Assessment of Adherence to Therapy and Medication Knowledge Among HIV/AIDS Patients in Presidential Emergency Plan for AIDS Relief (PEPFAR) Unit of University of Benin Teaching Hospital (UBTH)

Abstract

Comment [A1]: Convert it to a structured abstract

Antiretroviral therapy (ART) has made it possible for treating HIV/AIDS as a chronic and manageable infection. HIV patients who receive effective therapy and adhere to it have similar survival rates as people who are not infected. People living with HIV/AIDS (PLWHA) are given the medications without charge at authorized clinics across Nigeria. Despite being readily available, adherence with ARV medication therapy is still a serious challenge. This study was therefore aimed at assessing the adherence level to antiretroviral therapy and medication knowledge among HIV/AIDS patients in the University of Benin Teaching Hospital, PEPFAR Unit.

A total of 400 consenting participants who were 18 years and above and had been on antiretroviral therapy for a minimum of two months were included in the study. A standardized self-reported structured questionnaire which included questions on demographic characteristics and health related information, medication adherence questions which helped to assess level of adherence and questions which helped to assess patients' knowledge of their medication was used for data collection. Basic descriptive statistics, Cross Tabulation, Chi-square test, and binary logistic regression analysis were carried out to analyze the data.

64.3% of the respondents were within 38-57 years, 74.8% were female and 25.3% were male, 59.5% were married, 50.3% attended secondary School, 75.0% were self-employed, 98% Christian and their major monthly income fell within #21,000-#30,000 and 66.5% were on two (2) medications. Adherence to ART was observed in 74% of the study participants. Comorbidity (peptic ulcer disease) and increased number of medications taken were significantly ($p < 0.05$) associated with ART non-adherence among the study participants. There was no statistically significant difference in adherence level across the age groups, gender, and level of education. Majority of the study participants (64.5%) had a good ARV medication knowledge and there was a positive association between medication knowledge and adherence to ARV medications. Hence, there is a need for medication knowledge education during counseling for both old and new patients.

Keywords: Adherence, antiretroviral medications, antiretroviral therapy (ART), People living with HIV/AIDS (PLWHA), medication knowledge.

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1. Introduction

Comment [A2]: Reduce introduction

Among all the pandemics the world has ever witnessed, Acquired Immune Deficiency syndrome (AIDS) is one of the most lethal. The very first AIDS cases were reported in 1981, and at this period the human immunodeficiency virus (HIV) rapidly spread and was globally fatal. The introduction of antiretroviral therapy (ART) has made it possible for treating HIV/AIDS as a chronic and manageable infection. Currently, it is expected that HIV patients who receive effective therapy will have similar survival rates as people who are not infected (Bhaskaran *et al*., 2008; Wing, 2016). Numerous initiatives have been launched over time to better the lives of people living with HIV/AIDS (PLWHA).

After the careful application of the treatment guidelines for the various classes of antiretroviral (ARV) medications that ushered in the fixed drug combinations in 1996 as "highly active antiretroviral therapy"(HAART), also known as "combined antiretroviral therapy,"the long-term success of ART was observed after the year 2000. However, despite the considerable reduction in mortality and transmission risk, later research has demonstrated that neither the effectiveness of the medications nor the refined HAART principles can replace the requirement for strong adherence to ART in the treatment of HIV/AIDS patients.
However, HIV patients are projected to require an adherence level exceeding 95% in order to achieve undetectable viral levels (Chesney, MA. 2003).

Comment [A3]: Can be deleted

84.2 million [64.0-113.0 million] persons have contracted the HIV virus since the epidemic's start, and roughly 40.1 million [33.6-48.6 million] have died from it (WHO, 2021). At the end of 2021, there were 38.4 million [33.9-43.8 million] HIV-positive individuals worldwide. According to estimates, 0.7% [0.6%–0.8%] of adults in the world between the ages of 15 and 49 have HIV, while the severity of the epidemic continues to vary greatly between different nations and areas (WHO, 2021). Nearly one in every twenty-five persons (3.4%) in the WHO African Region are still infected with HIV, making up more than two-thirds of all HIV-positive people globally (WHO, 2021).

Comment [A4]: Quote more recent data if available

Although the regional prevalence of HIV infection is nearly 25 times higher in sub-Saharan Africa than in Asia. Almost 5 million people are living with HIV in South, South-East and East Asia combined. After sub-Saharan Africa, the regions most heavily affected are the Caribbean and Eastern Europe and Central Asia, where 1.0% of adults were living with HIV in 2011(USAID, 2012).

Comment [A5]: Reduce this paragraph

HIV infection has no known cure. However, with increased access to excellent HIV prevention, diagnosis, treatment, and care, especially for opportunistic infections, HIV infection has become a manageable chronic health condition, allowing those living with HIV to live long and healthy lives (WHO Fact Sheet, 2021).

Even though there has been a 33% decrease in new infections worldwide from 3.4 million in 2001 to 2.3 million in 2012 and a corresponding decrease in AIDS deaths from 2.3 million in 2005 to 1.6 million in 2012, which shows that significant progress has been made globally toward the 2015 targets and elimination commitments, there are still many obstacles to overcome (NACA, 2014).

Comment [A6]: Quote more recent data if available

HIV/AIDS still remains a major problem for the worldwide public health sector because of its gravity. The disease is economically significant since it burdens society with sickness and mortality, particularly those fully contributing to the economy through their productive labor (Barnett, 2005). Being a sexually transmitted disease, HIV is associated with stigma and persons in underdeveloped nations are less likely to freely come out in public, be tested, know and report their status, and be prepared to undergo therapy and counseling as needed.

Comment [A7]: remove

Despite the extensive efforts made by several nations throughout the world to prevent the disease's spread and educate those who are living with it, millions of people are still dying from HIV/AIDS, and there are still new cases of infection being recorded. This is related to the fact that some PLWHA who are prescribed antiretroviral (ARV) medications still forget to take their medications, and the scheduling of each dose is not rigorously followed.

Comment [A8]: Write refrences

The rise of HIV strains that are resistant to treatment might be as a result of poor adherence. Less than 95% adherence to ART has been associated with treatment failure and the establishment of viral mutants resistant to the existing ARV medications (Illiyasu *et al*, 2005).

In the absence of medication or when receiving subtherapeutic therapy, the Human Immunodeficiency Virus (HIV) quickly mutates. This raises the possibility that an at-risk population would contract multi-resistant HIV, which might have an impact on public health.

Comment [A9]: Reference needed

Nevertheless, medication resistance can develop whether or not a patient follows their treatment plan. After ceasing medication, plasma HIV-RNA levels in patients with undetectable viral loads have been reported to swiftly recover, sometimes even reaching pre-therapy levels in less than 21 days. This demonstrates the significance of taking ARV medications continuously, even when undetectable plasma viremia levels have been reached.

Therefore, it is crucial to take antiretroviral medications as directed without skipping or lowering doses (Leslie *et al*, 1998).

Purpose of the Study: The main purpose of this study was to assess adherence level to ART among PLWHA in UBTH and their medication knowledge.

Comment [A10]: Mention both the objectives

2. Materials and Method

Research Design

A cross-sectional descriptive study that sets out to determine respondent's adherence to and knowledge of their medications.

Study Setting

This study was proposed and conducted at the PEPFAR units of UBTH Benin City, Nigeria.

Study Participants

The study participants were HIV/AIDS patients receiving treatment at PEPFAR unit of UBTH.

Inclusion Criteria

HIV/AIDS patients who were 18 years and above and had been on ARV therapy for a minimum of two months.

Exclusion criteria

HIV/AIDS patients who were less than 2 months on ARV therapy and HIV/AIDS patients who were less than 18 years and those who did not give informed consent.

Comment [A11]: Remove as already mentioned in inclusion criteria

Time Frame for the Study

The questionnaire-based data collection was carried out February, 2022.

Comment [A12]: Correct language

Data Collection

The data was collected through a face-to-face interview format with the use of structured and standardized questionnaire.

Instrument for Data Collection

Data was collected by the use of a standardized questionnaire which consists of three sections:

Comment [A13]: Do not repeat information

Section I: This section collected socio –demographic data

Section II: This section consists of the Medication compliance questionnaire(MCQ) which helped to assess level of adherence and was developed using the Morisky self- reporting scale,

Comment [A14]: Was this questionnaire validated and how? Also details of this scale is needed like min and max, no of questions, cut-off values etc?

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Hill-bone Compliance to High blood Pressure therapy scale and Morisky Medication Adherence Scale (N.S Ahmad et al., 2013).

Section III: This section consists of questions which helped to assess patient's knowledge of their medication.

Sampling Technique

A convenience sampling method was used.

Sample Size Determination

An estimate of the sample size was done using the Cochran formula:

$$n = \frac{Z^2 P(1-P)}{e^2}$$

Where e = margin of error

P = population proportion (standard of deviation)

Z = z-score (use of z table)

n = more than 10,000

Using confidence interval of 95%, z-score = 1.96 and standard deviation of 0.5 and margin of error of 5%

The sample size (n) = $\frac{1.96^2 \times 0.5(1-0.5)}{0.05^2} = 384$

To make up for addition, 20% of the above was added.

Data Analysis

Questionnaires were retrieved from the respondents, coded and the data entered into Microsoft excel. This was transferred to Statistical Package for Social Science for Windows (Version 16.0.1) for statistical analysis. The categorical data such as sex, race, age, duration of disease, comorbidities, and level of education were presented as frequency and percentage. Cross tabulations were used to classify the respondents based on characteristic variables into adherent and nonadherent. Chi-square test was used to test the correlation between adherence and non-adherence. A confidence level of 95% was accepted. Binary logistic regression analysis was conducted to identify factors associated with non-adherence, while adjusting for covariates. Variables analysis with a P-value 0.05 were included in the logistic regression model analysis to identify factors that could significantly affect non-adherence.

Comment [A15]: This will be proportion and reference of study required

Comment [A16]: Mention the final sample size and reason for this 20% additional

Comment [A17]: What was the cut-off for adherent and non-adherent group?

Comment [A18]: It tests association NOT correlation

Comment [A19]: Exact p-values of 0.05?? Language needs correction

Comment [A20]: Since title mentions adherence so factors of adherence should be mentioned not non-adherence

3. Results

Out of the four hundred (400) patients administered the questionnaire, all the patients returned their questionnaire giving a response rate of 100%.

Demographic Information of the Respondents: The frequency and the percentages of the characteristics considered under the demographic information (such as age, sex, etc.) of the respondents are shown in Table 1.

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Table 1: Social Demographic Characteristics of the respondent (n=400)

Social-Demographics Characteristics	Total (N)	Percentage (%)
Age		
18-37	78	19.5
38-57	257	64.3
58-77	65	16.3
78 and above	Nil	Nil
Sex		
Male	101	25.3
Female	299	74.8
Marital Status		
Single	74	18.5
Married	238	59.5
Divorced	22	5.5
Widowed	58	14.5
Separated	8	2
Level of Education		
Primary	85	21.3
Secondary	201	50.3
Tertiary	104	26.0
None	10	2.5
Occupation		
Government Sector	58	14.5
Private Sector	29	7.3
Self Employed	300	75.0
Unemployed	11	2.8
Student	2	5
Religion		
Christian	392	98.0
Muslim	7	1.8
Traditionalist	1	0.3
Atheist	Nil	Nil
Others	Nil	Nil
Monthly Income (Naira)		
15,000-20,000	116	29.0
21,000-30,000	166	41.5
31,000-50,000	58	14.5
51,000-100,000	41	10.3
Above 100,000	19	4.8
Comorbidities		
Stroke	Nil	Nil
Peptic Ulcer	40	10
Hypertension	40	10
Diabetes	5	1.3
CKD	Nil	Nil
Duration of HIV/AIDS		

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Less than 5 years	118	29.5
6-10 years	87	21.8
11-20 years	185	46.3
Above 20 years	10	2.5
Number of drugs taken		
One	34	8.5
Two	266	66.5
Three	94	23.5
Four and more	6	1.5

Among the 400 participants, majority (64.3%) were within the age range of 38-57 years. There were more female (74.8%) respondents than male (25.3%) and slightly above half (59.5%) of the respondents were married while 18.5% were singles, 14.5% widowed and 5.5% were divorced whereas 2% were separated.

Majority (50.3%) of the respondents attended secondary school and 26.0% attended tertiary institution while those who attended primary school and those with no formal education accounted for the remaining percentage.

Respondents were predominantly self-employed (75.0%) and those under government sector (14.5%) while those under private sector, the unemployed and students account for the rest of the population.

The predominant religion observed was Christianity (98.0%) and the majority of the respondents' monthly income were within #21,000-#30,000.

Of all the chronic illness surveyed; the main comorbidity was peptic ulcer disease (n=40, 10%), hypertension (n=40, 10%) and diabetes (n=5, 1.3%).

A total of 185 (46.3%) of the respondents had been diagnosed of HIV/AIDS for 11-20 years and in terms of number of ARV medications greater fraction of the participants were on two (2) medications.

Comment [A21]: Reduce text to decrease repetition from tables

Respondents' Adherence to ARV Drugs: The response to the questions in the Medication Compliance Questions (MCQ) and the summary of the MCQ score are presented in Table 2 and Table 3 respectively.

Table 2: Patients' Response to the Medication Compliance Questions (MCQ)

Medication Compliance Questions (MCQ)	Response			
	Never	Sometimes	Often	Always
How often do you forget to take your medicine?	211(52.8)	188(47)	1(3)	Nil
How often do you decide not to take your medicine?	368(92)	31(7.8)	1(3)	Nil
How often do you miss taking your medicine	375(93.8)	25(6.3)	Nil	Nil

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because you feel better?				
How often do you decide to take less of your medicine?	341(85.3)	58(14.5)	1(3)	Nil
How often do you stop taking your medicine because you feel sick due to the effects of the medicine?	383(95.8)	17(4.3)	Nil	Nil
How often do you forget to bring along your medicine when you travel away from home?	347(86.8)	53(13.3)	Nil	Nil
How often do you not take your medicine because you run out of it at home?	353(88.3)	47(11.8)	Nil	Nil

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Table 3: Summary of the MCQ Score and Adherence Status (n=400)

Total Score (28points)	Frequency	Percentage	Inference
28(100%)	165	41.25	Adherent
27(>95%)	131	32.75	Adherent
23-26(>80%-95%)	96	24	Non-adherent
18-22(>60-80%)	8	2	Non-adherent
<18(<60%)	Nil	Nil	Non-adherent

A score of 27-28 was considered to be adherent whereas any score below 27 was considered to be non-adherent.

Comment [A22]: Scale and cut-offs to be mentioned in methods not here

There were 296(74%) subjects who were categorized as adherent and 104 (26%) who were categorized as non-adherent and the most common reason for non-adherent was forgetfulness.

Respondents' Medication Knowledge Score

The response from medication knowledge assessment and the medication knowledge score are presented in Table 4 and Table 5 respectively.

Table 4: Patients' Response to the Medication Knowledge Questions

Medication Knowledge Questions	Responses (%)	
	Yes	**No**
Do you know the name of each of your medications?	42(10.5)	358(89.5)

Do you know the correct dose(s) of your medication(s)?	399(99.8)	1(0.2)
Do you know when to take your medication(s)?	400(100)	Nil
Do you know how to take your medication(s)?	400(100)	Nil
Do you know what each of your medication does for you?	259(64.8)	141(35.2)

Table 5: The Impact of Medication Knowledge on Adherence

Medication Knowledge Score (%)	Frequency	Percentage	Adherence n (%)	Non-adherence n (%)
20	Nil	Nil	Nil	Nil
40	1	0.3	Nil	1(100)
60	141	35.3	103(73.0)	38(27)
80	216	54	162(75)	54(25)
100	42	10.5	30(71.4)	12(28.6)

Comment [A23]: How was this score calculated to be mentioned in methods?

From the survey, only 42 (10.5%) were able to score 100% and majority of the respondents 216 (54%) scored 80% therefore 258 (64.5%) of the participants medication knowledge score was above 70% and those that had this high score were more adherent compared to those whose medication knowledge score were below 70%. This indicates that majority of the participants had substantial knowledge about their medication but most of the participants do not know the name of their medication (89.5%) and the numbers of those who do not know what each of their medication(s) does were considerably high (35.2%).

Association between the Predictor Variables and Non-adherence

The participants were categorized as adherent and non-adherent in line with the predictor variables included in the study which includes the demographic characteristics as shown in Table 6.

Table 6: Determination of the association between socio-demographic data and adherence among study participants

Socio-Demographics Characteristics	Total N (%)	Adherent n (%)	Non-adherent n (%)	P-value

Comment [A24]: Was appropriate correction used where required for chi square test? And which correction was used

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Age				0.7928
18-37	78(19.5)	60(76.9)	18(23.1)	
38-57	257(64.3)	187(72.8)	70(27.2)	
58-77	65(16.3)	49(75.4)	16(24.6)	
78 and above	Nil	Nil	Nil	
Sex				0.6490
Male	101(25.3)	73(72.3)	28(27.7)	
Female	299(74.3)	223(74.6)	76(25.4)	
Marital Status				0.3439
Single	74(18.5)	58(78.4)	16(21.6)	
Married	238(59.5)	171(71.8)	67(28.2)	
Divorced	22(5.5)	20(90.9)	2(9.1)	
Widowed	58(14.5)	46(79.3)	12(20.7)	
Separated	8(2.0)	1(12.5)	7(87.5)	
Level of Education				0.3746
Primary	85(21.3)	60(76.5)	20(23.5)	
Second	201(50.3)	152(75.6)	49(24.4)	
Tertiary	104(26.0)	70(67.3)	34(32.7)	
None	10(2.5)	9(90)	1(10)	
Occupation				0.4432
Govt. Sector	58(14.5)	39(67.2)	19(32.8)	
Private Sector	29(7.3)	23(79.3)	6(20.7)	
Self-Employed	300(75.0)	224(74.7)	76(25.3)	
Unemployed	11(2.8)	10(90.9)	1(9.1)	
Student	2	Nil	2(100)	
Monthly Income				0.4772
15,000-20,000	116(29)	85(73.3)	31(26.7)	
21,000-30,000	166(41.5)	126(75.9)	40(24.1)	
31,000-50,000	58(14.5)	46(79.3)	12(20.7)	
51,000-100,000	41(10.3)	25(61.0)	16(39.0)	
Above 100,000	19(4.8)	14(73.5)	5(26.3)	
Religion				0.6480
Christian	392(98.0)	291(74.2)	101(25.8)	
Muslim	7(1.8)	4(57.1)	3(42.9)	
Traditionalist	1(0.3)	1(100)	Nil	
Atheist	Nil	Nil	Nil	
Others	Nil	Nil	Nil	
Co-morbidity				**0.0038**
PUD	40(10)	22(55)	18(45)	0.1973
Hypertension	40(10)	33(82.5)	7(17.5)	0.7500
Diabetes	5(1.3)	4(80)	1(20)	
Duration of HIV/AIDS				0.4204
Less than 5yrs	118(29.5)	87(73.7)	31(26.3)	
6-10yrs	87(21.8)	72(82.8)	15(17.2)	
11-20yrs	185(46.3)	129(69.7)	56(30.3)	
20yrs and above	10(2.5)	8(80)	2(20)	**0.0102**
Number of Drugs				

Comment [A25]: Why 3 p-values for co-morbidities?

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Taken			
1	34(8.5)	29(85.3)	5(14.7)
2	266(66.5)	199(74.8)	67(25.2)
3	94(23.5)	67(71.3)	27(28.7)
4	6(1.5)	1(16.7)	5(83.3)

To determine whether the demographic variables such as age, sex, marital status, level of education, occupation, religion, monthly income, comorbidity, duration of disease and number of drugs taken are associated with adherence/non-adherence in the study participants, of all the variables only comorbidity (peptic ulcer disease) and number of drugs taken were significant at 5% level (p<0.05) and two variables were then considered in binary logistic regression as shown in Table 7.

Comment [A26]: Adjusted and crude OR to be mentioned. Model fit and model characteristics also to be mentioned. Reference category to be added

Table 7: Logistic Regression for Variables Predicting Non-adherence in HIV/AIDS Patients in UBTH (n=400)

Comment [A27]: Number of individuals in each category to be also mentioned

Variable	**OR (95%CI)**	**P-Value**
PUD	**2.764 (1.366-5.594)**	**0.05**
Number of Drugs taken	**0.611 (0.418-0.893)**	**0.011**

Participants with peptic ulcer disease as comorbidity were found to be less adherent to their medications. (i.e. 2.764 times less adherent) as compared to HIV/AIDS patients who had no comorbid disease condition.

Number of drugs taken was another factor related to non-adherence in this study. An increase in the number of drugs taken was directly proportional to non-adherent.

Comment [A28]: Linear relationship cannot be established

4. Discussion

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Demographics Characteristics

Comment [A29]: More comparisons with similar studies is needed

There were twice as many female respondents as there were men. The physiological explanation for this is linked to the fragility of the vaginal wall that made it susceptible to blisters and abrasions that could offer a route for the transmission of Sexually transmitted diseases of which HIV is inclusive (Ajuwon, 1996-97).

The female reproductive system acts as a receptor. When HIV-positive semen is present during coitus, it can remain for a longer time in the female body compared to that of a male. Consequently, women are more susceptible to infection than men. Women frequently visit hospitals for prenatal care during childbirth, and during this time, their HIV status is easily determined.

Middle-aged people, or those between the ages of 38 and 57, were found to be the study participants who were most affected. Thus, it was shown that HIV/AIDS primarily affects healthy, strong, and able-bodied men and women at the peak of life.

This finding is consistent with the UNAIDS 2002 report.

Comment [A30]: Reference to be added

The majority of responders were married, followed by the singles and the widowed since the impact of HIV is heavier on the sexually active population. The marital status of the respondents was observed not to have any significant effect on adherence which is in line with the finding of Lauretta I. O. (2013) and Afolabi et. al. (2006). The more knowledgeable (educated) one is, the more informed a person is, and the more adherent to therapy the person is likely to be. However, this study's findings showed the opposite. It was found that the uneducated (90% of the population) adhered slightly more than the educated. This might be explained by the small percentage of study participants who lacked formal education and hence were unable to provide accurate results.

Generally, most of the people affected were the self employed (75.0%) and those engaged in government sectors (14.5%). This supports the idea that HIV primarily impacts the labor force and, inevitably, every section of the country's economy. However, in this study, occupation did not influence adherence.

The majority of the participants (98%) were Christians, which could be attributed to the fact that the study was conducted in an area of Nigeria where Christianity is the predominant religion. Due to the large number of respondents' (75.0%) self-employment, the majority of respondents' monthly incomes fall between $21,000 and $30,000, and as a result, this generally will affect their diet and other lifestyle choices that will impact on the adherence.

Comorbid HIV/AIDS patients typically take additional medications from different pharmacological class, which tends to increase the pill burden and promote non-adherence. This was consistent with the finding of Talam et al., (2008). Peptic ulcer disease, hypertension, and diabetes were the three most prevalent chronic illnesses identified throughout the survey, although only peptic ulcer disease was found to be significantly linked with nonadherence.

In terms of the number of ARV medications taken, a larger percentage of participants (66.5%) were taking two (2) medications, but adherence levels were higher in those taking just one medication (85.3%). As a result, the number of drugs taken was significantly associated with nonadherence, and this can be attributed to the increase in the number of pills taken.

Adherence to Antiretroviral Therapy

Regarding medication adherence, there have been variations in the findings reported from different studies. As shown in Table 3 of this study, 74% of the study participants in this survey demonstrated adherence, which is similar to the results from Uzochukwu et al. (2009), where 75.3% of the participants demonstrated adherence, and Lauretta I. O. (2013), where 79.20% of the respondents demonstrated adherence.The significantly high level of adherence in this study

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could be related to the fact that there is a high level of awareness for HIV in the study setting because of the daily health education and counseling, free medication, improved and patient-friendly clinic courtesy of PEPFAR, UNAIDS, and the Global Fund.
The level of adherence in this survey could also be linked to the fact that majority of the respondents' medication knowledge score were above 70% (n=258, 64.5%), since those with medication knowledge score above 70% where more adherent.

Medication Knowledge and it's Impact on Adherence

Majority of the respondent’s medication knowledge score was above 70%(n=258,64.5%) and participants with medication knowledge score above 70% were found to be more adherent compared to those whose medication knowledge score were below 70% and as such there is positive association between medication knowledge and adherence. Despite this observation, there was no significant association between medication knowledge score and non-adherence this could be linked to the small percentage of study participants whose medication knowledge score were below 70% which may be significantly small for any comparison to be made.
The fact that the study was conducted at one of the oldest university teaching hospitals, that has witnessed many HIV and AIDS awareness programs over the years, may be related to the high medication knowledge score seen in the majority of participants.
However, other researchers discovered that PLWHA who were less educated were less likely to adhere to their medication (Golin et al, 2002). Hence, there's need for patients’ medication knowledge education during counseling for both old and new patients.
Nevertheless, health care professional is in the best position to disseminate appropriate information for better treatment outcome (Yao Potchoo et al., 2010). To that end, Patient education on medication regimens is essential in order to improve adherence.

Conclusion

Comment [A31]: Conclusion needs to be short, only 1 paragraph and according to the results of your study

With the introduction of ARV medications, HIV has been reduced from being viewed as a fatal illness to a chronic condition, with perfect adherence to ARV medications being a key indicator of success. Young, sexually active, physically fit people (aged 38 to 57), who make up the workforce in every country, were more affected by the human immunodeficiency virus. This is why HIV has a drastic impact on every sector of the economy if the disease is not controlled.
Age, sex, educational level, marital status, and occupation were all demographic characteristics that did not significantly affect ARV drug adherence in this study.
Over half of the patient’s respondents (74%) were adherent to their ARV medications.
Non-adherence was associated with comorbidity (PUD) and number of drugs taken. Reasons for non-adherence included forgetfulness and inadequate knowledge of ARV, which may have been caused by the respondents' poor educational levels. The fact that 50.3% of respondents have completed secondary education suggests that the majority of respondents are able to comprehend simple instructions.
Factors found to be associated to increase adherence are medication knowledge scores above 70% (of which 64.5% of the respondent’s medication knowledge score where above 70%), fewer number of drugs taken, absence of comorbidities. Therefore, in order to strengthen the PLWHA's healthy life seeking behavior and weaken the lifestyles that undermine adherence, health education should be encouraged.

Ethical considerations

Ethical approval with protocol number "ADM/E 22/A/VOL.VII/14831266" was obtained from the ethics committee of the University of Benin Teaching Hospital (UBTH).

Informed consent

Informed consent was obtained from prospective participants and afterwards they were assured of anonymity.

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