Facilitators and Barriers to Antiretroviral Therapy Adherence among Ghanaian Patients: A Multi-Case Study of Sunyani Municipal and Regional Hospitals in the Brong-Ahafo Region

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Abstract

The only remedy to manage AIDS remains ART, making adherence to ART paramount in AIDS management. Non-adherence can impede the sustainability of programmes intended at successful HIV and AIDS care. We studied individual, social and service delivery factors influencing adherence to ART. Mixed method involving 133 participants was used, data were analysed using SPSS version 18.0. There were statistically significant relationship between availability of drugs, privacy, relations with health professionals, counselling services, and adherence to ART (($p = 0.008$, $p = 0.001$, $p = 0.008$ and $p = 0.018$ respectively). Although age, gender, and perceived efficacy and need for ART were not significantly related to adherence ($p > 0.05$ in all cases), qualitative findings indicated otherwise. For AIDS patients, ART is tantamount to life, thus, stakeholders should place priority on availability of ARVs and well trained personnel to deliver efficient and quality services to allay the fears of patients.

Introduction

HIV and AIDS have become a health scare in the world since its discovery in the early1980s (UNAIDS & WHO, 2003), with an infection and death rates of 6,800 and 5,700 persons per day, due to insufficient access to treatment and prevention of HIV and AIDS (UNAIDS & WHO, 2007)

HIV has been and is still a challenge in Ghana, thus, in 2011, it was estimated that 225,478 people were living with the disease (NACP, 2011). The number of infected persons receiving treatment was 599,007 as at the end of 2011 (National AIDS Commission, 2013).The occurrence of the disease seems to be on a downward trend, however, the pattern may be described as irregular since prevalence rates have been rising and falling over a period of time. Hence, HIV prevalence dropped from 3.6% in 2003 to 2.7% in 2005, it then increased to 3.2% in 2006 and reduced to 2.2% in 2008. Also, the distribution of the disease is not even across the country. There are variances in the regional distribution of the dominance of the disease. Some parts record high prevalence, principally mining and border towns, while others have lower rates. A major reason for high prevalence in these areas is thought to be the increased commercial activities in those areas, with its attendant attraction of people from all walks of life. A survey conducted in the country revealed that the occurrences of the disease increased in some regions while the Brong Ahafo remained the same (Ghana AIDS Commission, 2012).

Since there is no cure for HIV, adherence to Antiretroviral Therapy (ART) is important to reduce the spread of the virus to enable infected persons live a normal and prolonged life. Highly Active Antiretroviral Therapy (HAART) is currently the most effective regimen for reducing mortality and opportunistic infection among HIV patients. Antiretroviral therapy can be started when

patients including positive pregnant women have a CD4 count below 350 cells/ml (Ministry of Health/Ghana Health Service, 2010). Since the introduction of ART in the management of HIV, it has produced a remarkable results. Reports by the UNAIDS (2012) suggested that since 1999 ART has increased the life expectancy rate of people living with the disease in low and middle income countries. It has been reported that about 8 million people had access to ART by the end of 2011.

Antiretroviral therapy was not part of Ghana's public healthcare system until June 2003, when the health ministry earmarked two places in the Manya Krobo district of the Eastern Region as pilot sites. The treatment included counseling and testing, management of sexually transmitted diseases and prevention of mother to child transmission. It was realized that the therapy had made improvements in the management of the disease at the pilot sites. To ensure a reduction in the spread and mortality caused by the disease, treatment sites were expanded. Since its introduction, the treatment sites as at December, 2009 increased from 2 to about 138, and an estimated number of 337,745 PLHIV were receiving ART (MOH/GHS, 2010). The improvements in access to ART drugs have reduced the occurrence of new infection especially in PMTCT (Ampofo, 2009).

Treatment is by complying with drug combination therapy. For adults, it is recommended that two of nucleoside reverse transcriptase inhibitors (NRTIs) plus a non-nucleoside reverse transcriptase inhibitor be administered as fixed dose combination in the initial stage of treatment. Treatment for the second phase consists of two nucleoside reverse transcriptase inhibitor (NRTIs) plus Ritonavir-boosted protease Inhibitor (PI) administered for adults (WHO 2013).

A lot of factors affect the treatment success of HIV. Among the factors, strict adherence to treatment regimen appears to be crucial. The reason being that a high level of adherence is required for drugs to work effectively, which also ensures the avoidance of the development of drug resistance (Nachega *et al.*, 2006). However, the realization of effective compliance by infected people to the requirements of the treatment regime depends on their ability to accept the treatment recommendation. This has proven to be a big challenge for PLHIV (Mills *et al.*, 2006). Although ART has been proven to be effective, countries which have been able to implement it have all come up against the challenge of patient adherence to treatment programme. Although the drug combination therapy has shown massive improvements in HIV related deaths, non-adherence is thought to account for the treatment failure in most cases (Obirikorang, Selleh, Abledu, & Fofie, 2013). The existence of non-adherence can impede 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, 2006). These factors tend to gain prominence in places with high poverty levels, which generally fits the circumstances of many African countries. Most of the people affected with the disease happen to be in deprived areas where health care accessibility is not optimal. Even though these challenges exist, a lot of resources have been channeled into accelerating access to ART. There is no doubt that accessibility has been improved as reported by UNAIDS in 2012. There are a lot of factors that are yet to be discovered. Ghana for instance have dealt with financial access by subsidizing the cost of ART. People living with HIV have access to free health care. They receive free supply of antiretroviral (ARV) drugs.

Drug adherence depends on both the patients and the relation that exists between providers and patients. Understanding the patient's perspective and reactions after commencing treatment will aid treatment adherence. Studies that applied the objective adherence measure revealed that about 70% of prescribed doses are taken in the treatment of HIV (Horne, Cooper, Gellaitry, Date & Fisher, 2007).

A lot has been done in the area of treatment adherence (Horne *et al.,* 2007; Chesney *et al.,* 2000; Conway, 2007; Mills *et al.,* 2006). Most of these studies were carried out in developed countries and Southern Africa. Though there are studies in Ghana (Obrikorang *et al.,* 2013; Ohene & Forson, 2009) these studies considered only one facility. This research goes beyond what has been done in Ghana by using a multi case study method to identify whether there are differences in adherence to ART in these two facilities. Again these studies considered individual factors. This study adds social and facility support structures as a way of expanding the scope of research on the subject matter.

Again, since the implementation of HAART in Ghana in 2003, studies on HIV have been directed at reducing new infections. Though there are reports on enhanced effect in months into therapy, diminutive data have been published bearing in mind ART adherence and issues concerning treatments (Ohene & Forson, 2009). This has the potential to impact negatively on HIV treatment effectiveness and needs to be urgently addressed. This paper therefore sought to investigate the individual, social, and facility-based factors that influence HIV treatment adherence in the Sunyani Regional and the Municipal hospitals so as to uncover the barriers to adherence and make recommendations to address them as a way forward to improving treatment effectiveness.

Methods

Study Design

In order to ascertain factors that influenced adherence to antiretroviral therapy, multi-case study design was used. This design ensures that two or more cases are studied for in-depth analysis. Multi case study design was deemed appropriate as it permitted inter-facility comparison of adherence to antiretroviral therapy.

The Study Areas

Two study areas were chosen for the study namely, the Sunyani Regional Hospital and the Sunyani Municipal Hospitals because they are designated facilities for HIV management in the Brong-Ahafo Region of Ghana.

Study Population

The study population consisted of all clients diagnosed as HIV positive who attended ART clinic at the Sunyani Regional and Municipal Hospitals, and the health professionals who attended to them were included in the study to ascertain their views on the factors that influenced ART adherence.

Sampling Technique and Sample Size

HIV and AIDS is associated with stigma and discrimination, thus, individuals with the disease usually dissociate themselves from any activity that is likely to expose their HIV positive status. This makes it difficult to sample HIV and AIDS Patients using probability sampling technique, therefore, purposive sampling technique was used to select HIV positive adults 18 years old and above who were willing to be part of the research for the study. One hundred and twenty (120) consisting of 60 participants from each of the two study facilities were involved in the quantitative study whilst 13 others made up of 8 patients and 5 healthcare professionals who had a minimum of one year working experience with HIV treatment were also selected purposively to take part in the qualitative study. The healthcare professionals comprised of the HIV coordinator at the Sunyani Regional Hospital and the HIV counselor at the Municipal Hospital, a representative from the pharmacy department in charge of ART adherence counseling at the Municipal Hospital, a clinician in charge of clinical consultation and a nurse in charge of HAART clinic, both at the Regional Hospital.

Data Collection Methods and Instruments

The study used a mixed method approach utilizing both qualitative and quantitative methods. The quantitative part of the study used self-designed questionnaire administration. The questionnaire was divided into five parts: the first part sought to find out individual characteristics including demography and disease factors; the second part considered social factors such as the existence of support and stigma, culture and religion; the third part focused on service delivery factors including relationship with health professionals, availability of drugs and health promotion activities which had the potential to influence adherence to ART; and the fifth part was on clients' adherence to ART in three and seven days assessment.

The Qualitative aspect took the form of one-on-one in-depth interviews utilizing interview guide through an independent moderator (Harden *et al.*, 2006). The in-depth interviews were held at the study facilities with patients and health workers to gather detailed information on individual, social and facility factors that determine adherence to ART.

Ethical Consideration

Prior to the commencement of the study in 2014, approval was sought from the Ghana Health Service with the study protocol. Following this, permission was granted from the hospital authorities of the study facilities before data collection. Every individual respondent was also approached to give a written or oral consent as per their preference before participation. Before participants were interviewed, each was given a consent form to read and sign. For individuals who could not read, the purpose of the study was explained to them and if they accepted to partake, their thumbprints were taken. throughout the study.

The Research Process

Pre-test of the research tools was carried out to ensure reliability of the data collection instruments. The questionnaire were then revised for data collection. One-on-one interview questionnaire was conducted for each of the 120 participants for the quantitative study, either in English language or

in the local (twi) language as per the choice of the participant. In-depth interviews were also conducted with 8 HIV patients and 5 healthcare professionals.

Data Analysis

The Statistical Package for Social Sciences (SPSS) version 18.0 was used to analyze the quantitative data. Simple statistics and Fisher's Exact Test of independence (data were categorical and nominal) were used to interpret the results. Adherence to ART was analysed in three days and seven days assessment, and participants were grouped into two categories – adherent and non-adherent. The seven days assessment was used to find out the relationship between individual, social and service delivery factors and adherence to ART at 95% confidence interval. The same method was used to assess the differences between the two health facilities.

In-depth interviews were recorded with a digital recorder and transcribed. Data were analysed manually and categorized into themes with the main objectives as a guide. Where necessary, some responses were quoted verbatim whilst others were edited to improve readability. Results of the study were triangulated where relevant.

Results

Demographic characteristics of respondents

The majority (65.8%; 79/120) of respondents were females with 34.2% (41/120) men. Their ages ranged from 18 to 50 years and above. Sixty-five percent of them (78/120) had junior or senior high education, only about 6% (7/120) had tertiary whilst the remaining 29% (35/120) had primary or no formal education. Most of the respondents (about 71%; 85/120) are Christians, 25% (30/120) are Muslim, and the rest are Traditional or other worshippers.

Adherence to ART

All the respondents (100%) adhered to ART treatment in the three days assessment, however, 25% (30/120) were not adherent in the seven days assessment (figure 1). The main reasons for missing medication as presented in Table 1 were forgetfulness and travelling (8.3%; 10/120 and 5.8%; 7/120) respectively. These were consistent with responses from the in-depth interviews as interviewees indicated forgetfulness, travelling and busy schedules as the main causes of missing their medications. Some patient interviewees also indicated that they have been informed that missing just a day dose would not harm them so they sometimes missed dose if medication coincided with social activities.

Figure 1: Adherence to Antiretroviral Therapy

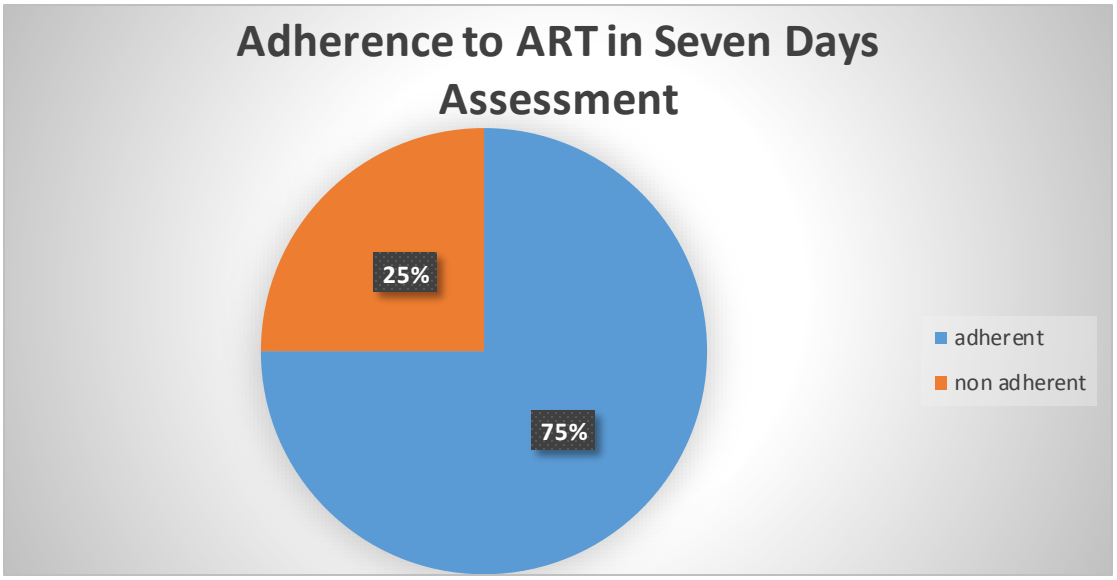

Table 1: Factors Associated with Non-adherence

Risk Factors	frequency	percentage
Forgetfulness	10.0	8.3
Sleeping through a dose	3.0	2.5
Busy schedule	7.0	5.8
Travelling	9.0	7.5
Didn't want people to see me take the drug	1.0	0.8
Not applicable	90.0	75.0
Total	120.0	100.0

Individual factors and adherence to ART

The relationship between adherence to ART and gender, age, and educational level were all not statistically significant ($p = 0.317$; $p = 0.520$; $p = 0.195$ respectively) (Table 2). However, findings from in-depth interviews with health professionals indicated that age and gender have influence on adherence to ART. Four (80%) out of the 5 health professionals interviewed talked about the fact that young men do not usually adhere to HIV treatment. According to them, women regardless of their age are adherent to ART than men, they added that their health records even depict high turn up rate for women than men. Thus,

"Young men find it very difficult accepting their HIV positive status when they find out after testing in the first place. Some will come back and tell you that they don't believe that they have HIV because they feel healthy and strong. Hence, they may agree during counseling to come for treatment but they do not adhere to taking the drugs as scheduled, or will not return for refill" (Health Professional, Sunyani Municipal Hospital)

"If you go through the books you will realize that women adhere much more than men. Men especially the young ones don't want to come for treatment when they are diagnosed, because they don't want their friends to know that they are HIV positive, they may be afraid of stigma and the fact that young ladies might not want to enter into a relationship with them. But for the women because they are mostly pregnant at the time of diagnosis, they most of the time return for treatment to protect their babies from acquiring the infection, and so they adhere to treatment." (Health professional, Sunyani Municipal Hospital)

"Women are much more adherent than men. Men like to take risk, so they wait until they are ill before they take their medication or visit the facility for treatment." (Health professional, Sunyani Regional Hospital)

Table 2: Gender, Age, Education, and Adherence to ART

Variables	**Adherent**		**Non-adherent**		**P value**
Gender	frequency	%	frequency	%	0.317
Female	57.0	63.3	22.0	73.3	
Male	33.0	36.7	8.0	26.7	
Total	90.0	100.0	30.0	100.0	
Age					0.520
18-29	21.0	23.3	11.0	36.7	
30-39	25.0	27.8	8.0	26.7	
40-49	27.0	30.0	7.0	23.3	
50 and above	17.0	18.9	4.0	13.3	
Total	90.0	100.0	30.0	100.0	
Education					0.195
Primary	19.0	21.1	9.0	30.0	
Junior high	35.0	38.9	10.0	33.3	
Senior high	27.0	30.0	6.0	20.0	
Tertiary	6.0	6.7	1.0	3.3	
No education	3.0	3.3	4.0	13.4	
Total	90.0	100.0	30.0	100.0	

Perceived Efficacy and Perceived Need for Treatment and Adherence to ART

There was no statistically significant relationship between perceived efficacy and ART adherence ($p = 0.062$), and perceived need and ART adherence ($p = 0.736$) as indicated in Table 3.

Table 3: Perceived Efficacy and Perceived Need for Treatment and Adherence to ART

Variables	**Adherent**		**Non-adherent**		**p-value**
Perceived efficacy	frequency	%	frequency	%	0.062
Better	86.0	95.6	28.0	93.3	
No change	0.0	0.0	2.0	6.7	
Worse	2.0	2.2	0.0		
Indifferent	2.0	2.2	0.0		
Total	90.0	100.0	30.0	100.0	
Perceived Need for treatment					0.736
Yes	88.0	96.7	29.0	96.7	
No	2.0	3.3	1.0	3.3	
Total	90.0	100.0	30.0	100.0	

Responses from the in-depth interviews with patients however, varied from these findings. Some of them indicated that when they started the treatment and their health condition improved, they had the urge to adhere to treatment so they can stay healthy. Various experiences were shared including the following:

"As for the ART drugs, they are very good, without them I would not be alive today. I have been on treatment for about 9 years prior to taking ART drugs, but I was not healthy. I had low weight and chronic illnesses, currently, I am very healthy. I have a good appetite for food which also boosts my immune system, so I'm always encouraged by my improved health condition to take my ART medications." (Patient, Sunyani Municipal Hospital)

"*Ever since I started treatment, I have never fallen sick before. Initially I experienced drug side effects so the drugs were changed, now I am very healthy. How can I even think of missing my medications, they give me life"* (Patient, Sunyani Regional Hospital)

"As for the drugs, they are difficult to take especially when you start at first, but once your system adjusts to them and they are working for you, then you realise you can never do away with them, so you feel the need for them especially when they are even getting finished" (Patient, Sunyani Regional Hospital)

"As for me the ART medications really work for me, so I make sure I visit the hospital regularly for the drugs. At the beginning I was having some problems, but the nurses explained to me that they will stop if I continue to take the drugs regularly and on time, and truly those bad feelings gradually subsided. Infact, the drugs work and that encourages me to stick to them. I'm even afraid that if I don't take them for one day, my health condition will deteriorate" (Patient, Sunyani Municipal Hospital)

Social Factors and Adherence to ART

Support, stigma, disclosure of HIV positive status and adherence to ART

Findings from the study as shown in Table 4 indicate that there was no statistically significant difference between existence of support (P = 0.96), stigma (P = 0.96), disclosure of HIV positive status (P = 0.059) and adherence to ART. Thus, social support in the form of support from other family members and friends and stigma after disclosure of HIV positive status to someone either in the family or outside the family had no influence on adherence to ART.

These findings again were not supported by the qualitative part of the study. The in-depth interviews revealed that support from loved ones in the form of financial aid, encouragement, information, reminders to take medications improved adherence to ART. Some also indicated existence of support as a major facilitator of adherence to ART. Respondents who were presumed to have acquired the disease from their unfaithful partners received immense support from family members.

"My husband was diagnosed of HIV and he died months after his diagnosis. After his death, I was sick for a long time and admitted at the hospital. At that point, I was also diagnosed of HIV. Regardless of my status, my family members gave me all the assistance I needed. They have been my source of motivation. Currently, I visit hospitals to counsel other people with the disease to adhere to medication" (patient, Sunyani Regional Hospital)

"I have a nurse friend who assists me in diverse ways. I receive support from my family members and the nurse friend as well. When I am unable to go for my medication at the hospital, my sister take them on my behalf. The nurse friend also gives me encouragement to cope with the disease. Without the support from these people in my life I wouldn't be alive today." (Patient, Sunyani Municipal Hospital)

All the health professionals interviewed also clearly indicated that support from 'relevant others' aids adherence to ART treatment.

"Some patients have mental conditions as a result of the disease so they may not appreciate the need to take medication so the supporter helps in adhering to medication as scheduled." (Health professional, Sunyani Regional Hospital)

Table 4: Support, Stigma, Disclosure of HIV Positive Status and Adherence to ART

Variables	**Adherent**		**Non-adherent**		**P value**
Existence of support	Frequency	%	Frequency	%	0.96
Yes	80.0	88.9	23.0	76.7	
No	10.0	11.1	7.0	23.3	
Total	90.0	100.0	30,0	100.0	
Existence of stigma					0.96
Yes	4.0	4.4	0.0	-	
No	77.0	85.6	24.0	80.0	
No response	9.0	10	6.0	20.0	
Total	90.0	100.0	30.0	100.0	
Disclosure					0.084
Good relation	20.0	22.2	1.0	3.3	
Receive support	59.0	65.6	23.0	76.7	
Aid adherence	1.0	1.1	0.0	0.0	
No response	10.0	11.1	6.0	20.0	
Total	90.0	100.0	30.0	100.0	

Belief in spirituality, traditional medicine, and Adherence to ART

Statistically, there was no significant relationship between belief in spirituality and adherence to ART ($p = 0.815$). In the same vain there was no statistically significant relationship between belief in traditional medicine ($p = 0.084$) and adherence to ART (Table 5).

These findings were supported by the findings from the in-depth interviews with patients. Patient interviewees indicated that they did not rely on spiritual healing nor traditional medicine as cure for HIV. Some however indicated that prayer is regarded as a complementary remedy to HIV cure.

"It is good to pray, but the medicine is important. Once you know your status you have to take the drugs as scheduled and pray that God in his mercies will heal you." (Patient, Sunyani Regional Hospital)

"I go to church and pray that I will be completely healed, but I still take my medications." (Patient, Sunyani Regional Hospital)

"As for traditional medicine for HIV, I have taken some before, and it was good for treating diarrhoea, but they are not as effective as the ART drugs, so I don't depend on traditional medicine anymore." (Patient, Sunyani Municipal Hospital)

"At times some priests tell you they can pray for you to be healed completely, and that will make you stop taking your medication, but that is not true, your condition might worsen, and may end up dying, so *I don't believe in that kind of spiritual healing, that does not mean I don't believe in God."* (Patient, Sunyani Municipal Hospital)

Interviews with the health professionals however, portrayed that belief in spirituality hindered their clients from adhering to treatment.

"Clients generally adhere to treatment, and when they get better, about 40% discontinue with the medication and resort to prayer camps for cure, they only return when their health condition deteriorates. By that time, some may not be eligible for the ART treatment anymore and they die." (Health professional, Sunyani Municipal Hospital)

Table 5: Belief in Spirituality, Belief in Traditional Medicine and Adherence to ART

Variables	**Adherent**		**Non-adherent**		**P value**
Belief in spirituality	frequency	%	frequency	%	0.815
Yes	26.0	28.9	8.0	26.7	
No	64.0	71.1	22.0	73.3	
Total	90.0	100.0	30.0	100.0	
Belief in traditional medicine					0.084
yes	24.0	26.3	12.0	40.0	
No	66.0	73.3	18.0	60.0	
Total	90.0	100.0	30.0	100.0	

Service Delivery Factors and adherence to ART

Relations with Health Professionals, perceptions about service provision and privacy, and ART adherence

There was a statistically significant relationship between relations of patients with health professionals and adherence to ART (p = 0.008). Also, perception about services and privacy in the facility had a statistically significant relationship with adherence to ART (p = 0.008 and p = 0.001 respectively) as shown in Table 6.

Table 6: Relations with Health Professionals and Adherence to ART

Variables	**Adherent**		**Non-adherent**		**P value**
Perception of service delivery	Frequency	%	frequency	%	0.008
Satisfactory	78.0	86.7	18.0	60.0	
Average	10.0	11.1	10.0	33.3	
Dissatisfied	1.0	1.1	2.0	6.7	
Indifferent	1.0	1.1			
Total	90.0	100.0	30.0	100.0	
Respect from staff					0.629
Yes	86.0	95.6	28.0	93.3	
No	4.0	4.4	2.0	6.7	
Total	90.0	100.0	30.0	100.0	
Privacy					0.001
Yes	88.0	97.8	24.0	80.0	
No	2.0	2.2	6.0	20.0	
Total	90.0	100.0	30.0	100.0	
Satisfactory Communication					0.065
Yes	88.0	97.2	27.0	90.0	
No	2.0	2.2	3.0	10.0	
Total	90.0	100.0	30.0	100.0	

These were not too different from the findings from the in-depth interviews. Participants expressed that there was a good relationship between them and their health providers. This relationship enabled them to comply with medication requirements. Some patients however, indicated that some health workers do not treat them well, but this does not deter them from going to the hospital for their medication and taking them regularly.

"We don't have any problem with our health providers. Health workers attend to us very well. They keep our information private, and are good to us. We are able to tell them the challenges we face and they listen to us, so we are comfortable and we obey them by taking our medications as scheduled." (Patient, Sunyani Municipal Hospital)

"There are some few health workers who do not treat us with respect, and these are usually new staff, this does not affect the taking of my medication." (Patient, Sunyani Municipal Hospital)

Availability of drugs, counseling, and adherence to ART

Respondents receive ARVs for free at the health facilities which in many ways contributed to adherence to ARV. However, they bear the cost for non-ARVs which are purchased outside the health facility. As indicated in Table 7, the availability of drugs had a statistically significant relationship with adherence to ART ($p = 0.008$). There was also a statistically significant relationship between relevance of counseling and adherence to ART ($p = 0.018$).

Responses from the in-depth interviews revealed that the facilities sometimes faced drug shortages. But drugs are dispensed such that every client received at least a month supply of drugs to enhance continuity of treatment. If a particular drug was out of stock, health professionals switch the regime and supply alternative drugs. This initiative was regarded as a barrier to adherence by all patient in-depth interviewees.

"Initially, the doctors used to give 5 months interval for appointment and we were given drugs to cover that period. Of late, the doctor can give 2 months interval but the pharmacist dispense drugs to cover for only two weeks. It makes it difficult adhering to these separate schedules. We travel long distances to attend ART services. I will appreciate if the system is revised to reduce transportation cost. Once you are not sick, the pharmacist should provide drugs to cover 6 months to enhance our ability to adhere to treatment requirements."(Patient, Sunyani Municipal Hospital)

Table 7: Availability of Drugs, Counseling and Adherence to ART

Variables	Adherent		Non-adherent		P value
Supply of drugs at facility	frequency	%	frequency	%	0.008
Yes	81.0	90.0	21.0	70.0	
No	9.0	10.0	9.0	30.0	
Total	90.0	100.0	30.0	100.0	
Payment of drugs					0.562
Yes	25.0	27.8	10.0	33.3	
No	65.0	72.2	20.0	66.7	
Totals	90.0	100.0	30.0	100.0	
Affordability of drugs					0.397
Yes	79.0	87.8	28.0	93.3	
No	11.0	12.2	2.0	6.7	
Totals	90.0	100.0	30.0	100.0	
Regular counseling					
					0.187
Yes	85.0	94.4	30.0	100.0	
No	5.0	5.6	0.0	0.0	
Total	90.0	100.0	30.0	100.0	
Relevance of Counseling in ART adherence					0.018
Yes	85.0	94.4	24.0	80.0	
No	5.0	5.6	6.0	20.0	
Total	90.0	100.0	30.0	100.0	

Barriers to ART Adherence

The factors that hindered adherence to ART as found by the study were service delivery factors. Respondents generally had less challenges with health professionals (34.2%, n=41/120). Those who expressed some challenges attributed them to delay at the pharmacy, delay in service delivery, health workers not prompt to work, drug refill schedules and preferential treatment, transportation cost, cost of non ARVs and treatment requirements as barriers they faced. See Table 8.

Table 8: Barriers to ART Adherence

Variable	frequency	percentage
Challenges with health professionals		
Delay in service delivery	16.0	13.3
Delay at the pharmacy	35.0	29.2
Workers not prompt to work	10.0	8.3
Drug refill schedules	9.0	7.5
Preferential treatment	9.0	7.5
No challenge	41.0	34.2
Total	120.0	100.0
Availability of drugs and ART adherence		
transportation cost as a barrier	35.0	29.3
motivation derived from free drug supply	61.0	50.8
treatment requirement as a challenge	7.0	5.8
cost of non ARV drugs as a barrier	13.0	10.8
No response	4.0	3.3
Total	120.0	100.0

Similar barriers were raised in the in-depth interviews. Respondents had a challenge with service delivery at the pharmacy. There were complaints that usually they spend almost the whole day at the clinic waiting for drugs. This was due to the fact that staff at the pharmacy do not start work early. Some were emphatic that they dodged their employers to come for refills so if they are delayed, it creates a lot of problems for them at the work place.

*"I'm satisfied with the kind of treatment I receive from the health professionals. My major challenge is time spent at the pharmacy. I try to come early so I can go back to my daily activities but I end up spending the whole day at the clinic. Now the time is 11am the staff at the pharmacy are now coming to work. We have complained several times but nothing has been done about it." – (*Patient, Sunyani Regional Hospital*)*

"*When I go to work first, I cannot leave for the hospital, so I usually go to the hospital first and very early, so I can go to work, but here is the case where I always have to go to work very late if I have to visit the hospital, because there are a lot of delays in the service delivery in this facility. Presently, my boss is not nice to me because of my lateness to work*." (Patient, Sunyani Regional Hospital)

Differences in Adherence to ART among Patients of Sunyani Regional and Municipal Hospitals

The findings indicated in Table 9 depict no significant difference in adherence to ART among respondents of the two study health facilities (p=0.673).

Table 9: Differences in Adherence to ART among Patients of the Two Study Facilities

	Adherence		Non-adherence		P value
Health facility	Frequency	%	frequency	%	0.673
Municipal	46.0	51.1	14.0	46.7	
Regional	44	48.9	16.0	53.3	
Total	90	100.0	30.0	100.0	

Discussion

Antiretroviral therapy is an important management regime for HIV and AIDS especially in this era where a cure for HIV is yet to be realized. Thus, the drug combination therapy suppresses the virus in the blood stream, limiting its destructive ability on the immune system of the infected, and thereby preventing opportunistic infections. Information about the disease process, treatment procedure, drug resistance, non-adherence and its effects are vital for attaining compliance to ART. This information is usually well communicated to patients at the start of treatment for them to understand the rationale, however, many scholars assert that non adherence to ART is common among HIV and AIDS patients (Carlucci *et al.,* 2006; Nachega *et al*., 2006; Olowookere *et al.,* 2008). In this study, respondents exhibited knowledge on the need to adhere to ART, with the majority (75%) adhering in the seven-days assessment. This is necessary if involvement of patients in HIV treatment is to be achieved to enhance their commitment to treatment (Machtinger & Bangsberg, 2006), which is vital for effective treatment.

General drug compliance is usually influenced by individual factors. Thus, daily activities like travels, busy schedules, funerals, and others as found in the study can make people forget to take their medication or leave them behind (Forgarty *et al*., 2002). On this, patients can be sensitised by their counsellors as a way of reminding them to taking their medications amidst these activities. Feeling of being healthy, and reluctance to disclose HIV positive status also affects adherence (Olowookere, Fatiregun, Akinyemi, Bamgboye, & Osagbemi, 2008). A lot of studies have been carried out on the individual attributes that affect ART compliance (Boyarinova, 2007; Spirea *et al.,* 2002; Murray *et al.,* 2009; Grierson, Koelmeyer, Smith, & Pitts, 2011; Lucas, Chaison, & Moore 1999; Reif, Golin & Smith 2005). Some identified gender, age, literacy level, employment, knowledge on the disease, treatment side effects as well as medication scheduling as factors that influence adherence.

In our study, the quantitative findings did not indicate statistically significant relationship between individual factors like age, gender, perceived efficacy and need for ART and adherence, the qualitative findings indicated associations between these variables and adherence to ART. Non adherence was associated with young men, and this was attributed by health professionals as young men being less capable of long term therapy, and fear of rejection and stigma from the society especially from young women. Contrary to this finding, other studies indicate high non-adherence rates in women (Bailey *et al.*, 2014; Murray *et al.*, 2010; Nagarina, Popenoe,Kilewo, Biberfeld, & Ekstrom, 2013; Hanif *et al*., 2013). Some of the reasons being stigma and low empowerment on the part of women to access treatment especially in the developing world. Fogarty *et al.,* (2002)

however, disagree that gender has influence on adherence to ART and indicate age as a factor in adherence. What accounts for the disparity in these findings may be contextual, hence, it should be noted that women and men experience different forms of barriers when it comes to HIV issues (Ferguson, Stewart, Funkhouser, Westfall, & Sagg, 2002), and therefore, interventions should be such that they address the specific needs of both men and women.

Perceived efficacy and need for ART was also regarded as factors that influence adherence by participants in the qualitative study. Individuals who regard ART as a curative measure usually discontinue treatment when their health condition improve (Gokran, Narkheda, Pardeshi, & Doibale, 2012; Karcher, Odera, Kurz & Harms 2007; Murphy *et al*., 2000). Similarly, there were some participants who discontinued treatment after observing improvement in their health. Others too were motivated to adhere to ART because they saw improvement in their health. They were informed to adhere to prevent them from going back to their previous bad health condition. These people regarded ART as important because they had achieved benefit through the efficacy of treatment. Consistently some studies have identified that achievement or benefit derived from medication to influence adherence to ART (Holstad, *et al*., 2006; Luszczynska, Sarkar & Knoll, 2007; Simoni *et al.*, 2006). Belief that ART is important to ensure good health is an important basis for adherence to ART. Thus, individuals who think they need to take medication only when they are sick, usually are non-adherent to ART (Murphy, Roberts, Martin, Marelich, & Hoffman, 2000). This underscores the importance of persistent sensitization on the fact that ART does not cure, but manages HIV and AIDS and non-adherence can result in serious health consequences.

Social factors like the absence of stigma (Curioso, Kepka, Cabello, Segura, & Kurth, 2010; Rintamaki, Davis, Skripkauskas, Bennette, & wolf, 2006), support by a significant other, and disclosure of HIV positive status aid adherence (Afolabi *et al*., 2013; Fredriksen-Goldsen, *et al*., 2011; Nachegba *et al.*, 2006). The service providers in this study seemed to be in the known as they indicated that as part of their treatment procedures, each client is asked to present a treatment supporter, whose duty is to monitor clients in the absence of a health professional. This strategy enabled respondents to have someone to support them. Some participants indicated in the qualitative study that less stigma after disclosure made it easier for them to adhere to treatment. They were able to disclose their status to family members and friends who in turn support them to adhere to treatment requirements. Disclosure of status led to support because health professionals pass confidants 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 less stigma among study participants, amidst this, respondents were careful with making people identifying them as HIV and AIDS patients. Many people tend to conceal their treatment, seek treatment far away or wait till no one is watching before they take medication to prevent discrimination from their friends and loved ones. Thus, persistent stigma associated with HIV in the family and community is a drawback to treatment compliance (Mshana *et al*., 2006; Padarath, Searle & Esu-Williams, 2006). Families and communities must therefore be continuously sensitized to eradicate stigma against HIV and AIDS patients.

Whilst some studies have found culture and religion as barriers to ART adherence (Olowookere *et al.*, 2008; Wanyama, *et al*., 2007; Walker *et al.*, 2004), our findings on these indicated otherwise. Thus, reliance on spirituality and the use of traditional medicine were not common with respondents. Their decision to stick to ARVs was influenced by counseling services, which convinced them that HIV had no cure and adhering to medication was the only way to live long in good health. However, some health professionals indicated their client's defaulted treatment

because of reliance on spirituality, and these people usually revert to the health facilities for help that is impossible to provide.

Health professionals play a vital role in achieving optimal adherence to ART. The sort of relation that exists between them and their clients influences clients' decision to continue or discontinue treatment (Beach, Keruly, & Moore, 2006; Murphy *et al.*, 2000). From the study, privacy and perception on services had statistically significant relationship with ART adherence (p=0.008). This was attributed to supportive non-judgmental care from health providers which sort to place clients' need first. This enabled respondents to accept treatment procedure and adhere to them. It was emphasized in the qualitative study that information was kept confidential which made them express their challenges freely for them to be addressed. This made respondents listen to every instruction given by health professionals and heeded to them, thus, confirming that trust, privacy and confidentiality with health professionals is associated with adherence to ART (Golin, Lui & Hays, 2002; Remien, Hirky, Johnson, Weinhardt, Whittier, 2006; Posse & Baltussen, 2009).

Another factor that aided adherence in the study was availability of affordable drugs. Availability of drugs at the facility was statistically and significantly related to adherence to ART (p=0.008). Respondents receive drugs at the facility for free which motivate them to adhere to refill schedules. These drugs are mainly antiretroviral drug combinations that are subsidized. The supply system also ensure that each respondent received drugs when he or she came for refill to ensure continuity of treatment. As indicated by WHO (2009), without effective drug supply system, adherence to ART cannot be achieved. Health workers at the study facilities were informed on the need to have regular drug supply to respondents which accounted for their ability to adhere to treatment.

Other service delivery factors that influenced adherence to treatment were health education in the form of counseling (p=0.018), and monitoring. These activities were done on regular basis at the health facilities for HIV patients and their families. Respondents received regular counseling which informed their positive behaviour towards ART adherence. Health promotion activities therefore facilitate adherence to ART by informing patients on how HIV is managed and how to live a normal life in good health and should be carried out by all health facilities that provide ART services. For respondents at the Sunyani Municipal hospital, the location of clinic days is a threat to stigma for them. HIV and AIDS cases are handled with other out-patients department cases. This exposed their clients to stigma which is a treat to ART adherence. There is thus, the need for a separate facility for HIV cases to enhance service delivery.

With regards to barriers to ART adherence, respondents indicated delay in service delivery, drug scheduling, cost of non-ART drugs and transportation cost as the main barriers to ART adherence. There are different appointments for drugs and consultations which made respondents spend much on transportation. Transportation cost for drug refill has been identified as a barrier in other studies (Hardon, Akurut & Comoro, 2007; Kangee & Delport, 2010; Mills *et al.*, 2006; Trzynka & Erlen, 2004). In addition, delay in service delivery especially at the pharmacy is a challenge for most respondents. This delay was associated to workers being late to work most of the time, and preferential treatments given to patients who are familiar to health workers. This was a major concern since some respondents have to stay away from their workplaces to seek healthcare. Finding excuses all the time to leave work for the clinic is difficult for a lot of patients especially those that are hiding their HIV status from colleagues, and is therefore a challenge to ART adherence (Hardon *et al.*, 2007).

From the perspectives of the health professionals, non-availability of drugs, inadequate personnel including doctors, nurses, and counselors, insufficient supply of logistics for the treatment of HIV and AIDS like reagent for testing CD4 count, among others impede the success of ART efficiency as was also indicated by Padarath, Searle and Esu-Williams in 2006. The Sunyani Municipal Hospital for instance had no clinician to attend to HIV and AIDS clients. Health professionals lamented that there are increasing numbers of patients with few staff to handle them. This makes it stressful dealing with HIV and AIDS clients. Some health professionals indicated that some patients who felt healthy and refused to adhere to clinic schedules, but were found to refill their drugs on schedule, made the treatment procedure incomplete and made identification of defaulters inaccurate as well.

There were no differences in adherence to ART among patients of the two study facilities. This may be attributed fact that the two facilities share similar service delivery structures. Responses from health professionals indicated that the study facilities shared the same ART adherence issues. They used identical procedure to attend to clients and had clients with comparable demographic and social characteristics. Both facilities attend to clients from Brong-Ahafo and beyond, and also, employ national guidelines which are in harmony with the WHO measure for treatment of HIV and AIDS.

Conclusion

Adherence to antiretroviral therapy is crucial for sustained health among HIV patients, and it is dependent on the individual, social, and facility-based support systems. Individuals living with HIV and AIDS would be committed to improving their health and living long for their families, if these factors are positive. Hence, some barriers to treatment adherence, such as different schedules of appointment for drugs and consultations, unavailability of drugs and health personnel, delay in service delivery at various departments in the health facility, should be addressed holistically by all ART stakeholders.

Health professionals, though satisfied with their work, need to be motivated. It is therefore recommended that more health professionals be trained and motivated to deliver quality and efficient ART services to enhance adherence. It is also suggested that the management of the study hospitals organize special events to motivate their staff in charge of ART. This will enable them continue their good work on improving the lives of people living with HIV and AIDS.

Last but not the least, non-antiretroviral drugs meant to compliment ART to improve the health of patients are expensive. It may be worthwhile to consider subsidizing these drugs especially for patients who cannot afford, but cannot do without them. This will heighten their commitment to adhering to antiretroviral therapy.

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