherence is believed to be caused by patient characteristics such as age and gender. However, this perspective is limited in the sense that it does not take into consideration factors other than patient characteristics that may have effect on health behaviour such as patients' believe about their illness and psychosocial influences. Though this biomedical approach to health has recently been integrated into a larger biopsychosocial model of health emphasized by the World Health Organization (WHO), the model (biopsychosocial) is not positioned rigorously within the biomedical model. Again, since treatment is focus on biomedical factors and patients viewed to be passive, the biomedical approach to health is not likely to have impact on adherence to HAART. Generally, patients are active decision makers and therefore do not just receive and follow instructions passively.

Behavioural (learning) perspective

The behavioural approach to health, according to Leventhal and Cameron (1987), focuses on the environment and the teaching of skills to manage adherence and makes use of the theory of learning, that is, the principles of antecedence and consequences and their influence on behaviour (WHO, 2003). Antecedent is either internal (thoughts) or external (environmental cues) while consequence may be punishment or reward for a behaviour. A patient is likely to act or perform a specific behaviour based on the interplay of these variables (WHO, 2003). Though adherence promoting strategies based on this perspective have been found to be effective (Dunbar, Marshall & Hovell, 1979; Haynes, McDonald, Garg & Montague, 2002), a

meta- analysis assessing adherence to ARV therapy found that interverntions based on approaches derived from the learning theory were sufficient as those without (Simoni, Pearson, Pantalone, Marks & Crepaz,2006).

However, the behavioural learning theory which underpins this perspective has been critiqued for not considering individual thought processes and the influence it has on behaviours that are not linked to immediate rewards (Blackwell, 1992). Again, individual perception of appropriate rewards must also be considered before using this theory as a guide in designing intervention programs on adherence.

Communication perspective

As communication is said to be "the cornerstone of every patient-practitioner relationship" (Deverell & Ross 2004), this perspective proposes that to improve adherence, provider-client communication needs to be enhanced. Communication needs to be clear and comprehensible to be effective and this can be achieved through patient education and good health care worker communication skills; emphasizing on the timing of treatment, instruction and comprehension (Leventhal & Cameron, 1987).

However, this perspective has been criticized base on the fact that it ignores attitudinal, motivational and interpersonal factors that may interfere with the reception of the message and the translation of knowledge into behaviour change (Blackwell, 1992).

Cognitive perspective

This perspective is made up of theories such as the health believe model (HBM), social-cognitive theory (SCT), the theory of reasoned action (TRA), the theory of planned behaviour (TPB), the protection motivation

theory (PMT) and the Information-Motivation-Behavioural skills (IMB) theory. One strength of this perspective is that "these theories focus on cognitive variables as part of behaviour change, and share the assumption that attitudes and beliefs, as well as expectations of future events and outcomes, are major determinants of health related behaviour" (Munro, Lewin, Swart, & Volmink, 2007). The theories also suggest that individuals will choose actions that have the highest probability of leading to positive outcomes. However, they have some weaknesses which includes: involuntary factors which can affect behaviours and the amount of time needed to consciously deliberate on repeated choices; not adequately taken into consideration the skills needed to warrant adherence; and giving little attention to the origin of beliefs and how these beliefs may influence behaviour (Munro, Lewin, Swart, & Volmink).

Health believe model (HBM)

The basic concept of the Health Believe Model (HBM) is that health behaviour is influenced by personal beliefs or perceptions about diseases and strategies available to minimize it occurrence. There are four perceptions that form the main concept of this model, namely: perceived seriousness; perceived susceptibility; perceived benefits; and perceived barriers. The concept of perceived seriousness reflects to the individual's belief about the severity of a disease based mostly on medical information or the belief about effect of the disease on the person's life. Perceived susceptibility is the individual's belief about personal risk or susceptibility to a disease. The higher the perceived risk, the higher the likelihood of the individual to engage in behaviours to decrease the risk. Perceived benefit is how an individual perceives the usefulness of a behaviour to reduce the risk of developing a

disease and it plays a major role the adoption of secondary prevention behaviours such as screening for a particular disease. Perceived barrier is the individual's perception of obstacles in his or her way of behaviour change.

According to this model, combination of perceived seriousness and susceptibility leads to perceived threat of a disease whereas perceived benefit and barrier leads to the perceived effectiveness of the health behaviour. However, these four major concepts underpinning this model are influenced by modifying variables such as demographic and psychosocial variables. Again, HBM emphasizes the role of cue to action in influencing behaviour. This can be external, such as event, people, or things that influences people to change their behaviour; or internal such as symptom perception (Rosenstock, 1974). For instance, knowing an HIV positive individual who became infested with opportunistic infections as a result of not adhering to HAART (external cue), or experiencing a rapid decline in CD4 count (internal cue), can influence an HIV positive person to adhere to HAART. Self-efficacy as a fifth concept or belief was introduced into the HBM in 1988 to incorporate the need to feel competent before carrying out long-term change in behaviour (Rosenstock, Strecher, & Becker, 1988). Generally, one will not try doing something different or new if he/she does not belief in his/her ability to do it.

In conclusion, according to HBM, an individual with high-perceived threat, low barriers and high perceived benefits to action is likely to engage in a recommended behaviour (adherence). This can however be affected by modifying variables, cue to action, and self-efficacy.

Protection motivation theory (PMT)

The Protection-Motivation Theory (PMT) which suggests appealing to an individual's fears as a means to changing behaviour. The theory hypothesized three mechanisms of fear arousal, of which, it is argued, coalesce multiplicatively to regulate the intensity of protection motivation, which result in activity that occur as a result of a desire to protect oneself from danger. These mechanisms are: the magnitude of harm of a depicted event; the probability of that event occurring; and the efficacy of the protective response (Rogers, 1975). As a limitation, Rogers acknowledged that not all environmental and cognitive variables that could impact on attitude change, such as the pressure to conform to social norms, are identified. A recent version of this theory assumes the motivation to protect oneself from danger as a positive linear function of beliefs. That is the belief that the threat is severe, that one is personally vulnerable, that one can perform the copping response (self-efficacy), and that the coping response is effective (response efficacy) (Stroebe, 2000).

Social-cognitive theory (SCT)

The Social-Cognitive Theory (SCT) which evolved from the social learning theory hypothesizes a polygonal causal structure in the regulation of human motivation, action and well-being and offers both predictors of adherence and guidelines for its promotion. Reciprocal determinism which is the continuous, dynamic interaction between the individual, the environment and behaviour, is the basic tenet of behaviour change proposed by this theory. Also, STC acknowledged that while perceived health risks and benefits are essential to change, other self-influences, such as perceived efficacy, are

necessary and play a significant role for change to occur. Perceived facilitators and barriers influence behaviour change, that is, behaviour change may be as a result of the reduction or the elimination of barriers. Health behaviours are also affected by the expected outcomes (which can be positive or negative) of behaviour change, and it could be social (such as social approval or disapproval of action), or self-evaluations (positive or negative) of health behaviour and health status. In a nutshell, SCT suggests that for behaviours to be enacted there should be a positive interaction between perceived barrier, self-efficacy, and outcome. However, operationalization of this theory is difficult and is often used in parts due to its extensive focus, thus its application to intervention development is questionable.

Theory of planned behaviour (TPB) and theory of reasoned action (TRA)

Another theory under the cognitive perspective is the Theory of Planned Behaviour (TPB) and Theory of Reasoned Action (TRA). TRA, being the first work in this area, assumes volitional control as underpinning most socially relevant behaviours, and that the intention to perform a behaviour is the immediate determinant as well as the best predictor of that behaviour (Sutton, 1998). This intention to perform a behaviour is also influenced by attitudes towards the action (e.g., a person's beliefs and evaluations of the outcome of the behaviour); subjective norms (e.g., perceived expectations of significant others) with regards to the person's behaviour; and the person's desire to comply with the wishes of others. However, the TRA ignores the effects of past behaviours on present ones and the fact that behaviours may not always be under volitional control. As a result, the theory was extended to include behavioural control and was termed the theory of planned behaviour

(TPB). Similar to self-efficacy and as a function of control beliefs, 'behavioural control' denotes the perception of ease or difficulty to performing the behaviour. As suggested by Sutton, TRA and TPB requires a more conceptualisation, definition and additional explanatory factors, as attitudes and intentions can also be influenced by a variety of factors that are not delineated in these theories.

Information-motivation- behavioural skills (IMB) theory

Last, but not least under the cognitive perspective is the Information-Motivation-Behavioural skills (IMB) theory which focus on three elements that promote behaviour change, namely: information, motivation, and behaviour skills. As an important requirement for behaviour change, information relays the basic knowledge about a medical condition, though not necessarily adequate in isolation. Motivation reflects a personal attitude towards adherence, perceived social support for the behaviour, and an individual's subjective norm or perceptions of how others with the same condition might behave. Factors such as ensuring that the patient have the skills, tools, and strategies to perform the behaviour as well as a sense of self efficacy constitute the behavioural skills element of the IMB theory. For the desired behaviour to be effective, these elements need to be directly relevant to them, and also, they need to be moderated by a range of circumstantial factors such as living conditions and access to health care. In effect, information and motivation are thought to activate behavioural skills, which in turn leads to reduction in risk behaviour and the maintenance of healthy ones. Though this theory was developed to promote contraceptive use and prevent

HIV transmission, it has been shown to have a predictive value for ART adherence (Amico, Toro-Alfonso & Fisher, 2005)

Self-regulation perspective

The main theory under this perspective is the self-regulatory theory which suggests the importance of examining a person's subjective experience of health threats to understand how s/he adapt to these threats. According to this theory, people form cognitive representations of health threats that combine new information with past experiences. These representations then lead to the selection of particular strategies to cope with health threats, and thereby influencing associated outcomes. The theory assumes that people are active, self-regulating problem solvers, and that individuals are motivated to avoid and treat health threats. According to Edgar and Skinner (2003), this process of creating health threat representations and choosing coping strategies is assumed to be dynamic and informed by a person's personality, religious, social and cultural context. Though this theory seems instinctively appropriate, it offers little direction related to the design of interventions to promote adherence.

In conclusion, it would serve the development of this field to conduct studies to identify variables that best predict behaviour change since most of the theories in the various perspectives share overlapping variables describing using different names, mostly due to an emphasis of one variable over another.

The concept of social support

As complex construct, Social support is difficult to define and measure, but in general it is viewed as a multidimensional construct that includes the sources of support (e.g., who in the social network provides

support), the types of support (e.g., emotional, informational, or tangible), and a person's satisfaction with the support received (Thoits, 1982). Rodriguez and Cohen (1998) refer to social support as the material and psychological resources available to individuals through their interpersonal relationships. Albrecht and Adelman (1987) also defined social support as verbal and non-verbal communication between recipients and providers that reduces uncertainty about the situation, the self, the other, or the relationship and functions to enhance a perception of personal control in one's life experience.

By accepting the World Health Organization's definition of health as physical, mental and social well-being, Cohen and Syme (1985) adopted a broad definition of social support as the resources provided by others. In their view of social support as resources (potentially useful information or things), their definition allows for the possibility that support may have negative as well as positive effects on health and well-being.

As defined by Gottlieb (2000), social support is the process of interaction in relationships which improves coping, esteem, belonging and comprehension through actual or perceived exchanges of physical or psychological resource. Whilst this definition of social support incorporates key features such as interaction, coping, esteem, competence and exchange which are necessary determinants of good health and well-being, it also raises an important aspect of social support as being actual or perceived exchange of physical or psychological resources. With actual support being the kind of support that a person receives in terms of what is said, and/or given, and/or done for that person, perceived social support however refers to an individual's belief that social support is available, is generally considered

positive or negative, and provides what is considered needed by that individual. To Norris and Kaniasty, 1996; Sarason, Sarason, and Pierce, 1990, this support is much more significant than actual support. For instance, a study by Mcdowell and Serovich (2007) of men and women living with HIV/AIDS, perceived social support predicted positive mental health, while the effect of actual social support on their health was minimal.

According to Heller and Swindle (1983), any statement about social support must be qualified by the fact that many different interpersonal processes and construct have been included under the rubric of social support and that each of these has its own unique association with health. Owing to this, Lakey and Cohen (2000) are of the view that any social support study should consider how social relationships influence the way we think, our emotions, behaviours, and biology; and presented three important perspectives on social support. These are: the stress and coping perspective, the social constructionist perspective, and the relationship perspective.

Stress and coping perspective

The stress and coping perspective on social support posits that support influences health and well-being by way of protecting us from the harmful effects of stress. Thus social support reduces the effects of stressful life events on health (i.e., acts as a stress buffer) either through the supportive actions of others (e.g., advice, reassurance), which are thought to enhance coping performance; or through the belief that support is available (perceived support), which also leads to the appraisal of potentially threatening situations as less stressful (Lakey & Cohen, 2000).

The stress-support hypothesis, which states that, social support will be effective in promoting coping and reducing the effects of a stressor, insofar as the form of assistance matches the demand of the stressor is probably the most explicit statement of how supportive actions should promote coping (Cohen & McKay, 1984; Cutrona & Russell, 1990). This implies that each stressful circumstance places specific demands on the affected individual, and to promote coping, there must be the right form of social support.

Alternatively, social support might protect individuals against the adverse effect of stressors by leading them to interpret stressful situations less negatively (Cohen & McKay, 1984). According to the theory of stress and coping, how people interpret (appraise) situations is very important in determining an event's stressfulness (Lazarus, 1966; Lazarus & Folkman, 1984). Appraisal can be primary or secondary. Whilst primary appraisals involve the judgment of weather an event is a threat, involving questions such as "Am I in trouble?", secondary appraisals involve evaluation of personal and social resources available to cope with the event, which also involve questions such as "What can I do about it?". To Lazarus and Folkman, more negative appraisals lead to greater emotional distress. The belief that support is available reduces the effects of stress by contributing to less negative appraisal (Cohen & Hoberman, 1983). As with supportive actions of others (received support), the belief that support is available (perceived support) should be most effective in altering appraisal if they counter the specific needs provoked by the stressful event.

Social constructionist perspective

The social constructionist involves social cognition and symbolic interactionism, which are two different views in terms of their recent intellectual tradition and method, but share common origins in pragmatist philosophy and therefore share many core assumptions (Barone, Maddux & Snyder, 1997). According to Dewey (1917, 1997), social constructions refer to assumption that people's perceptions about the world do not reflect ultimate reality, instead, people construct theories and concepts about the world that reflect their social context. But for Kelly (1969), because there is frequently no clear social consensus, there are important individuals and groups differences in how people interpret their world.

This perspective, according to Mead (1934), firstly suggests that there is no clear consensus across individuals or groups as to what constitutes supportive behaviours. Secondary, it predicts that the self and social world (including social support) are inextricably linked; that is, the experience of "self" is largely a reflection of how one is viewed by others.

As a modern manifestation of social constructionism (Barone, Maddux & Snyder, 1997), social cognition has been extensively used by other authors to understand social support (Lakey & Cassady, 1990; Sarason, Sarason & Pierce 1990). Social-cognitive views of social support assumes that once a person develops stable beliefs about the supportiveness of others, day to day thoughts about social support are shaded to fit these pre-existing beliefs. Thus the primarily concern of social cognitive views of social support is with the perception of support.

In relation to health, social cognitive view of social support is based on the cognitive models of emotional disorders (Beck, Kovacs & Weissman1979), in that negative thoughts about social relations are thought to overlap with and stimulates emotion distress (Lakey & Cassady, 1990), and that priming cognitive representations of different social relations influences self-evaluation (Baldwin, Carrell, & Lopez, 1990; Baldwin & Sinclair, 1996). For example, Lakey and Cassady provide evidence that perceived support is strongly associated with self-evaluation.

In addition to social cognition, symbolic interactionism is another modern manifestation of social constructionism (Stryker, 1980). According to Thoits (1985), the basic tenet of the symbolic interactionism perspective on social support is that the regularization of social interaction, rather than the provision of support per se, is responsible for the maintenance of well-being. Thus by providing people with a way of making sense of the self and the world, our social environments, according to the symbolic interactionism perspective, directly promote health and well-being. Based on this, Lakey and Cohen (2000) are also of the view that social support operates by helping people to create and sustain identity and self-esteem.

According to Mead (1934), self-criticism is essentially social criticism, and behaviour that is conducted by self-criticism is essentially behaviour controlled socially. Thus people learn to regulate themselves by applying the standards of the group to their own conduct. This aspect of constructionist thought, according to House, Landis and Umberson (1988), provides a mechanism for facilitating behaviours that could promote health, such as

physician visits or increased exercise, and inhibiting behaviours that might be detrimental to health, such as excessive alcohol and tobacco consumption.

Relationship perspective

The relationship perspective of social support is the relationship perspective. According to Lakey and Cohen (2000), rather than this approach representing a clear perspective linked to a pre-existing research literature or intellectual tradition, it represent a group of hypothesis that attributes social support to other relationship qualities or processes. Thus it reflects neither actual helping during times of stress nor beliefs about the support. This perspective is believed will become increasingly important and provide alternative ways of thinking about social support (Lakey & Cohen).

One hypothesis that can be drawn out of this perspective by Bowlby, (1969); Leary and Downs, (1995) is that positive, stable and secure relationship may fulfil a basic biological need. In the past, human in isolation were probably quickly eaten up by other animals, killed by other humans or starved, thereby making human survival depended upon integration to social group. Therefore recognizing that one is not accepted by the social group or that the social group would not come to one's aid if needed can lead to almost certain death. Isolation then may be strongly tied with lower self-esteem and control and to heightened levels of negative affect (Lakey & Cohen 2000).

Social support and adherence to antiretroviral medication

It has been widely acknowledged that social relationships and affiliation have powerful effects on physical and mental health and well-being (Berkman, Glass, Brissette, and Seeman 2000). Research also has it that people who are isolated or marginalized socially turn to be less healthy both

physically and psychologically (House, Landis, & Umberson, 1988). The availability of social support plays a major role in the ability of the psychosocial adjustment of patient towards chronic disease because it contributes to the reconstruction of thoughts and finding solutions to the immediate crisis response (Tsaousoglou & Koukourikos, 2007). People usually turn to the wider social environment to seek available assistance in order to cope with the stressful events of their disease. According to Derlega, Winstread, Oldfield, and Barbee (2003), social support has been found to be a major buffer in coping with HIV/AIDS-related stressors.

Both social support and coping are known factors influencing the outcomes of chronic illness, and many studies have focused on the roles social support and coping may play in medication adherence within the context of HIV disease (Cox, 2002). For instance, Lazarus & Folkman, (1984) hypothesized social support as one of a number of antecedent stress resistance resources that contribute to positive adaptational outcomes. According to Vyavaharkar et al (2007), an important adaptational outcome for HIV disease is medication adherence, and receiving emotional, informational, and/or tangible support from others in the face of a stressful situation is a major factor mediating such outcomes. Individuals who have access to resources such as social support are more likely to be effective in managing stressful situations and less likely to experience poor outcomes and vice versa (Lazaru & Folkman). Again, social support has been found to mitigate depressive symptoms of HIV-positive individuals (Hudson, Lee, Miramonte & Portillo, 2001).

Many studies in the past have examined the association between availability of social support and HIV medication adherence. Cox, (2002) found emotional support to be a significant predictor of medication drug adherence among persons with HIV disease. Other studies found perceived social support to be a significant predictor of compliance (Gordillo, del Amo, Soriano & González-Lahoz 1999; Catz, Kelly, Bogart, Benotsch, & McAuliffe, 2000). Some studies have examined how coping strategies influence medication adherence in individuals with HIV disease. In one such study, Heckman, Catz, Heckman, Miller & Kalichman (2004) found active coping strategies to be positively associated with medication adherence.

The concept of physician-patient relationship

According to Stavropoulou (2012), the physician-patient relationship is generally viewed as an agency one in health economics, where the doctor acts as an agent maximizing the patient's (i. e., the principal's) utility, by holding more information about the patient's health status and the available treatments (Arrow, 1963). Arrow again argued that the patient, on the other hand, having superior knowledge about how these treatments fit with his/her lifestyle and specific beliefs about illness and medications, communicates his/her preferences to the physician, who then acts as an agent for the patient. In this case (the principal-agent theory or the perfect agency model), the physician maximizes the patient's utility as if it were his/her own (Stavropoulou). Though this model has been used extensively in health economics because of its conceptual simplicity and a lack of any agreed alternative (Stavropoulou), it has limitations and criticisms. For instance, according to Barry, Bradley, Britten, Stevenson and Barber (2000), both the physician and the patient bring

to the consultation different agendas and that the physician is very often unable to understand the patient's needs. To Stavropoulou, when the needs of the patient are not met, the outcomes of the consultation are unsatisfactory, and the patient may not adhere to the physician recommendations. Aside the patient needs, the physician has other constraints that need to be considered, such as administrative constraints, time issues and personal costs and benefits. Charles, Gafni and Whelan (1999) have also proposed an alternative which is similar to the informed model of decision making whereby the physicians pass the information to the patients, who now being perfectly informed can choose what is the best option for them with reference to their own preferences.

Another perspective on physician-patient relationship is the medical sociology perspective under which three theoretical models has been proposed to describe the physician-patient relationship with regard to decision making. These are paternalism model, shared decision model, and the informed decision making model. Under the paternalism model (Charles, Gafni and Whelan, 1999), the patient is passive and has no active involvement in decision making. On the other hand, the physician, who is an expert, diagnoses the patient and decides on the appropriate treatment. Coulter (2002) also calls this model 'professional choice', which according to him, it may be appropriate under some circumstances for the physician to make decisions without the patient's active involvement.

Another model in the medical sociology perspective is the shared decision model by Charles, Gafni and Whelan (1999). They reasoned that four specific characteristics should be present for shares decision making to be effective. These are: 1. Both the physician and the patient are involved, to

some extent, in the decision-making process. (2). Both parties share information. (3). Both take steps to participate in the decision-making process by expressing treatment preferences. (4). Both the physician and the patient agree on the treatment option to be adopted. Though both the physician and the patient are active members in the decision-making process, this model has limitations. For instance, a study by Stevenson, Barry, Britten, Barber and Bradley (2000) revealed that there is little evidence that both physicians and patients participate in consultation in a way as described in this model.

Last, but not least in the medical sociology perspective is the informed decision making model which is often presented together with the shared decision model, though Gafni, Charles and Whelan (1998) argue that they have essential differences mainly with the of exchange information. Whilst the flow of information in the shared decision making is two-sided, as both the patient and the physician exchange information, the flow of information in the informed decision making is one-sided, with the physician providing the medical information to the patient. Again, the final decision is a common agreement between both the patient and the physician in the shared decision model, whilst the patient who makes the decision in the informed decision making model.

Physician-patient relationship and adherence to medication

According to Haynes, Taylor, and Sackett (1979), initially the term 'compliance was mainly used when adherence was perceived as the patient's obedience to the physician's medical decision. Given the models of physician-patient relationship described above, the paternalistic model best relates to the concept of compliance and barriers to compliance were considered to be

socio-demographic factors such as age and educational background (Stavropoulou, 2012). But studies in recent times suggest an approach to the issue that does not put much blame on the patient and also a preference to the term 'adherence' by most researchers and policy makers. In this regard, the informed decision making model relates more to the concept of adherence, in that the patient play an active role by deciding whether or not to follow the physician's recommendations, after being well informed by the physician (Stavropoulou). That is, when individuals feel that they were involved in the decision making process with regards to their health or medical status and are treated as equals by their physician, there is a greater chance that they will adhere to treatment medication. For instance, in a study by Ironson, Lucette and McIntosh (2015) on "Doctor-Patient Relationship: Active Patient Involvement (DPR: API) is related to long survival status and predicts adherence change in HIV", it was revealed that long survivors were significantly higher on active patient involvement than the normal course HIV controls, and that patients who were more involved early in treatment became more adherent to ART after one year. Kerse et al. (2004) also found in their study that only trust and physician-patient concordance were significantly related to compliance. Similarly, Roberts (2002) in her study also found out that good quality physician-patient relationships tended to promote adherence while lesser quality relationships impeded it.

The concept of patient satisfaction

According to Gill and White (2009), critical to developing service improvement strategies is the understanding of satisfaction and service quality though there is rarely any theoretical or conceptual development of the patient

satisfaction concept, and that the construct has little standardization, low reliability and uncertain validity. However, to Hawthorne (2006), the 1980s saw the publications of the major patient satisfaction theories which have been largely restated in recent times. Among these theories are: discrepancy and transgression theories, expectancy-value theory, determinants and components theory, multiple models theory, and the healthcare quality theory.

Fox and Storms (1981) developed the discrepancy and transgression theories and advocated that if orientations and conditions were congruent, then patients were satisfied as patients' healthcare orientations differed and provider conditions of care differed, if not, then they were dissatisfied. Similarly, Linder-Pelz (1982) hypothesized satisfaction to be mediated by personal beliefs and values about care as well as prior expectations about care. Linder-Pelz went on to identify the important relationship between expectations and variance in satisfaction ratings and offered an operational definition for patient satisfaction as "positive evaluations of distinct dimensions of healthcare" (p578). Whilst Pascoe (1983) extended the Linder-Pelz model to take into account the influence of expectations on satisfaction, Strasser, Aharony, and Greenberger (1993) went further to create a six factor psychological model: cognitive and affective perception formation; multidimensional construct; dynamic process; attitudinal response; iterative; and ameliorated by individual difference.

Ware, Snyder, Wright and Davies (1983) also view patient satisfaction as a function of patients' subjective responses to experienced care mediated by their personal preferences and expectations. But Fitzpatrick and Hopkins (1983) argued that expectations were socially mediated, and that they reflect

the health goals of the patient and the extent to which illness and healthcare violate the patient's personal sense of self. Donabedian (1980) also proposes that satisfaction is the principal outcome of the interpersonal process of care and that the expression of satisfaction or dissatisfaction is the patient's judgment on the quality of care in all its aspects, more particularly in relation to the interpersonal component of care.

According to Hawthorne (2006), there is no agreed definition of patient satisfaction and Gill and White (2009) has highlighted this point that the construct has inadequate conceptualisation and that there has not been a significant change since the 1970s. Crow et al. (2002) also agreed that there is no definitive conceptualisation of satisfaction with healthcare and that the understanding as to how a patient becomes satisfied or dissatisfied is unknown thereby suggesting that satisfaction is a relative concept and that it only implies adequate service. Again, Crow et al. maintain that patient satisfaction is a cognitive evaluation of the service that is emotionally affected, and it is therefore an individual subjective perception and that the most important determinants of satisfaction are the interpersonal relationships and their related aspects of care. Also, Wouters, Heunis, van Rensburg and Meulemans (2008) also defined patient satisfaction as a patient's general orientation towards a total experience of health care. In other words, it is the extent to which the health care experience matches the patient's expectations of health care (Preau et al., 2012). To Heidegger, Saal & and Nuebling (2006), patient satisfaction forms part of health outcome quality which also incorporates the clinical results, economic measures and health related quality of life.

Patient satisfaction and HIV medication adherence

The concept of satisfaction has appeared in many fields such as the business world which has offered a framework for increasing retention by focusing on customer satisfaction and office evaluation by employee satisfaction. According to Aigbavboa and Thwala (2013), satisfaction has been fundamental to the marketing concept for over three decades; as the most extensive use of satisfaction has been in literature concerned with customer satisfaction. Mittal and Frennea (2010) also agree that marketing studies clearly show that high satisfaction levels have a positive impact on customer loyalty, repeat patronage, and more extensive and favourable referrals.

In relation to the business model of customer satisfaction and retention, patient satisfaction could serve as an innovative focus for increasing retention in HIV care and adherence to HAART. According to Dang, Westbrook, Black, Rodriguez-Barradas, and Giordano (2013), patient satisfaction has a positive impact on retention in care, which is vital for HIV/AIDS programs. As suggested by Wouters et al. (2008), patient satisfaction is crucial for a HIV/AIDS program to be successful with a strained health system and to maximise the benefits of scarce resources.

Empirical Review

With varied purposes and methodology, several studies have been conducted to provide evidence to establish the relationship among several antiretroviral medication adherence variables. This study therefore reviews some of these related studies, with focus on physician-patient relationship, patient satisfaction social support and adherence.

Physician-patient relationship and adherence to ART

According to Strasser (1992), the physician-patient relationship is integral to the successful delivery of primary health care. Several studies have supported he belief that good physician-patient relationships are associated with better adherence to antiretroviral regimens for HIV infection is widespread. For instance Schneider et al (2004) in their study to determine whether and which aspects of a better physician-patient relationship are associated with higher rates of adherence with antiretroviral therapies for persons with HIV infection, found that in multivariable models that accounted for the clustering of patients within physicians' practices, six of the seven physician-patient relationship quality variables were significantly associated with adherence. In a cross-sectional design using twenty-two outpatient HIV practices in a metropolitan area with five hundred fifty-four patients with HIV infection taking antiretroviral medications, their study measured adherence using a 4-item self-report scale. They measured core aspects of physician-patient relationships using 6 previously tested scales (general communication, HIV-specific information, participatory decision making, overall satisfaction, willingness to recommend physician, and physician trust) and one new scale, adherence dialogue. For adherence dialogue, patients rated their physician at understanding and solving problems with antiretroviral therapy regimens.

Ironson, Lucette and McIntosh (2015) also conducted studies to examine the application of the Doctor-Patient Relationship: Active Patient Involvement (DPR: API) scale, a 5-item scale, in predicting relevant health outcomes among HIV positive patients. In Study 1, they compared active patient involvement between long survivors (those who survived more than

twice as long as expected after getting an AIDS defining symptom) and normal course controls (HIV positive patients). Study 2, which was a longitudinal study, followed the normal course controls to determine whether active patient involvement at baseline would predict adherence to combination antiretroviral therapy (ART; percentage of missed doses) using the AIDS Clinical Trials Group scale (ACTG) at one-year follow-up. The result in Study 1 showed that long survivors were significantly higher on active patient involvement than the normal course HIV controls. Using a hierarchical multiple regression models, the result of study 2 showed that patients' involvement in their care at baseline significantly predicted change in percentage of missed doses one year later, such that patients who were more involved early in treatment became more adherent to ART after one year.

Again, in exploring the connections between human immunodeficiency virus (HIV) positive patients adherence to antiretroviral medication treatment regimens and their beliefs about and satisfaction with their primary care physicians, Roberts (2002) in an In-depth interviews conducted with 28 HIV-positive patients revealed that most patients were extremely satisfied with their current primary care physicians, and that good quality physician-patient relationships tended to promote adherence while lesser quality relationships impeded it. Kerse et al. (2004) also found in their study that only trust and physician-patient concordance were significantly related to compliance.

Further, Aragonés, Sánchez, Campos and Pérez (2011) in their study to measure levels of treatment adherence and its predictive factors in persons with HIV/AIDS receiving antiretroviral therapy, using a cross-sectional study

with Cuban HIV-positive individuals receiving antiretroviral therapy in 2006 found that, 70.6% of the participants self-reported high adherence. Using a logistic regression modelling, they found no significant differences between highly adherent and less adherent patients with regard to sex, place of residence, treatment setting, time of diagnosis, or length of treatment. The variables that were associated with high adherence were communication with the specialist physician, change in treatment, memory, self-efficacy, as well as commitment to and opinions about treatment. Their study used a sample size of 876 which was calculated using two-stage sampling (first by strata, and then by simple random sampling in each stratum), and an anonymous structured questionnaire was administered to the participants.

Patient satisfaction and adherence to ART

In the year 2000, the World Health Organization (WHO) identified meeting individuals' universally legitimate expectations as a key health system objective (WHO, 2000). This marked an increase importance in the study of Patient satisfaction for measuring the quality of health services and are routinely used in developed countries for continuous quality improvement and value-based incentive payments (Dempsey, Reilly & Buhlman, 2014), some of which have also linked satisfaction to treatment adherence for HIV patients, which has important implications for individual patient outcomes and preventing resistance to antiretroviral drugs (Roberts, 2002).

Dang, Westbrook, Black, Rodriguez-Barradas, and Giordano, (2013) conducted a study to test, through structural equation modelling (SEM), a model of HIV suppression in which patient satisfaction influences HIV suppression indirectly through retention in HIV care and adherence to

HAART using a cross-sectional study of adults receiving HIV care at two clinics in Texas. It was found that patient satisfaction with care influences retention in HIV care and adherence to HAART, which in turn serve as key determinants of HIV suppression.

Levitz (2014) also explored the determinants of patient satisfaction, looked for an association between patient satisfaction and retention in care, and investigated the relationship between patient satisfaction and viral load suppression for those currently in care. The study used data from a broader study conducted in Uganda and Kenya from 2011 to 2013 by the Institute for Health Metrics and Evaluation at the University of Washington, called the Access, Bottlenecks, Costs and Equity study (ABCE). It was revealed that patient satisfaction was related to facility retention in HIV care, but it was not related to HIV viral load suppression for those who were currently in care.

Bakar, Fahrni and Khan (2015), with the aim to determine the satisfaction and current adherence status of diabetes mellitus patients at the diabetes MTAC (DMTAC) and the relationship between patient satisfaction and adherence using a cross-sectional descriptive study out at three government hospitals in the state of Johor, Malaysia, found a significant positive fair correlation between the satisfaction and adherence and that out of 165 participants, patients, 87.0% of patients were satisfied with DMTAC service (score 60-100) with mean scores of 76.8. On the basis of MMAS, 29.1% had a medium rate and 26.1% had a high rate of adherence.

Social support and adherence to ART

According to Cohen (1988) and Helgeson & Cohen (1996), Social support is an important factor in immune, endocrine, and cardiovascular

functioning; recovery from illness and injury; and health maintenance. Though it has not yet been understood the precise means by which social support contributes to health and the factors that mediate and moderate this relationship (Stone, Mezzacappa, Donatone, & Gonder, 1999), however, a lot of studies have been carried out to establish the relationship between social support and health, and for that matter HIV and adherence to antiretroviral medication. For instance, in a correlational and quantitatively designed study, using an ex post facto cross-sectional secondary data analysis to discover which social support and which mediating variables might be associated with good medication compliance for people living with HIV disease, Cox (2002) found that having emotional support and being employed seemed to be predict good compliance.

Vyavaharkar et al. (2007) also in their study to examined the relationships among sociodemographic factors, social support, coping, and adherence to antiretroviral therapy (ART) among HIV-positive women with depression revealed that Satisfaction with social support, and coping focused on managing HIV disease were the best positive predictors medication adherence. In a cross-section longitudinal study designed to test the efficacy of a peer-based social support intervention designed for rural women with HIV disease and depression, the analyses were limited to the 224 women receiving ART of 280 women recruited from community-based HIV/AIDS organizations serving rural areas of three states in the south-eastern United States.

Again, DiMatteo (2004), in a review of the literature from 1948 to 2001, found 122 studies that correlated structural or functional social support

with patient adherence to medical regimens. Using meta-analyses, a significant average r-effect size between adherence and practical, emotional, and unidimensional social support; family cohesiveness and conflict; marital status; and living arrangement of adults was established. Further, it was revealed that practical support bears the highest correlation with adherence and adherence was also 1.74 times higher in patients from cohesive families and 1.53 times lower in patients from families in conflict. Marital status and living with another person (for adults) was also found to increase adherence modestly.

Furthermore, Pichon, Rossi, Ogg, Krull and Young Griffin (2015) explored the association of HIV medication adherence to satisfaction with support from family, friends and church members, as well as HIV-related stigma, and HIV disclosure. Pichon et al. (2015) employed a mixed-methods approach, using community-based participatory research to conduct the 2012 Needs Assessment for the Memphis Transitional Grant Area (TGA) Ryan White Program. This study however focused exclusively on the quantitative analysis and when the relationship between social support with adherence was examined, it was found that approximately 43% of those who received support/reminders from friends/family for medication took all of their doses over a seven day period compared to 57% who did not receive this support.

Adherence to ART medication

A study on the Predictors of Adherence to Antiretroviral Therapy among HIV/AIDS Patients in the Upper West Region of Ghana by Obirikorang, Selleh, Abledu, Fofie (2013), using the descriptive cross-sectional study with 201 confirmed HIV1 seropositive patients in the Upper

West region of Ghana, found an overall lifetime adherence was found to be 62.2% while medication adherence in the last six months, last three months, last month, and last week were 73.6%, 87.1%, 91.0%, and 86.0%, respectively. Their study also revealed a positive association between self-perceived wellness, family support, and regular followup, and adherence to ART. The data was analyzed using a univariate logistic regression analysis.

Amankwah (2015), in her study to find out the facilitators and barriers to antiretroviral therapy adherence among HIV/AIDS patients in a multi-case study of Sunyani regional and municipal hospitals, found a 100% adherence among participants in three days assessment, but 25% did not take medication fully in the seven day's assessment. The main facilitators of adherence to ART according to her study comprised: existence of support; health promotion activities; free supply of ARVs; and cordial relationship with health professionals. Adherence barriers were: transportation cost; cost of non-ARVs; delay in service delivery; and different schedules for drugs and consultation. A mixed method approach was used to collect data, and a purposive sampling was use to select 141 respondents. The quantitative approach saw questionnaires administered to 120 respondents, and with the qualitative approach, an in-depth interviews were conducted for 5 health professionals while 16 others were selected for focus group discussions. The quantitative data was analysed using Chi square analysis while qualitative data was transcribed and analysed thematically.

Ohene and Forson (2009), in their study to assess the characteristics of a crosssection of HIV infected persons receiving treatment from the Antiretroviral Therapy (ART) clinic in Komfo Anokye Teaching Hospital

(KATH) in Kumasi using a structured questionnaire , found that out of 227 participants, 80.6% of them had never missed a dose of their drugs since starting treatment. About half of the respondents (51%) said the cost of the treatment was not affordable and seven out of ten (73.6%) waited 3 hours at the clinic before being attended to.

Ocansey (2009), in a study to measure and identify factors that contributes to optimal adherence to ART among HIV patients (PLWHA) at the Korle Bu Teaching Hospital (KBTH) found an overall rate of adherence to be 92% and quality of care was found to be a factor that contributes to optimal adherence. The study design was a cross sectional descriptive study which used systematic sampling to collect quantitative and qualitative data from adult ARV users who have been on ARTs for at least three months and attended clinic between May and July 2009. A t-test was performed to compare mean adherence and Multivariate logistic regression was used to determine factors that were associated with adherence. Analysis included 229 patients

Conceptual framework of the study

From the review of literature above, the relationship between the various variables under investigation have been illustrated in a conceptual framework that is presented in figure one. The figure indicates expected relationships between the variables used in the study. From figure 1, it is expected that physician-patient relationship will influence adherence to medication as it is believed that when individuals feel that they were involved in the decision making process with regards to their health and are treated as equals by their physician, there is a greater chance that they will adhere to

treatment medication (Stavropoulou, 2012). Social support has also been hypothesized as one of a number of antecedent stress resistance resources that contribute to positive adaptational outcomes (Lazarus & Folkman, 1984), and according to Vyavaharkar et al (2007), an important adaptational outcome for HIV disease is medication adherence, and receiving emotional, informational, and/or tangible support from others in the face of a stressful situation is a major factor mediating such outcomes. Therefore, in this study, it is expected that if patients are given the needed social support, they will adhere to their medication. Finally, as maintained by Crow et al. (2002), patient satisfaction is a cognitive evaluation of the service that is emotionally affected, and it is therefore an individual subjective perception and that the most important determinants of satisfaction are the interpersonal relationships and their related aspects of care. Given this, it is expected in this study that when patient are satisfied with their interpersonal relationships with family, friends and significant others, as well as with their health related aspect of care, especially their relationship with physicians, they will adherence to medication.

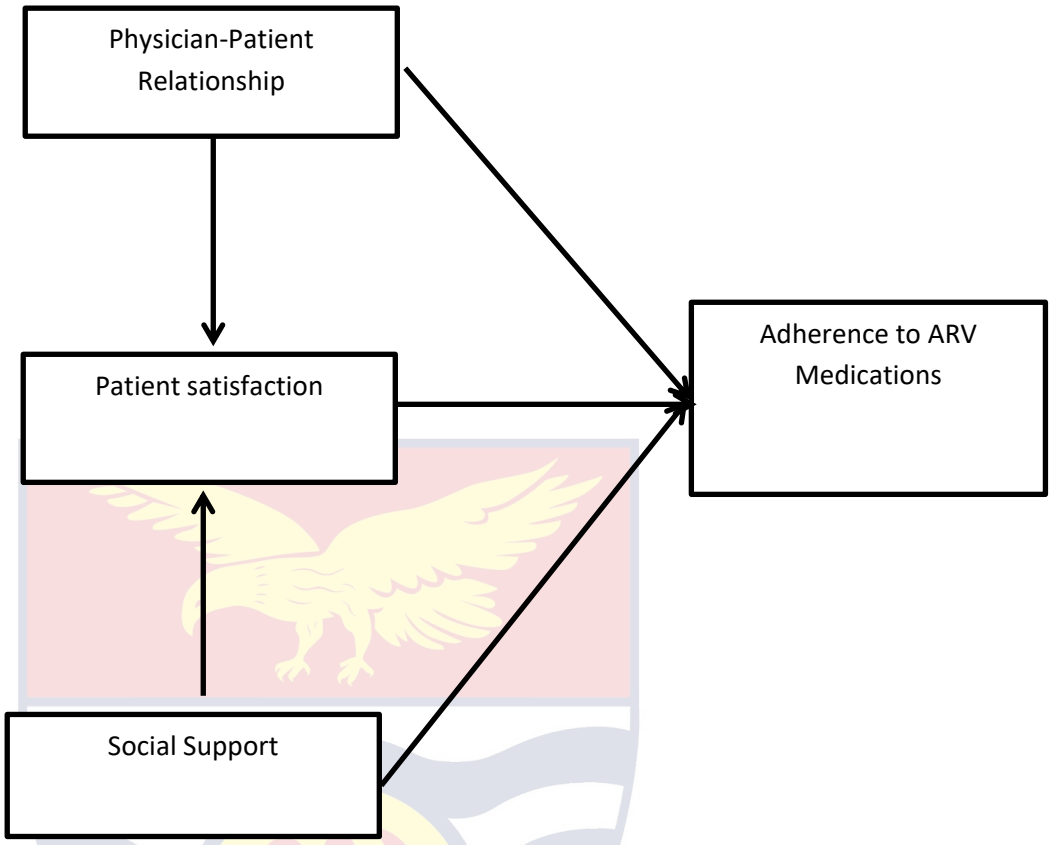

Figure 1: Conceptual framework for the study

Source: Field work (2018)

Chapter Summary

This chapter has reviewed a number of broad concepts related to issues on adherence to ARV medication. The review was done under three main headings thus theoretical review, conceptual review and empirical review. Theoretical review looked at Biopsychosocial model of health, Four models of physician-patient relationship, Interactional model of client health behaviour and structural and functional support measures. The conceptual review also took into account the concept of adherence; social support and adherence; physician-patient relationship and adherence; and patient satisfaction and adherence. The empirical review examined some related studies conducted on

physician-patient relationship, patient satisfaction, social support and adherence to ARV medication.

CHAPTER THREE

RESEARCH METHODS

Introduction

The study sought to investigate the relationship between physician-patient relationship, patient satisfaction, social support and HIV/AIDS medication adherence among HIV/AIDS infected adults in the Wasa Amenfi West district in the Western region of Ghana. This chapter discusses the research methods that were employed for the study. Specifically, the research design, study area, population, sample and sampling procedure, data collection instrument, data collection procedure, as well as data processing and analysis will be discussed in this chapter.

Research Design

The researcher employed a quantitative approach, specifically descriptive survey design which studies phenomenon in their natural settings (Creswell & Creswell, 2005). This design was used to determine the nature of physician patient relationship, patient satisfaction and social support available to HIV patients and their level of adherence to ARV medications. Descriptive survey design is advantageous to use because it helps gather routine health related information and the investigation of possible relationships that exist between variables (Barratt & Kirwan, 2009). The survey research design gave the researcher the opportunity to learn about the larger population from which the sample is drawn by collecting detailed and factual information that describe the existing phenomenon within the target population. The survey

design was considered the most appropriate method due to the researcher's intention to achieve external validity and to adapt findings of the study to other similar populations. This design was also to enable the researcher authenticate any observations and suggestions that may be considered useful for future research, policy formulation and implementation. This design was to enable the researcher achieve these due to its methodological appropriateness in evincing the characteristics of the population under study. However, the survey research design, though will enhance generalizability, will not help explore the phenomenon to a greater depth like would have been ideal.

Study Area

This study was carried out at the ART center of the Asankrangwa Catholic Hospital (also known as Fr. Thomas Alan Rooney Memorial Hospital) which serves as the district hospital in the Amenfi West District.

Located in the middle part of the Western Region of Ghana and with a total land area of 1,448.56 square kilometres, the Amenfi West District (which was part of the former Wassa Amenfi District) was established under the Legislative Instrument 1757 in 2004 (Ghana Statistical Service, 2014). With Asankrangwa as its capital, the district is bounded to the East, West and South by Prestea Huni Valley and Wassa Amenfi Central districts, Sefwi-Akontombra and Aowin districts, and Jomoro, Ellembelle and Nzema East districts respectively. Though there are other minor ethnic groups such as Nzema, Sefwi, Asante and Akyem, the dominant ethnic group in the district is Wassa and Twi is the predominant language spoken by the people in the district. Culturally, the Wassa are homogeneous with respect to lineage,

succession and like other Akans, inheritance is through matrilineal lineage (Ghana Statistical Service, 2014).

With agriculture as its main economic activity, the district is known for the growing of both cash crops (mostly cocoa, oil palm, and rubber) and food crops (cassava, maize, rice, garden eggs and tomatoes). Further, the district has two major markets at Asankrangwa and Samreboi, with other satellite markets like Mumuni, Breman, Kwabeng and Wassa Dunkwa that contribute to the economic activities in the district. It also has one commercial wood industry, Samatex Timber Company Limited at Samreboi. Financial institutions in the district include the Republic (formally HFC) Bank at Asankrangwa and Ghana Commercial Bank at Samreboi and three (3) rural banks (Ghana Statistical Service, 2014).

The Amenfi West District has 900km length of feeder roads which are generally in a deplorable state with only 40.9km tarred. Due to the poor nature of the roads, the carting of agricultural and timber products to other major markets in the district and other towns outside the district is problematic, especially during the raining season (Ghana Statistical Service, 2014).

In terms of education, the district has 118 Pre-School/Kindergarten (88 public and 30 private) schools, 119 Primary (89 public and 30 private) schools, 62 junior high (41 public and 21 private) schools, two senior high schools, namely Asankrangwa Senior High School and Asankrangwa Senior High Technical School and one Community Health Assistant and Midwifery Training Institute. The Roman Catholic Hospital at Asankrangwa and Samatex Hospital at Samreboi are the major hospitals in the district but also within the various communities in the district are other thirteen (13) public health care

facilities and one private clinic (Ghana Statistical Service, 2014). The catholic hospital purposefully was chosen for the study because of the availability of the ART centre, which other health facilities in the district do not have.

Population

The target population for the study was the entire number of patients who receive antiretroviral medication at Asankrangwa Catholic Hospital ART centre. This, according to the hospital's record, includes 606 adults and 30 children. However, since the study was interested in HIV infested adults, the accessible population was 606 from which the sample for the study was taken.

Sample and Sampling procedure

A sample size of 234 participants was selected for the study. This number is justified based on the recommendations made by Krejce and Morgan (1970). According to Krejce and Morgan, in order to obtain results that are true representation of the population of 600 people, (with 95% level of confidence) at least 234 people should be chosen.

The convenience sampling technique was used to select the 234 participants for the study. Convenience sampling involves choosing the nearest individuals to serve as respondents and continuing the process until the required sample has been obtained or those who happen to be available or accessible at the time (Cohen, Manion & Morrison, 2007). This technique was chosen because the participants in the study were out-patients and only visited the facilities when it was time for their review.

Inclusion criteria

Since the study sought to investigate the relationship between physician-patient relationship, patient satisfaction, social support and

HIV/AIDS medication adherence among HIV/AIDS infected adults, all patients (aged 18 years and above and not more than 65 years) who had been on ART for at least three months and were willing to be part of the study were eligible for inclusion.

Exclusion criteria

HIV patients (aged below 18 years and above 65 years) who had been on ART for less than three months and patients (aged 18 years and above and not more than 65 years) who are unwilling to participate in the study were excluded.

Instrument for Data Collection

The following scales were adapted to collect quantitative data from the research participants

Multidimensional scale of perceived social support MSPSS (Zimet, Dahlem, Zimet & Farley, 1988).

This scale is a 12 item ratings made on a five point Likert type scale ranging from strongly disagree (1) to strongly agree (5). This scale was designed to measure perceived adequacy of support from family (items 3, 4, 8 & 11), friends (items 6,7,9 & 12) and significant others (items; 1,2,5,&10). Cronbach coefficient alpha was reported to range from .85 to .91 for each subscale and the scale as a whole indicating a good internal reliability (Zimet, Dahlem, Zimet & Farley, 1988).

Patient satisfaction questionnaire PSQ short form (Marshal & Hays, 1994)

This is an 18-item instrument developed with a preset 5 point Likert scale ranging from strongly agree to strongly disagree of responses. The scale measures 7 dimensions of satisfaction with medical care (general satisfaction,

technical quality, interpersonal manner, communication, financial aspects, time spent with physician and accessibility and convenience). The wording of the items is either positive or negative. The instrument requires about 3-5minutes to complete. This questionnaire was carved out of the PSQ long form which is an 80 item questionnaire. The scale has a reported reliability coefficient of .90 for all scales except the interpersonal and communication subscale which fall below .70. However, the subscales of both the PSQ and the PSQ short form are substantially correlated.

Patient- Doctor relationship questionnaire PDRQ-9 (Van der Feltz-Cornelis, Van Oppen, Van Marwijk, De Beurs & Van Dyck, 2004).

This instrument was developed to assess patients' perception of helping attitudes of health care professional. This was developed from the helping Alliance questionnaire of Luborsky, a scale that measures the therapeutic alliance in psychotherapy. PDRQ-9 is a 9 item questionnaire which requires about 2-3minutes to complete. It is a 5-point Likert scale with response sets (not at all approapraite =1, somewhat appropriate=2, appropriate=3, mostly appropriate 4, totally appraprait= 5). The scale has a croncbach coefficient alpha of .94 delineating good internal consistency of the scale (Van der Feltz-Cornelis, Van Oppen, Van Marwijk, De Beurs & Van Dyck, 2004)

Morisky 8-Item Medication Adherence Questionnaire (Morisky, Green and Levine, 1986)

This self-report scale consists of 8 items answered with a Yes or No scale. The score range for this scale is from No (0) to Yes (1). A total score of >2, 1 - 2, and 0 means low adherence, medium adherence and high adherence

respectively. This scale's reliability analysis revealed an overall Cronbach's alpha of .753. (Plakas et al., 2016).

Ethical Considerations

Since the study involved human participants, ethical clearance was sought from the Ethical Review Board of the University of Cape Coast. A copy of the study proposal was sent to the Ethical Review Board to be reviewed to ensure all procedures ensure the safety of participants and approved before the study commences.

Pre-test of Instrument

A pre-test study was conducted prior to the main study to determine the reliability of the scales employed in the study. This pre-test was done by administering the data collection questionnaire to 15 HIV patients receiving out-patient care at the Cape Coast Municipal Hospital based on the availability and willingness of patients to participate in the study. The reliability scores for Patient- Doctor Relationship questionnaire PDRQ-9, Patient satisfaction questionnaire PSQ short form, Multidimensional scale of perceived social support and Morisky 8-Item Medication Adherence Questionnaire were .944, .607, 0.889 and .703 respectively (see appendix H).

Data Collection Procedure

On the 21th of June, 2018, an introductory letter and ethical clearance from the Department of Education and Psychology and College of Education Ethical Review Board respectively, University of Cape Coast as well as copies of the research proposal and questionnaires were sent to the administrator and medical superintendent at the Asankrangwa Catholic Hospitals for approval to use patients from their facility as participants for the study within a period of

two months. The administrator and medical superintendent on the 26th of June, 2018 introduced the researcher to the health practitioners at the ART centre of the hospital to officially inform them of the researcher's intention to use patients from their centre as participants. An approval was obtained and data gathering was scheduled to begin on the 2nd of July, 2018 after the purpose of the study as well as the questionnaire and ethical considerations had been discussed with the director and health workers at the centre.

Data was gathered on Mondays, Wednesdays and Fridays which were the clinic days for the centre. On each day of the data collection period, the researcher was introduced by the health worker in charge of the centre to the participant. The researcher then discussed the purpose of the study as well as the ethical considerations with the participants. Participants' consent was sought so that the researcher could be assured of their full indulgence and participation. Participants were assured of confidentiality of their information and the fact that the report of the study would be based on group data. The researcher personally administered the questionnaires to the participants in a room created for the purpose of the data collection at the centre in order to ensure less distraction and enhance privacy and also ascertain a higher response rate. Participants were allowed to seek any clarification they required so as to ensure appropriate responses. Instructions regarding how the items were to be responded to were clearly stated on the questionnaire. These instructions were also explained to the participants so as to ensure that participants had appreciated what was required of them as regards how they were to indicate their response choices. Participants who required any form of assistance pertaining to how to respond or difficulty to understand an item

were given as much insight into the questions as possible without hinting a response. However, since 42.6% and 43.6% of the participants had no formal education and basic education respectively, participants who required assistance in reading and comprehension of items were assisted by the researcher without hinting a response. The questionnaires were collected as and when participants finished responding to them. It took an average of 15 minutes for a participant who could read and understand and 30 minutes for those assisted by the researcher to complete a questionnaire.

Before the commencement of the main data collection, a pilot study was carried out to ascertain the reliability of the scales to be used in the study. This was done by administering the questionnaires to 15 HIV positive patients receiving care at the Cape Coast Municipal Hospital. The ART centre of the hospital was used for the data collection and it took an average of 15 minutes for a participant who could read and understand and 30 minutes for those assisted by the researcher to complete a questionnaire.

Data Analysis

Demographic data collected was analysed using descriptive statistics, specifically, mean, standard deviation, frequency and percentage. The research questions were also answered using means and standard deviation. All hypotheses were tested using a confidence interval of 95% and an alpha level of .05. Hypothesis one was tested using a standard multiple regression analysis. Mediation analysis was conducted for hypothesis two and four using Hayes Process. For hypothesis three, hierarchical regression was used to analyse the data.

Chapter Summary

The study employed the survey research design for data collection. The target population was 606 of which 234 constituted the sample size. The convenience sampling method was used to obtain the sample size. The data was gathered at the Asankrangwa Catholic Hospital using four standardized questionnaires, namely; Multidimensional scale of perceived social support, Patient satisfaction questionnaire PSQ short form, Patient- Doctor relationship questionnaire PDRQ-9 and Morisky 8-Item Medication Adherence Questionnaire. Four research questions and four hypotheses guided the study. The demographic data and the research questions were analysed descriptive statistics. All hypotheses were tested using a confidence interval of 95% and an alpha level of .05. Hypothesis one was tested using a standard multiple regression analysis. Mediation analysis was conducted for hypothesis two and four using Hayes Process. For hypothesis three, hierarchical regression was used to analyse the data.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The study sought to investigate the relationship between physician-patient relationship, patient satisfaction, social support and HIV/AIDS medication adherence among HIV/AIDS infected adults in the Wasa Amenfi West district in the Western region of Ghana. This chapter consists of the description of the sample characteristics, followed by the analysis of the main data and then the discussion of the result.

Demographic Characteristics of Respondents

The study surveyed the demographic characteristics of the patients who participated in the study. These data comprised gender, age, marital status, and educational level. Out of 234 questionnaires administered, 204 of them were retrieved. Table 1 presents details on the demographic data of the respondents.

Table 1- *Demographic Characteristics of Respondents (n=204)*

Demographic Information	Frequency	Percentage
Gender		
Male	38	18.6
Female	166	81.4
Age range		
18-24 years	12	5.9
25-29 years	21	10.3
30-34 years	23	11.3
35-39 years	28	13.7
40-44 years	31	15.2
45-49 years	32	15.7

50-54 years	26	12.7
55-59 years	17	8.3
60-65 years	14	6.9
Marital Status		
Single	26	12.7
Married	104	51.0
Divorced	40	19.6
Widowed	34	16.7
Educational Level		
No formal education	87	42.6
Basic	89	43.6
Secondary	27	13.2
Tertiary	1	.5

Source: Field survey (2018)

More female (166) patients than male (38) patients participated in the study (Table 1). It appeared that the larger proportion of the respondents were from 30-54 years old (68.6%). As shown in Table 1, 51% of the respondents were married. Few respondents had secondary education (13.2%) and tertiary education (.5%).

Research Questions

This section provided information to address the research questions. Each section presents detailed analysis of the data and the results. All these are geared toward achieving the main purpose of the study.

Research Question One

What is the nature of Physician-Patient relationship at the Asankrangwa Catholic Hospital ART Center?

The study explored the physician-patient relationship at the Asankrangwa Catholic Hospital ART Center. Means and standard deviation were used in interpreting the results from the analysis. Mean scores below 2.5

suggested that there was poor physician-patient relationship whereas mean values above 2.5 indicated that there was good physician-patient relationship. Table 2 provides the details of the analysis.

Table 2- *Physician-Patient Relationship at the Asankrangwa Catholic Hospital ART Center*

Statements	Mean	SD
I trust my Primary Care Practitioner (PCP)	3.36	.48
My PCP is dedicated to help me	3.30	.46
I feel content with my PCP's treatment	3.30	.47
My PCP helps me	3.21	.41
My PCP has enough time for me	3.17	.39
My PCP understands me	3.15	.37
I find my PCP easily accessible	3.08	.30
I can talk to my PCP	3.08	.32
My PCP and I agree on the nature of my medical treatment	3.04	.29
Overall Physician-Patient Relationship	3.19	.26

Source: Field survey (2018)

An overall positive and good physician-patient relationship was found in Asankrangwa Catholic Hospital ART center (M=3.19, SD=.26). The results, as shown in Table 2, indicates that physicians in Asankrangwa Catholic Hospital help patients and had enough time for the patients, and this has built trust and understanding between the patients and the physicians. It was also found that physicians and the patients agreed on the nature of treatment and the patients were aware of their physician's treatment regime and were able to talk to them.

This findings is in line with the view of Engel (1977) who developed the biopsychosocial model of health (BPS), who explained that physicians must not only prescribe a medicinal plan for the patient based on biological etiology and pathogenesis, but also discuss the available interventions with special attention to behaviors and lifestyles that could influence their pain and adherence to the treatment plan. The patient must be involved in formulating and implementing the plan, and maintain a supportive relationship with the physician.

Again, in an attempt to redefine the physician-patient relationship to allow both the physician and patient to take an active role in treatment decision, Emanuel and Emanuel (1992) proposed four models, emphasizing the different understanding of (a) the goals of the physician-patient interaction, (b) the physician's obligations, (c) the role of patient values, and (d) the conception of patient autonomy. These four models are: the paternalistic model; the informative model; the interpretive model; and the deliberative model. Among these models, the finding of this study was in line with the deliberative model which is more relevant in that HIV infection has now become a chronic disease with the introduction of HAART which require a long term physician-patient relationship, as the conception of patient autonomy in this model, according to Emanuel and Emanuel (1992), is moral self-development; the patient is empowered not simply to follow unexamined preferences or examined values, but to consider, through dialogue, alternative health-related values, their worthiness, and their implications for treatment and adherence to treatment. As revealed in the finding of this study, as indicated in Table 2, an overall positive and good physician-patient relationship was found

in Asankrangwa Catholic Hospital ART center where the patients find their physician easily accessible and were able to talk to their PCP It was also revealed that PCP had enough time for the patients help patients and this has built trust and understanding between the patients and the PCP. Again, the patients were aware of their PCP's treatment regime and the patients agreed on the nature of treatment.

Further, the finding of the study was congruent with Charles, Gafni and Whelan (1997) shared decision model, under the medical sociology perspective of the physician-patient relationship. They reasoned that four specific characteristics should be present for shared decision making to be effective. These are: (1) both the physician and the patient are involved, to some extent, in the decision-making process. (2). both parties share information. (3). both take steps to participate in the decision-making process by expressing treatment preferences. (4). both the physician and the patient agree on the treatment option to be adopted. However, the finding was incongruent with a study by Stevenson et al. (2000) who revealed that there is little evidence that both physicians and patients participate in consultation in a way as described in this model.

Research Question Two

What is the level of Patients Satisfaction of their Relationship with Medical Practitioners and the health care system?

The study examined patients' level of satisfaction with their relationship with medical practitioners and the health care system. An 18-item standardised scale was used to measure patients' satisfaction. The composite scores of patients were from 18 to 90. Means and standard deviation was used

in analysing the data gathered. In interpreting the results, mean scores below 54 indicated that patients were dissatisfied whereas mean scores above 54 showed that the patients were satisfied. Based on this cut-off, the respondents were categorised into two groups- satisfied and dissatisfied. Table 3 provides the details.

Table 3-*Patients Level of Satisfaction of their Relationship with Medical Practitioners*

Status	Frequency	Percentage
Dissatisfied	1	.5
Satisfied	203	99.5
Total	204	100.0

Mean=70.57, *SD*=3.54
Source: Field survey (2018)

It was revealed that the majority of the patients (99.5%) who participated in the study were satisfied with the relationship their medical practitioners had with them and the health care system. This was supported by a large mean of 70.57 with a standard deviation of 3.54. Only 1 patient reported dissatisfaction of her relationship with the medical practitioners and the health care system (.5%).

This finding is congruent with Donabedian (1980) who developed the healthcare quality theory which proposes that satisfaction is the principal outcome of the interpersonal process of care and that the expression of satisfaction or dissatisfaction is the patient's judgment on the quality of care in all its aspects, more particularly in relation to the interpersonal component of care. Again, in exploring the connections between human immunodeficiency virus (HIV) positive patients adherence to antiretroviral medication treatment regimens and their beliefs about and satisfaction with their primary care

physicians, Roberts (2002) in an In-depth interview conducted with 28 HIV-positive patients revealed that most patients were extremely satisfied with their current primary care physicians, which is also in line with the finding of this study.

Research Question Three

What are the Social Support Available to HIV/AIDS Patients at Asankrangwa Catholic Hospital?

The study aimed at exploring the social support services available to patients at Asankrangwa Catholic Hospital. A 12-item standardised scale was used to achieve this aim. The social support services were demarcated into three forms: supports from family, those from friends and support from significant others. Means and standard deviation was used to find out which of these categories were the patients receiving support from. Mean scores above 3 showed that patients had support. Table 4 shows the details of the result.

Table 4-*Social Support Available to HIV/AIDS Patients*

Social Supports	Mean	SD
Family	3.78	.57
Significant Others	3.72	.66
Friends	2.78	.80
Overall Support	3.43	.45

Source: Field survey (2018)

The result in Table 4 shows that there were social support services available for HIV/AIDS patients. It was discovered that the patients have the greatest social support from their family. This was followed by support services from significant others which includes support from hospitals and loved ones around them. There was very little support services from friends of

patients who had the condition, which per my observation, could be due to the fact that most patients had not disclose their HIV status to their friends, for fear of stigmatization and discrimination.

The finding of this study is in line with Lazarus & Folkman, (1984) who hypothesized social support as one of a number of antecedent stress resistance resources that contribute to positive adaptational outcomes. And according to Vyavaharkar et al. (2007), an important adaptational outcome for HIV disease is medication adherence, and receiving emotional, informational, and/or tangible support from others in the face of a stressful situation is a major factor mediating such outcomes. Individuals who have access to resources such as social support are more likely to be effective in managing stressful situations and less likely to experience poor outcomes and vice versa (Lazaru & Folkman, 1984). Again, social support has been found to mitigate depressive symptoms of HIV-positive individuals (Hudson, Lee, Miramontes & Portillo (2001).

Research Question Four

What is the Level of Adherence to ART Medication among HIV/AIDS Patients?

The study also explored the level of adherence to ART medication among HIV/AIDS Patients. An 8-item standardised scale from Morisky, Green and Levine (1986) was used to quantify the level of adherence to ART medication of the patients. The score ranges from No = 0 to Yes = 1. Patients who had a total score of more than 2 points on the scale were labelled as low adherence group. Patients who scored 1-2 points were categorised as the

medium adherence group. Respondents who scored 0 points were labelled as high adherence group. Table 5 presents the details of the result.

Table 5- *Level of Adherence to ART Medication among HIV/AIDS Patients*

Groups	Ratings	Frequency	Percentage
Low Adherence	>2	31	15.2
Medium Adherence	1-2	84	41.2
High Adherence	0	89	43.6
Total	--	204	100.0

Mean=1.07, *SD*=1.23

Source: Field survey (2018)

The finding, as shown in Table 5, reveals a moderate to high level of adherence to ART medication among HIV/AIDS patients (*M*=1.07, *SD*=1.23). Greater proportion of the respondents showed high adherence level (43.6%). 41.2% of the respondents reported medium adherence to ART medication. Few respondents reported low level of adherence.

Critical for management of chronic diseases, such as diabetes, heart disease, HIV/AIDS and cancer is adherence to medications. Non-adherence to medicines is a major threat to a successful and quality health care, and is directly related to poor clinical outcomes, high health care costs, and lost productivity. Unlike other chronic diseases such as diabetes and hypertension where drug resistance is not an issue, the management of HIV consists of complex treatment plan with potentially severe side effects and non-adherence leads to drug resistance. Non-adherence to HAART has severe individual, economic and social consequences. It reduces the effectiveness of HAART and leads to drug resistance, which in turn leads to increased morbidity, mortality and further infections of drug resistance viruses. As evident in the

finding of this study, greater proportion of the respondents showed high adherence level (43.6%). About 41.2% of the respondents reported medium adherence to ART medication. Few respondents reported low level of adherence. This could be as a result of the fact that the patients have positive and satisfactory relationship with their physician as well as social support from family and significant others as indicated in Table 2, 3 and 4. For instance, according to Vyavaharkar et al. (2007), an important adaptational outcome for HIV disease is medication adherence, and receiving emotional, informational, and/or tangible support from others in the face of a stressful situation is a major factor mediating such outcomes. Cox, (2002) also found emotional support to be a significant predictor of medication drug adherence among persons with HIV disease. Ironson, Lucette and McIntosh (2015) in their study found that patients who were more involved early in treatment became more adherent to ART after one year. Kerse et al. (2004) also found in their study that only trust and physician-patient concordance were significantly related to compliance. Similarly, Roberts (2002) in her study also found out that good quality physician-patient relationships tended to promote adherence while lesser quality relationships impeded it. For Dang et al. (2013), patient satisfaction has a positive impact on retention in care, which is vital for HIV/AIDS programs, and as suggested by Wouters et al. (2008), patient satisfaction is crucial for a HIV/AIDS program to be successful with a strained health system and to maximise the benefits of scarce resources.

However, though majority of the respondents (43.9 %) self-reported high adherence, this was far below what was revealed in the study of: Aragonés et al. (2011) that saw 70.6% of the participants self-reporting high

adherence; Obirikorang et al.(2013) who found an overall lifetime adherence to be 62.2% while medication adherence in the last six months, last three months, last month, and last week were 73.6%, 87.1%, 91.0%, and 86.0%, respectively and Amankwah (2015), who in her study to find out the facilitators and barriers to antiretroviral therapy adherence among HIV/AIDS patients in a multi-case study of Sunyani regional and municipal hospitals, found a 100% adherence among participants in three days assessment, though 25% did not take medication fully in the seven day's assessment.

Hypotheses Testing

The study was guided by four of hypotheses. These hypotheses were tested using a confidence interval of 95% and an alpha level of .05. For each section the statistical tool used was highlighted together with its' interpretation.

Hypothesis One

H_0: Physician-patient relationship, patients' satisfaction, and social support do not significantly predict adherence to ART medication.

This hypothesis sought to investigate whether patients' satisfaction, physician-patient relationship and social support jointly predict adherence ART medication. A standard multiple regression analysis was employed to test this hypothesis. The predictors were patients' satisfaction, physician-patient relationship, and social support (i.e., family support, friends support, and support from significant others). The level of adherence to ART medication was the criterion. Higher scores on adherence to ART medication indicate low level of adherence whereas lower scores represent high adherence.

The Pearson's product-moment coefficient was first conducted before the regression analysis to test for the linearity assumption. The normal assumption was not violated. The linearity assumption was also met. There was no autocorrelation. This was evident from the test statistics from Durbin-Watson (d) test (d=1.77). There was no multicollinearity. This was found from the tolerance statistics which had values ranging from .815 to 1.227. The Variance Inflation Factor (VIF) statistics also confirmed this with statistics which were lower than 10 (see Appendix F).

Table 6- *Relationship between patients' satisfaction, physician-patient relationship and social support jointly and adherence to ART medication*

		Adherence	Physician-Patient Relationship	Patients Satisfaction	Family	Friends	Significant Others
Adherence	Pearson Correlation	1					
	Sig. (2-tailed)						
Physician-Patient Relationship	Pearson Correlation	.123	1				
	Sig. (2-tailed)	.080					
Patients Satisfaction	Pearson Correlation	-.246*	.073	1			
	Sig. (2-tailed)	.000	.297				
Family	Pearson Correlation	-.106	.044	.234*	1		
	Sig. (2-tailed)	.130	.532	.001			
Friends	Pearson Correlation	.100	.155*	-.055	.169*	1	
	Sig. (2-tailed)	.154	.027	.431	.016		
Significant Others	Pearson Correlation	-.187*	.257*	.260*	.305*	.039	1
	Sig. (2-tailed)	.007	.000	.000	.000	.584	

*. Correlation is significant at the 0.05 level (2-tailed).

The results in Table 6 showed no significant relationship between physician-patient relationship and adherence to ART medication (r=.123, p=.080). This result is incongruent with the study of Schneider, Kaplan, Greenfiel, Wenjun, Wilson, (2004) who found that six of the seven physician-patient relationship quality variables in their study were significantly associated with adherence and that of Roberts (2002) who also found that good quality physician-patient relationships tended to promote adherence while lesser quality relationships impeded it.

Again a significant negative relationship was found between patients' satisfaction and adherence to ART medication (r=-.246, p<.001). This mean as adherence score decreases, patient's satisfaction score increases and vice versa. It is however to be noted, as indicated the adherence scale, that the lower the adherence score, the higher the adherence level and the convers is true. Therefore the finding suggests that more patients are satisfied, the higher they adhere to their medication. This finding is congruent with the work of Levitz (2014) which revealed that patient satisfaction was related to facility retention in HIV care, but it was not related to HIV viral load suppression for those who were currently in care.

Further, the results revealed a significant negative relationship between support from significant others and adherence to ART medication (r=-.187, p=.007). This means as adherence score decreases, social support score increases and vice versa. However, as indicated on the adherence scale, the lower the adherence score, the higher the adherence level and the convers is true. Therefore the finding suggests that the higher the social support, the higher patients adhere to their medication. This finding is also in line with the

study of DiMatteo (2004) who found a significant average r-effect sizes between adherence and practical, emotional, and unidimensional social support; family cohesiveness and conflict; marital status; and living arrangement of adults was established, and that practical support bears the highest correlation with adherence and adherence.

Together, physician-patient relationship (r=.257, p<.001) and patients' satisfaction (r=.260, p<.001) and support from family (r=.305, p<.001) were significantly and positively related to support from significant others. This finding was also congruent with the finding of the study of Kaplan et al. (2004) which found that in multivariable models that accounted for the clustering of patients within physicians' practices, six of the seven physician-patient relationship quality variables were significantly (P < .05) associated with adherence; Roberts (2002) which revealed that most patients were extremely satisfied with their current primary care physicians, and that good quality physician-patient relationships tended to promote adherence while lesser quality relationships impeded it; and that of Ironson et al. (2015) which also showed that patients' involvement in their care as baseline significantly predicted change in percentage of missed doses one year later, such that patients who were more involved early in treatment became more adherent to ART after one year.

The standard multiple regression analysis revealed that the overall model was significant, $F(5, 198)=5.087$, p<.001. That is physician-patient relationship, patient satisfaction and social support jointly predict adherence to HIV medication. This suggests that the predictors (physician-patient relationship, patients' satisfaction, significant others, friends and family)

together explain adherence to ART medication. It was further discovered that 11.4% of the variances in adherence to ART medication was explained by physician-patient relationship, patients' satisfaction, significant others, friends and family. Table 7 presents the details on the contribution of each of the predictors in the model.

Table 7-*Contribution of the Predictors to Criterion (n = 204)*

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.771	1.561		3.057	.003
Physician-Patient Relationship	.073	.030	.172	2.451	.015
Patients Satisfaction	-.059	.020	-.204	-2.888	.004
Family	-.046	.130	-.026	-.353	.724
Friends	.092	.087	.073	1.059	.291
Significant Others	-.265	.113	-.173	-2.337	.020

Criterion: Adherence to ART medication
Source: Field survey (2018)

The results as shown in Table 7 indicates that patients' satisfaction is the greatest contributor of adherence to ART medication, β=-.204, t=-2.888, p=.004. This was followed by physician-patient relationship which was the second highest contributor of adherence to ART medication, β=.172, t=2.451, p=.015. Support from significant others was the third highest predictor of adherence to ART medication, β=-.173, t=-2.337, p=.020. Family (β=-.026, t=-.353, p=.724) and Friends (β=.073, t=1.059, p=.291) did not significantly contribute to adherence to ART medication. This findings suggests that the

predictors (physician-patient relationship, patients' satisfaction, significant others) together explain adherence to ART medication.

The finding was congruent with the study of Dang et al. (2013) which found that patient satisfaction with care influences retention in HIV care and adherence to HAART, which in turn serve as key determinants of HIV suppression; but was incongruent with that of Levitz (2014) that revealed that patient satisfaction was related to facility retention in HIV care, but it was not related to HIV viral load suppression for those who were currently in care.

Again, the standard multiple regression analysis revealed that the overall model was significant, $F(5, 198)=5.087$, $p<.001$ and it was further discovered that 11.4% of the variances in adherence to ART medication was explained by physician-patient relationship, patients' satisfaction, significant others, friends and family with physician-patient relationship being the second highest contributor of adherence to ART medication, $\beta=.172$, $t=2.451$, $p=.015$ as indicated in Table 7. This finding was also congruent with the finding of the study of Kaplan et al. (2004) which found that in multivariable models that accounted for the clustering of patients within physicians' practices, six of the seven physician-patient relationship quality variables were significantly ($P < .05$) associated with adherence; Roberts (2002) which revealed that most patients were extremely satisfied with their current primary care physicians, and that good quality physician-patient relationships tended to promote adherence while lesser quality relationships impeded it; and that of Ironson et al. (2015) which also showed that patients' involvement in their care as baseline significantly predicted change in percentage of missed doses one year

later, such that patients who were more involved early in treatment became more adherent to ART after one year.

Furthermore, as Table 7 indicates, Support from significant others (social support) was the third highest contributor of adherence to ART medication, b=-.173, t=-2.337, p=.020. This finding was congruent with the studies of Vyavaharkar et al. (2007) who revealed that Satisfaction with social support (p = 0.04), and coping focused on managing HIV disease (p = 0.002) were the best positive predictors of medication adherence; DiMatteo (2004) that found 122 studies that correlated structural or functional social support with patient adherence to medical regimens; and that of Cox (2002) who found that having emotional support seemed to predict good compliance.

The results as shown in Table 7 further indicates that patients' satisfaction is the greatest contributor of adherence to ART medication, β=-.204, t=-2.888, p=.004. These findings are congruence with the study of Dang et al (2013) who found that patient satisfaction with care influences retention in HIV care and adherence to HAART, which in turn serve as key determinants of HIV suppression (all p,.0001). However, the study of Levitz (2014) which revealed that patient satisfaction was related to facility retention in HIV care, but it was not related to HIV viral load suppression (of which adherence is a key determinant) for those who were currently in care is incongruent to the findings of this study.

However, support from Family (b=-.026, t=-.353, p=.724) and Friends (b=.073, t=1.059, p=.291) did not significantly contribute to adherence to ART medication. This finding was incongruence with the study of Pichon et al. (2015) which revealed that approximately 43% of those who received

support/reminders from friends/family for medication took all of their doses over a seven day period compared to 57% who did not receive this support.

Hypothesis Two

H_0: Patients' satisfaction significantly mediates the relationship between social support and adherence to ART medication.

This hypothesis sought to examine the mediating role of patients' satisfaction in the relationship between social support and adherence to ART medication. Social support (family, friends, and significant others) was the predictor, patients' satisfaction was the mediator, and adherence to ART medication was the criterion. Mediation analysis was conducted using Hayes Process. Bootstrapping approach was used for the analysis. Specifically, 5000 bootstrap samples for percentile bootstrap confidence interval was used.

The mediation analysis is categorised into three sections. The first section examines the mediation role of patients' satisfaction in the relationship between support from family and adherence to medication. This was followed by analysis on the mediation role of patients' satisfaction between support from friends and adherence to medication. Lastly, the mediating role of patients' satisfaction between support from significant others and adherence to medication.

Support from family as predictor (X)

Tables 8 and 9 present results on the medicating role of patients' satisfaction in the relationship between support from family and adherence to ART medication.

Table 8- *Predictions of Support from Family, Patients' Satisfaction and Adherence to ART Medication*

M		*b*-value	*SE*	*t*-value	*p*-value	Model Summary				
						R^2	*F*	df1	df2	*p*
1	Constant	65.06	1.628	39.969	.000*					
	Family Support	1.46	.426	3.423	.001*	.055	11.72	1	202	.001*
2	Constant	2.560	.477	5.363	.000*					
	Family Support	-.190	.125	-1.519	.130	.011	2.31	1	202	.130
3	Constant	6.934	1.390	4.987	.000*					
						.063	6.786	2	201	.001*
	Family Support	-.092	.126	-.732	.465					
	Patient Satisfaction	-.067	.020	-3.334	.001*					

Criterion: Model 1-Patients' Satisfaction; Model 2- Adherence; Model 3-Adherence

The results in Table 8 show that support from family significantly predicts patients' satisfaction, b=1.46, t=3.423, p=.001. About 5.5% of the variances in patients' satisfaction is explained by family support. Support from family, however, did not predict adherence to ART medication, b=-.190, t=-1.519, p=.130. Family support and patients' satisfaction together explained 6.3% of the variations in adherence to ART medication, $F(2, 201)=6.786$, p=.001. The contribution of family support was, however, not significant to the model, b=-.092, t=-.732, p=.465.

Further analysis was presented in Table 9 on the mediation analysis. Information on the total effect, direct effect and indirect effect was provided to explain the medication analysis.

Table 9-*Total Effects, Direct Effect and Indirect Effect*

	Effect	SE	t-value	p-value	Confidence Interval	
					Lower Limit	Upper Limit
Total effect of X on Y	-.189	.125	-1.52	.130	-.437	.057
Direct effect of X on Y	-.092	.126	-.732	.465	-.339	.156
Indirect effect of X on Y	Effect	Boot SE	BootLLCI		Boot ULCI	
Patients' Satisfaction (M)	-.098	.051	-.214		-.014	

X-Family Support; Y-Adherence to Medication

A nonsignificant direct effect (*b*=-.092, *t*=-.732, *p*=.465) and total effect (*b*=-.189, *t*=-1.52, *p*=.130) of family support on adherence to ART medication was found. The indirect effect of family support on adherence to ART medication was found to be significant. Patients' satisfaction was found as a significant mediator in the relationship between family support and adherence to ART medication, b=-.098, BootCI [-.214 to -.014]. The results from the total effect and direct effect confirms to the fact that patients' satisfaction play a full mediation role in support from family and adherence to medication. This suggests that support from family completely depends on patients' satisfaction to affect adherence to ART medication.

This finding is congruence with Vyavaharkar et al. (2007) who revealed in their study that Satisfaction with social support (p = 0.04) was one of the best positive predictors medication adherence.

Support from friends as predictor (X)

Table 10 and 11 presents results on the medicating role of patients' satisfaction in the relationship between support from friend and adherence to ART medication.

Table 10- *Predictions of Support from Friends, Patients' Satisfaction and Adherence to ART Medication*

M		*b*-value	*SE*	*t*-value	*p*-value	R^2	Model Summary *F*	df1	df2	*p*
1	Constant	71.25	.895	79.577	.000*					
	Friends Support	-.244	.309	-.789	.431	.003	.622	1	202	.431
2	Constant	1.491	.256	5.830	.000*					
	Friends Support	.126	.088	1.4309	.154	.010	2.05	1	202	.154
3	Constant	6.429	1.415	4.543	.000*					
	Friends Support	.109	.086	1.273	.205	.068	7.363	2	201	.001*
	Patient Satisfaction	-.069	.0196	-3.544	.001*					

Criterion: Model 1-Patients' Satisfaction; Model 2- Adherence; Model 3-Adherence

As shown in Table 10, support from fiends was not a significant predictor of patients' satisfaction [$F(1, 202)=.622$, $p=.431$, $R^2=.003$]. Again, support from friends also did not predict adherence to ART medication [$F(1, 202)=.2.05$, $p=.154$, $R^2=.010$]. A significant joint effect of support from friends and patients satisfaction on adherence to ART medication, $F(2, 201)=7.363$, $p=.001$ was established. The predictor and the mediator were found to contribute to 6.8% of the variations in adherence to ART medication. Table 11 further highlights on the mediation analysis. Information on the total effect, direct effect and indirect effect was provided to explain the medication analysis.

Table 11-*Total Effects, Direct Effect and Indirect Effect*

	Effect	SE	t-value	p-value	Confidence Interval	
					Lower Limit	Upper Limit
Total effect of X on Y	.088	.088	1.431	.154	-.048	.300
Direct effect of X on Y	-.535	.086	1.273	.205	-.060	.279
Indirect effect of X on Y	Effect	Boot SE	BootLLCI		Boot ULCI	
Patients' Satisfaction (M)	.169	.022	-.027		.279	

X-Friends Support; Y-Adherence to Medication

The results in Table 11 found a nonsignificant total effect of support from friends on adherence to ART medication, *b*=.088, *t*=1.431, *p*=.154. The direct effect of friend support on adherence to ART medication was not significant, b=-.535, *t*=1.273, *p*=.205. The indirect effect of friends support on adherence to ART medication was not significant, *b*=.169, *BootCI* [-.027-.279]. This showed that patients' satisfaction does not significantly mediates the relationship between support from friends and adherence to medication. The result suggests that patients' satisfaction does not play a role in support from friends and adherence to medication.

This finding was incongruent with the study of Pichon et al. (2015) in which it was found that approximately 43% (n = 74) of those who received support/reminders from friends/family for medication took all of their doses over a seven day period compared to 57% (n = 97) who did not receive this support ($\chi 2$ = 4.597, p-value = 0.032) and that of Vyavaharkar et al. (2007) who also revealed in their study that Satisfaction with social support (p = 0.04) was one of the best positive predictors medication adherence.

Support from significant others as predictor (X)

Tables 12 and 13 present results on the medicating role of patients' satisfaction in the relationship between support from significant others and adherence to ART medication.

Table 12-*Predictions of Support from Significant Others, Patients' Satisfaction and Adherence to ART Medication*

M		*b*-value	*SE*	*t*-value	*p*-value	Model Summary				
						R^2	*F*	df1	df2	*p*
1	Constant	65.416	1.369	47.775	.000*	.068	14.636	1	202	.000*
	Significant Others	1.385	.362	3.826	.000*					
2	Constant	2.907	.399	7.277	.000*					
	Significant Others	-.286	.106	-2.705	.007*	.035	7.277	1	202	.007*
3	Constant	6.888	1.373	5.015	.000*					
	Significant Others	-.201	.107	-1.878	.062	.077	8.378	2	201	.003*
	Patient Satisfaction	-.061	.020	-3.024	.003*					

Criterion: Model 1-Patients' Satisfaction; Model 2- Adherence; Model 3-Adherence

The findings showed that support from significant others significantly predicts patients satisfaction, b=1.385, t=3.826, p<.001. Support from significant others was found to explain 6.8% of the variances in patients satisfaction [F(1, 202)=.14.636, p<.001, R^2=.068]. Support from significant others was found as a significant predictor of adherence to ART medication, b=-.286, t=-2.705, p=.007, such that support from significant others explains 3.5% of the variances in adherence to ART medication. When controlling for patients' satisfaction, support from significant others was not found as a

significant contributor to adherence to ART medication, *b*=-.201, *t*=-1.878, *p*=.062. However, the predictor and the mediator jointly predict adherence to ART medication, *F*(2, 201)=8.378, *p*=.003.

Further analysis was presented in Table 13 on the mediation analysis. Information on the total effect, direct effect and indirect effect was provided to explain the medication analysis.

Table 13-*Total Effects, Direct Effect and Indirect Effect*

	Effect	SE	t-value	p-value	Confidence Interval	
					Lower Limit	Upper Limit
Total effect of X on Y	-.286	.106	-2.70	.007*	-.494	-.078
Direct effect of X on Y	-.201	.107	-1.88	.205	-.413	.010
Indirect effect of X on Y	Effect	Boot SE	BootLLCI		Boot ULCI	
Patients' Satisfaction (M)	-.084	.046	-.186		-.011	

X-Support from Significant Others; Y-Adherence to Medication

The results, in Table 13, revealed a significant total effect of support from significant others on adherence to medication, *b*=-.286, *t*=-2.70, *p*=.007. The direct effect of support from significant others on adherence to ART medication was not significant, *b*=-.201, *t*=-1.88, *p*=.205. The indirect effect of support from significant others on adherence to ART medication was found significant, *b*=-.084, *BootCI* [-.186 to -.011]. This indicates a significant partial mediation of patients' satisfaction in the relationship between support from significant others and adherence to ART medication.

The finding of study was congruence of the findings of the studies of: DiMatteo (2004) who found 122 studies that correlated structural or functional social support with patient adherence to medical regimens; that of Cox (2002) who found that having emotional support seemed to predict good compliance;

and that of Vyavaharkar et al. (2007) who revealed that Satisfaction with social support (p = 0.04), and coping focused on managing HIV disease (p = 0.002) were the best positive predictors medication adherence.

Hypothesis Three

H_0: There is no significant association between demographic variables, and adherence among HIV patients

This hypothesis sought to examine the relationship between demographic characteristics of respondents (gender, marital status, and educational level), and adherence among HIV patients. Hierarchical multiple regression was used to analyse the data. The demographic variables were dummy coded and used as predictors and the criterion was adherence to ART medication. Analysis in Table 14 presents the summary of results.

The normal assumption was not violated. The linearity assumption was also met. There was no autocorrelation. This was evident from the test statistics from Durbin-Watson (d) test (d=1.51). There was no multicollinearity. This was found from the tolerance statistics which had values ranging from .390 to 994. The Variance Inflation Factor (VIF) statistics also confirmed this with statistics which were lower than 10 (see Appendix G).

A significant negative relationship was revealed between educational level of respondents and level of adherence to ART medication (r=-.219, p=.003). Gender (r=-.087, p=.218) and marital status (r=-.075, p=.285) had no significant relationship with adherence to ART medication.

Table 14-*Relationship between Demographic Characteristics and Adherence to ART Medication*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Change Statistics				Overall Model	
		B	Std. Error	Beta			R^2	R^2 Change	F change	Sig	F	Sig.
1	(Constant)	1.632	.108		15.180	.000						
	Basic	.345	.151	.169	2.284	.023	.037	.037	2.596	.054	2.596	.054
	Secondary	.405	.221	.136	1.832	.068						
	Tertiary	1.368	1.009	.094	1.356	.177						
2	(Constant)	1.591	.233		6.818	.000						
	Basic	.321	.155	.158	2.076	.039						
	Secondary	.401	.227	.134	1.772	.078						
	Tertiary	1.331	1.011	.092	1.316	.190	.051	.013	.931	.427	1.774	.109
	Married	.078	.225	.038	.345	.731						
	Divorced	.210	.257	.082	.817	.415						
	Widowed	-.172	.270	-.063	-.637	.525						
3	(Constant)	1.682	.294		5.713	.000						
	Basic	.315	.156	.155	2.027	.044						
	Secondary	.382	.230	.128	1.659	.099						
	Tertiary	1.254	1.025	.087	1.224	.222	.052	.001	.260	.610	1.542	.155
	Married	.063	.227	.031	.279	.780						
	Divorced	.206	.258	.081	.800	.425						
	Widowed	-.162	.271	-.060	-.597	.551						
	Female	-.098	.191	-.038	-.510	.610						

1. Predictors: (Constant), Tertiary, Secondary, Basic
2. Predictors: (Constant), Tertiary, Secondary, Basic, Married, Widowed, Divorced
3. Predictors: (Constant), Tertiary, Secondary, Basic, Married, Widowed, Divorced, Female

Criterion: Adherence to ART Medication

The results, as shown in Table 14, revealed that none of the demographic characteristics (i.e., gender, marital status, and educational level) significantly predicts adherence to ART medication. Again, all the three models were not significant indicating that the joint prediction of gender, marital status, and educational level to adherence to ART medication was not significant. The data gathered provided little evidence of significant relationship of adherence to ART medication with gender, marital status, and educational level.

This finding is congruence with Aragonés et al. (2011), who in their study to measure levels of treatment adherence and its predictive factors in persons with HIV/AIDS receiving antiretroviral therapy, using a cross-sectional study with Cuban HIV-positive individuals receiving antiretroviral therapy in 2006, found no significant differences between highly adherent and less adherent patients with regard to sex, place of residence, treatment setting, time of diagnosis, or length of treatment.

Hypothesis Four

H_0: Patients' satisfaction significantly mediates the relationship between physician-patient relationship and adherence to ART medication.

This hypothesis sought to examine the mediating role of patients' satisfaction in the relationship between physician-patient relationship and adherence to ART medication. Physician-patient relationship was the predictor, patients' satisfaction was the mediator, and adherence to ART medication was the criterion. Mediation analysis was conducted using Hayes Process. Bootstrapping approach was used for the analysis. Specifically, 5000

bootstrap samples for percentile bootstrap confidence interval was used. Details of the results are shown in Table 15 and 16.

Table 15-*Predictions of Physician-Patient Relationship, Patients' Satisfaction and Adherence to ART Medication*

M		*b*-value	*SE*	*t*-value	*p*-value	Model Summary				
						R^2	*F*	df1	df2	*p*
1	Constant	67.45	2.99	22.484	.000*					
	Physician-Patient Relationship	.109	.104	1.045	.297	.054	1.092	1	202	.297
2	Constant	.343	.856	.401	.689					
	Physician-Patient Relationship	.052	.030	1.758	.080	.015	3.092	1	202	.080
3	Constant	5.311	1.55	3.423	.007*					
	Physician-Patient Relationship	.060	.029	2.089	.038	.080	8.822	2	201	.002*
	Patient Satisfaction	-.074	.019	-3.788	.002*					

Criterion: Model 1-Patients' Satisfaction; Model 2- Adherence; Model 3-Adherence

The results in Table 15 shows that Physician-Patient Relationship do not significantly predict patients' satisfaction, b=.109, t=1.045, p=.297. Physician-Patient Relationship also did not predict adherence to ART medication, b=-.052, t=-1.758, p=.080. Physician-Patient Relationship and patients' satisfaction together explained 8.0% of the variations in adherence to ART medication, $F(2, 201)$=8.822, p=.002. The contribution of Physician-

Patient Relationship, *b*=.060, t=2.089, *p*=.038 and patients' satisfaction, *b*=-.074, t=-3.788, *p*=.002 was significant to the model.

Further analysis was presented in Table 16 on the mediation analysis. Information on the total effect, direct effect and indirect effect was provided to explain the medication analysis.

Table 16-*Total Effects, Direct Effect and Indirect Effect*

	Effect	SE	t-value	p-value	Confidence Interval	
					Lower Limit	Upper Limit
Total effect of X on Y	.052	.030	1.758	.080	-.006	.0111
Direct effect of X on Y	.060	.029	2.089	.038*	.003	.117
Indirect effect of X on Y	Effect	Boot SE	BootLLCI		Boot ULCI	
Patients' Satisfaction (M)	-.008	.013	-.038		.012	

X-Physician-Patient Relationship; Y-Adherence to Medication

A nonsignificant total effect (*b*=.052, *t*=1.758, *p*=.080) of physician-patient relationship on adherence to ART medication was found. The study revealed a significant direct effect, *b*=.060, t=2.080, *p*=.038 of physician-patient relationship on adherence to ART medication. The indirect effect of physician-patient relationship on adherence to ART medication was found to be nonsignificant, *b*=-.008, BootCI [-.038 to .012]. This suggests that patients' satisfaction do not significantly mediate the relationship between physician-patient relationship and adherence to ART medication.

This finding is incongruence with the study of Roberts (2002) which revealed that most patients were extremely satisfied with their current primary care physicians, and that good quality physician-patient relationships tended to promote adherence while lesser quality relationships impeded it. Again, the nonsignificant direct effect (β=.052, t=1.758, p=.080) of physician-patient

relationship on adherence to ART medication which was found in the study is incongruence of the finding of the study of Kaplan et al. (2004) which found that in a multivariable models that accounted for the clustering of patients within physicians' practices, six of the seven physician-patient relationship quality variables were significantly associated with adherence; and that of Ironson et al. (2015) which also showed that patients' involvement in their care as baseline significantly predicted change in percentage of missed doses one year later, such that patients who were more involved early in treatment became more adherent to ART after one year.

Chapter Summary

In sum, an overall positive and good physician-patient relationship was found in Asankrangwa Catholic Hospital ART center and patients were satisfied with the relationship they had with their practitioners and the health care system. Social services available to the HIV patients were from the family and significant others but no support was reported as coming from friends, and the study revealed a moderate to high level of adherence among HIV patients. Support from significant others was found as a significant predictor of adherence to ART medication whilst support from family and friends were found as nonsignificant predictors of ART medication. Patients' satisfaction was also found as a significant predictor of adherence to ART medication. Contrary to literature, it was revealed that physician-patient relationship did not predict adherence to medication. Together, social support, patients' satisfaction, and physician-patient relationship significantly predicted adherence to medication. Patients' satisfaction mediated between support from family and adherence to ART medication, as well as support from significant

others and adherence to ART medication. However, it did not mediate between support from friends and adherence to ART medication as well as physician-patient relationship and adherence to medication. Gender, marital status and educational level were not found to be associated with adherence to medication.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter deals with the summary, conclusions and recommendations in relation to the findings of the study.

Summary

The study was conducted primarily to find out the relationship between physician-patient relationship, patient satisfaction, social support and antiretroviral medication adherence among HIV positive adults at the Asankrangwa Catholic Hospital in the Amenfi West District in the Western Region of Ghana. A quantitative approach, specifically descriptive survey design was used and the convenience sampling technique was used to select 234 participants for the study. Four research questions and four hypotheses guided the study. Questionnaires were used to gather data from the participants. Demographic data collected was analysed using descriptive statistics, specifically, mean, standard deviation, frequency and percentage. The research questions were also answered using means and standard deviation. All hypotheses were tested using a confidence interval of 95% and an alpha level of .05. Hypothesis one was tested using a standard multiple regression analysis. Mediation analysis was conducted for hypothesis two and four using Hayes Process. For hypothesis three, hierarchical regression was used to analyse the data. .

Key findings

Key findings of this study were as follows:

1. An excellent physician-patient relationship was found at the Asankrangwa Catholic Hospital ART Centre.
2. HIV patients were satisfied with the relationship they had with their practitioners and the health care system.
3. Social services available to the HIV patients were from the family and significant others. No support was reported as coming from friends.
4. The study revealed a high level of adherence among HIV patients.
5. Physician-patient relationship, patients' satisfaction and social support together significantly predicted adherence to medication.
6. Patients' satisfaction was found as a significant mediator in the relationship between social support and adherence to ART medication. Specifically, patients' satisfaction mediated between support from family and adherence to ART medication, as well as support from significant others and adherence to ART medication. Patients' satisfaction, however, did not mediate between support from friends and adherence to ART medication.
7. Gender, marital status and educational level were not found to be associated with adherence to medication.
8. Patient satisfaction is not a significant mediator of physician-patient relationship and adherence to medication.

Conclusions

The main findings of the study confirm that there was a good physician-patient relationship at the ART centre, and patients were satisfied with the relationship they have with their physician as well as the health care system. Social services available to the HIV patients were from the family and significant others. The study also confirmed a high level of adherence among HIV patients. Physician-patient relationship, patients' satisfaction and social support together were seen as a significantly predictor of adherence to medication. Therefore, there is the need to promote good physician-patients relationship as well as patient satisfaction at ART centre. Also, HIV positive patients need social support, especially from the family and significant others in order to adhere to their medications. Adequate measures must be put in place at the health care centres to increase satisfaction among patients as it predicts adherence to ART medications as well as play a mediating role between social support (support from family and significant others) and adherence to ART medications.

Recommendations

Base on the findings and conclusions of the study, it is recommended that:

1. The Ministry of Health, Ghana Health Service, Hospital management and Health care practitioners put adequate measures in place to increase satisfaction among patients as it predicts adherence to ART medications as well as play a mediating role between social support (support from family and significant others) and adherence to ART medications.

2. There should be public education by stakeholders in the HIV care management on the need to provide social support to HIV positive individuals.

Suggestions for further research

This study was limited to only HIV patients at the Asankrangwa Catholic Hospital ART centre in the Amenfi West District in the Western Region of Ghana. In light of this, it is recommended that:

1. Further studies adopt a mixed method or qualitative approach in order to gather in-depth knowledge about these variables for better understanding.
2. Further studies adopt other methods of measuring adherence such as pill count and biological markers like CD4 count or viral load to validate the self-reported adherence.

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APPENDICES

APPENDIX A

RESEARCH QUESTIONNAIRE

This questionnaire is part of a study on Physician-Patient Relationship, Patient Satisfaction, Social Support, and Antiretroviral medication adherence among HIV infected adults. The results of this research, based on your responses will be presented to the School of Graduate Studies, University of Cape Coast. Please be assured that this exercise is mainly for academic purpose and your anonymity any information provided will be treated as confidential. Thank you for your assistance.

Directions: Please respond by ticking [√].

SECTION A: DEMOGRAPHIC DATA

1. Gender: [ ] Male [ ] Female

2. Age: [ ] 18-24 [ ] 25-29 [ ] 30-34 [ ] 35-39 [ ] 40-44 [ ] 45-49

[ ] 55-59 [ ] 60-65

3. Marital status: [ ] Single [ ] Married [ ] Divorced [ ] Widowed

4. Educational level: [ ] No formal education [ ] Basic [ ] Secondary [ ] Tertiary

SECTION B: ADHERENCE TO MEDICATION

Please respond to the following statements on adherence to medication base on your personal experience. There is no right or wrong answer.

	QUESTIONS	YES	NO
5	Do you sometimes forget to take your medications?		
6	Thinking over the past two weeks, did you sometimes miss taking your medications for reasons other than forgetting?		
7	Have you ever stop taking your medications without telling your doctor, because you felt worse when you took it?		
8	Do you sometimes forget to take along your medication when you travel or leave home?		
9	Did you take your medication yesterday?		
10	Do you sometimes stop taking your medications when you feel like your health condition is under control?		
11	Do you ever feel stressed about taking your medication every day and sticking to your treatment plan?		
12	Do you often have difficulty remembering to take your medication		

SECTION C: PHYSICIAN-PATIENT RELATIONSHIP

Please respond to the following statements on Primary Care Practitioner (PCP) by using **Strongly Disagree (SD), Disagree (D), Agree (A),** and **Strongly Agree (SA).** Please tick [√] one per statement

	STATEMENTS	**SD**	**D**	**A**	**SA**
13	My PCP helps me				
14	My PCP has enough time for me				
15	I trust my PCP				
16	My PCP understands me				
17	My PCP is dedicated to help me				
18	My PCP and I agree on the nature of my medical symptoms				
19	I can talk to my PCP				
20	I feel content with my PCP's treatment				
21	I find my PCP easily accessible				

SECTION D: PATIENT SATISFACTION

Please indicate how strongly you AGREE or DISAGREE with each of the following statement about your medical care. Kindly tick [√] **Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD)** where appropriate.

	STATEMENTS	**SA 1**	**A 2**	**N 3**	**D 4**	**SD 5**
22	Doctors are good about explaining the reason for medical tests					
23	My doctor's office has everything needed to provide complete medical care					
24	The medical care I have been receiving is just about perfect					
25	Sometimes doctors make me wonder if their diagnosis is correct					
26	I feel confident that get the medical care I need without being set back financially					
27	My medical practitioners are careful to check everything when examining and treating me					
28	I have to pay more of my medical care than I can afford					
29	I have easy access to the medical specialist whenever I need it					
30	People have to wait too long for emergency treatment at the medical center					

31	Doctors are too businesslike and impersonal towards me					
32	My doctors treat me in a very friendly and courteous manner					
33	Those who provide my medical care sometimes hurry too when they treat me					
34	Doctors sometimes ignore what I tell them					
35	I have doubts about the ability of the doctors who treat me					
36	Doctors usually spend more time with me					
37	I find it hard to get an appointment for medical care whenever I need it					
38	I am dissatisfied with some things about the medical care I receive					
39	I am able to get medical attention whenever I need it					

SECTION E: SOCIAL SUPPORT

Please indicate how you feel about the following statements on social support by ticking [√] **Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), Strongly Agree (SA).**

	STATEMENTS	**SD**	**D**	**N**	**A**	**SA**
40	There is a special person who is around when I am in need					
41	There is a special person with whom I can share my joys and sorrows					
42	My family really tries to help me emotionally					
43	I get the emotional help and support I need from my family					
44	I have a special person who is a real source of comfort to me					
45	My friends really try to help me emotionally					
46	I can count on my friends when things go wrongly					
47	I can talk to my family about my problems					
48	I have friends with whom I can share my joys and sorrows					
49	There is a special person in my life who cares about my feelings					
50	My family is willing to help me make decisions					
51	I am able to talk about my problems with my friends					

APPENDIX B

INTRODUCTORY LETTER

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
FACULTY OF EDUCATIONAL FOUNDATIONS
DEPARTMENT OF EDUCATION AND PSYCHOLOGY

Telephone: 233-3321-32440/4 & 32480/3
Direct: 033 20 91697
Fax: 03321-30184
Telex: 2552, UCC, GH.
Telegram & Cables: University, Cape Coast
Email: edufound@ucc.edu.gh

UNIVERSITY POST OFFICE
CAPE COAST, GHANA

Our Ref:

Your Ref:

20th June, 2018

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

LETTER OF INTRODUCTION
MS. JUDITH USSHER

We introduce to you Mr. Judith Ussher, an M.Phil Clinical Health Psychology student from the Department of Education and Psychology University of Cape Coast.

As part of the programme requirement, she is undertaking a research entitled "Physician-Patient Relationship, Patient Satisfaction, Social support and Antiretroviral medication adherence among HIV/AIDS Infected Adult".

This is purely for academic purpose. All information gathered would be treated confidentially.

We would be grateful if she is given all the needed assistance toward this necessary academic exercise.

Thank you.

Yours faithfully,

Georgina Nyantakyiwaa Thompson **(Ms.)**
Principal Administrative Assistant
For: HEAD

APPENDIX C

ETHICAL CLEARANCE

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
ETHICAL REVIEW BOARD
UNIVERSITY POST OFFICE
CAPE COAST, GHANA

Our Ref: CES-ERB/ucc.edu/18-6
Your Ref: .....
Date: 12.04.2018

Dear Sir/Madam,

ETHICAL REQUIREMENTS CLEARANCE FOR RESEARCH STUDY

Chairman, CES-ERB
Prof. J. A. Omotosho
jomotosho@ucc.edu.gh
0243784739

Vice-Chairman, CES-ERB
Prof. K. Edjah
kedjah@ucc.edu.gh
0244742357

Secretary, CES-ERB
Prof. Linda Dzama Forde
lforde@ucc.edu.gh
0244786680

The bearer, Judith Ussher, Reg. No. ED/CHP/16/0007 is an M.Phil. / Ph.D. student in the Department of Education and Psychology in the College of Education Studies, University of Cape Coast, Cape Coast, Ghana. He / She wishes to undertake a research study on the topic:

Physician-patient relationship, patient satisfaction social support and anti-retroviral medication adherence among HIV infected adults in the Western Region of Ghana.

The Ethical Review Board (ERB) of the College of Education Studies (CES) has assessed his/her proposal and confirm that the proposal satisfies the College's ethical requirements for the conduct of the study.

In view of the above, the researcher has been cleared and given approval to commence his/her study. The ERB would be grateful if you would give him/her the necessary assistance to facilitate the conduct of the said research.

Thank you.
Yours faithfully,

Prof. Linda Dzama Forde
(Secretary, CES-ERB)

APPENDIX D

INFORMATION SHEET FOR PARTICIPANTS

Participant Information Leaflet

Title: Physician-Patient Relationship, Patient Satisfaction, Social Support, and Antiretroviral Medication Adherence among HIV infected adults.

Principal Investigator: Judith Ussher

Supervisor: Prof. Koawo Edjah and Dr. Kofi Krafona

Address: Department of Education and psychology, College of Education Studies.

General Information about Research

This study is purposely aimed at examining the relationships between physician-patient relationship, patient satisfaction, social support, and antiretroviral medication adherence among HIV infected adult receiving treatment at the Aankrangwa Catholic Hospital in the Western Region and St. Luke's Catholic Hospital (Apam) in the Central Region. The instruments to be used to collect data for the research are: Patient- Doctor relationship questionnaire PDRQ-9 (Van der Feltz-Cornelis, Van Oppen, Van Marwijk, De Beurs and Van Dyck, 2004); Patient satisfaction questionnaire PSQ short form (Marshal Hays, 1993); Multidimensional scale of perceived social support (Zimet, Dahlem, Zimet & Farley, 1988); and Morisky 8-Item Medication Adherence Questionnaire (Morisky, Green and Levine,1986). It will take about 10-25 minutes to answer the questionnaire completely.

Procedures

To help me understand more about facilitators and barriers to antiretroviral medication adherence, I humbly invite you to take part in this research work. If you accept, you will be required to complete the questionnaire which will be supervised by Ms. Judith Ussher. You may answer the questionnaire yourself or it can be read to you for you to choose the answer that best suits your situation. Participating in this study will go a long way to help health professionals understand and develop a better intervention strategy aimed at improving your adherence to treatment medications. Since this exercise is mainly for academic purpose, your anonymity and confidentiality is strictly assured. No one else except the principal investigator and the two thesis supervisors will have access to your responses.

Possible Risks and Discomforts

Though I do not wish this to happen, there is the risk that you may share some personal or confidential information by chance or that you may feel uncomfortable talking about some topics. You do not have to answer any question or take part in the survey if you feel the questions are too personal or providing them makes you uncomfortable. People sometimes feel nervous when completing a questionnaire, therefore you are free to discontinue the survey when the need arises or in the face of discomforts without any restrictions.

Possible Benefits

Though, there will be no direct benefits to you, your participation is likely to help us understand how physician-patients relationship, patient

satisfaction, and social support influences adherence to antiretroviral medication. Apart from helping me to achieve the aims of the study, other stakeholders such as the Ghana Health Service will benefit from your participation because the results of the study will enable them to make an informed decision tailored towards assisting HIV positive individuals improve adherence to treatment medications.

Alternatives to Participation

The only alternative is not to participate in this study at all.

Confidentiality

Be assured that the information you provide in the questionnaire of the study will be strictly kept privately and protected by law. Your name will appear only on this consent form which together with your questionnaire will be kept in a locked file docket by the principal investigator conducting this study. Your name will not be used in any reports or advertisements. The survey results will be analyzed by the researcher alone and no one will have access to the information provided without your approval.

Compensation

There are no direct incentives for being part of this research project.

Additional Cost

The only cost you would bare in this study is the time you spend in completing the questionnaire which we estimate to be not longer than 10-20 minutes.

Voluntary Participation and Right to Leave the Research

Taking part in this study is voluntary. You may decide not to take part at all, and once you start the study, you may choose to discontinue at any time you feel so. Leaving the study will result in any loss of any interests you would otherwise receive. The Institutional Review Board for Ethical Treatment of Human Subjects of the University of Cape-Coast is the committee that protects the rights of people in research studies. This review board may study records from time to time to ensure that people in research studies are being treated right and that the study is being carried out as planned.

Termination of Participation by the Researcher

If the researcher believes that you are upset or your health condition would be threaten in some way due to your participation and in completing the study survey, the researcher through a dialogue may exempt you from the study.

Contacts for Additional Information

If you have questions about the study right now, you can humbly ask them. You can as well call the principal investigator, Ms. Judith Ussher on 0542024357/0200654986 if you have questions about the study later on.

APPENDIX E

INFORMED CONSENT FORM

Volunteer Agreement

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study and understand that I have the right to withdraw from the [discussion/interview] at any time without in any way affecting my medical care.

…… ……

Signature of volunteer Date

……

Name of volunteer

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks and procedures were read to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

…… ……....

Name of witness Date

……

Signature of witness

Statement of person obtaining informed consent:

I certify that the nature and purpose, the potential benefits, as well as possible risks associated with participating in this research have been explained to the above individual.

…… ……
Signature of Person Who Obtained Consent Date

……
Name of Person Who Obtained Consent

APPENDIX F

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.123[a]	.015	.010	1.00944	1.570

a. Predictors: (Constant), Physician-Patient Relationship

b. Dependent Variable: ADHERENCE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.150	1	3.150	3.092	.080[b]
	Residual	205.830	202	1.019		
	Total	208.980	203			

a. Dependent Variable: ADHERENCE

b. Predictors: (Constant), Physician-Patient Relationship

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.343	.856		.401	.689		
	Physician-Patient Relationship	.052	.030	.123	1.758	.080	1.000	1.000

a. Dependent Variable: ADHERENCE

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.337[a]	.114	.091	.96711	1.773

a. Predictors: (Constant), SIGNIFICANT OTHERS, FRIENDS, Patients Satisfaction, Physician-Patient Relationship, FAMILY

b. Dependent Variable: ADHERENCE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.791	5	4.758	5.087	.000[b]
	Residual	185.189	198	.935		
	Total	208.980	203			

a. Dependent Variable: ADHERENCE

b. Predictors: (Constant), SIGNIFICANT OTHERS, FRIENDS, Patients Satisfaction, Physician-Patient Relationship, FAMILY

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	4.771	1.561		3.057	.003		
	Patients Satisfaction	-.059	.020	-.204	-2.888	.004	.896	1.116
	Physician-Patient Relationship	.073	.030	.172	2.451	.015	.908	1.101
	FAMILY	-.046	.130	-.026	-.353	.724	.849	1.178
	FRIENDS	.092	.087	.073	1.059	.291	.937	1.067
	SIGNIFICANT OTHERS	-.265	.113	-.173	-2.337	.020	.815	1.227

a. Dependent Variable: ADHERENCE

APPENDIX G

Correlations

		Gender	Age	Marital status	Educational level	ADHERENCE
Gender	Pearson Correlation	1	-.118	.184**	-.193**	-.087
	Sig. (2-tailed)		.093	.009	.006	.218
	N	204	204	204	204	204
Age	Pearson Correlation	-.118	1	.516**	-.219**	-.115
	Sig. (2-tailed)	.093		.000	.002	.101
	N	204	204	204	204	204
Marital status	Pearson Correlation	.184**	.516**	1	-.204**	-.075
	Sig. (2-tailed)	.009	.000		.003	.285
	N	204	204	204	204	204
Educational level	Pearson Correlation	-.193**	-.219**	-.204**	1	.178*
	Sig. (2-tailed)	.006	.002	.003		.011
	N	204	204	204	204	204
ADHERENCE	Pearson Correlation	-.087	-.115	-.075	.178*	1
	Sig. (2-tailed)	.218	.101	.285	.011	
	N	204	204	204	204	204

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Model Summary[d]

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.194[a]	.037	.023	1.00287	.037	2.596	3	200	.054	
2	.226[b]	.051	.022	1.00339	.013	.931	3	197	.427	
3	.228[c]	.052	.018	1.00528	.001	.260	1	196	.610	1.514

a. Predictors: (Constant), Tertiary, Secondary, Basic

b. Predictors: (Constant), Tertiary, Secondary, Basic, Married, Widowed, Divorced

c. Predictors: (Constant), Tertiary, Secondary, Basic, Married, Widowed, Divorced, Female

d. Dependent Variable: ADHERENCE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.832	3	2.611	2.596	.054[b]
	Residual	201.148	200	1.006		
	Total	208.980	203			
2	Regression	10.644	6	1.774	1.762	.109[c]
	Residual	198.336	197	1.007		
	Total	208.980	203			
3	Regression	10.907	7	1.558	1.542	.155[d]
	Residual	198.073	196	1.011		
	Total	208.980	203			

a. Dependent Variable: ADHERENCE

b. Predictors: (Constant), Tertiary, Secondary, Basic

c. Predictors: (Constant), Tertiary, Secondary, Basic, Married, Widowed, Divorced

d. Predictors: (Constant), Tertiary, Secondary, Basic, Married, Widowed, Divorced, Female

APPENDIX H

RELIABILITY ESTIMATES

SCALE ONE- PCP

Reliability Statistics

Cronbach's Alpha	N of Items
.944	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
My PCP helps me	26.53	9.552	.902	.931
My PCP has enough time for me	26.60	10.114	.736	.941
I trust my PCP	26.53	9.552	.902	.931
My PCP understands me	26.67	10.524	.641	.945
My PCP is dedicated to help me	26.53	9.981	.749	.940
My PCP and I agree on the nature of my medical symptoms	26.80	11.029	.636	.945
I can talk to my PCP	26.73	10.638	.677	.943
I feel content with my PCP's treatment	26.53	9.552	.902	.931
I find my PCP easily accessible	26.53	9.552	.902	.931

SCALE 2- SATISFACTION

Reliability Statistics

Cronbach's Alpha	N of Items
.607	18

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Doctors are good about explaining the reason for medical tests	63.87	26.267	.695	.579
My doctor's office has everything needed to provide complete medical care	65.00	28.571	-.132	.654
The medical care I have been receiving is just about perfect	64.07	27.067	.188	.599
Sometimes doctors make me wonder if their diagnosis is correct	63.93	25.781	.140	.608
I feel confident that get the medical care I need without being set back financially	63.93	26.638	.170	.599
My medical practitioners are careful to check everything when examining and treating me	64.00	26.571	.222	.594
I have to pay more of my medical care than I can afford	64.13	26.981	.023	.627
I have easy access to the medical specialist whenever I need it	64.60	27.829	-.106	.676

People have to wait too long for emergency treatment at the medical center	64.20	21.029	.623	.512
Doctors are too businesslike and impersonal towards me	63.80	25.886	.223	.593
My doctors treat me in a very friendly and courteous manner	63.93	28.067	-.045	.623
Those who provide my medical care sometimes hurry too when they treat me	63.73	24.067	.644	.547
Doctors sometimes ignore what I tell them	63.87	25.552	.245	.589
I have doubts about the ability of the doctors who treat me	63.60	23.400	.822	.531
Doctors usually spend more time with me	64.13	22.695	.618	.531
I find it hard to get an appointment for medical care whenever I need it	64.20	24.029	.263	.587
I am dissatisfied with some things about the medical care I receive	63.87	26.695	.102	.610
I am able to get medical attention whenever I need it	63.73	25.638	.501	.573

SCALE 3-SOCIAL SUPPORT

Reliability Statistics

Cronbach's Alpha	N of Items
.889	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
There is a special person who is around when I am in need	40.20	80.314	.657	.877
There is a special person with whom I can share my joys and sorrows	40.07	80.924	.633	.879
My family really tries to help me emotionally	39.13	90.267	.627	.879
I get the emotional help and support I need from my family	39.00	91.714	.509	.884
I have a special person who is a real source of comfort to me	40.07	80.924	.633	.879
My friends really try to help me emotionally	39.33	90.952	.791	.875
I can count on my friends when things go wrongly	39.47	92.267	.603	.881
I can talk to my family about my problems	38.93	93.495	.526	.884
I have friends with whom I can share my joys and sorrows	39.47	91.695	.581	.881
There is a special person in my life who cares about my feelings	39.87	82.838	.599	.881
My family is willing to help me make decisions	38.87	91.267	.585	.881

I am able to talk about my problems with my friends	39.33	88.952	.759	.874

Adherence scale

0.47	0.53	0.2491		
0.53	0.47	0.2491		
0	1	0		
0.8	0.2	0.16		
0.73	0.27	0.1971		
0.67	0.33	0.2211		
0.8	0.2	0.16		
0.07	0.93	0.0651		
			1.0764	
				KR20=6/5(1-1.0764/2.600)
				kr20=.7032
				Indicators for the formula
				item difficulty
				Variances of each item
				variances of total scores
				number of items