

**KNOWLEDGE, RELIGIOSITY, SPIRITUALITY AND ANTI-  
RETROVIRAL TREATMENT ADHERENCE AMONG HIV PATIENTS  
IN A TEACHING HOSPITAL IN EKITI STATE, NIGERIA**

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## **Abstract**

**Background:** Human immunodeficiency virus (HIV) is a chronic condition that warrants stern medication adherence, possibly influenced by spirituality or religion. HIV/AIDS is still a public health concern especially with the continuous increased in the number of new infections. The study was carried out in this setting due to high influx of patients at the facility. At served as referral centre for HIV/AIDS in the state and the only state government-owned tertiary hospital.

**Objective:** The study assessed knowledge and influence of spirituality on HIV/AIDS patients' adherence to treatment at a Teaching Hospital in Ekiti State, Nigeria.

**Method:** The study employed a cross sectional and descriptive research design using a sample size of 250 participants. Purposive and convenience sampling techniques were used and semi-structured adapted questionnaire was used. Data analysis was through descriptive and inferential statistics.

**Results:** The study revealed high level (81.0%) of adherence, while there was high level (68.2%) of spirituality and religiosity (75.6%). Also, marital ( $X^2= 40.377$ ,  $p= 0.000$ ), religion ( $X^2= 15.557$ ,  $p= 0.004$ ) and occupation ( $X^2= 36.354$ ,  $p= 0.000$ ) were significantly associated with participants' knowledge level. Age ( $X^2=8.448$ ,  $p= 0.004$ ), monthly income ( $X^2=4.895$ ,  $p= 0.027$ ) and duration of diagnosis ( $X^2=4.808$ ,  $p= 0.028$ ) were significantly associated with adherence to medication. Age ( $X^2= 7.220$ ,  $p= 0.007$ ), occupation ( $X^2= 11.613$ ,  $p= 0.020$ ) and monthly income ( $X^2= 6.428$ ,  $p= 0.011$ ) were significantly associated with religiosity. However, only marital status ( $X^2= 11.745$ ,  $p= 0.008$ ) was significantly associated with spirituality.

**Conclusion:** Healthcare professionals should be conscious of the importance of spirituality in the life of HIV/AIDS patients, hence, the need to respect patients' beliefs and involve them in care planning.

**Keywords:** Knowledge, Influence, Spirituality, Religiosity, Adherence, HIV/AIDS

## **Introduction**

The human immunodeficiency virus (HIV) as a condition that is chronic necessitates stern medication adherence, however, spirituality or religion may influence this [Berman et al., 2022; Baqndata-Romeo et al., 2018; Ironson et al., 2016]. Globally, HIV/AIDS is still a public health concern especially with the continuous increased in the number of new infections, with about 45 million new cases and annual deaths of three million [UNICEF, 2023; UNAIDS, 2019]. In response to this pandemic, highly active antiretroviral therapy has been made available to patients.

However, an adherence level of 95% to the life-long medication regimen is required in order to ensure its effectiveness [Bandanta-Romero et al., 2018]. Adherence to treatment is a vital subject in the management of chronic diseases like HIV and high levels of antiretroviral compliance are essential for viral suppression so as to reduce its transmission [Prah et al., 2018]. Lee et al. [2016] also reiterated the need for a lifetime medication adherence as treatment success depends on continuous adherence to treatment. Likewise, Nduaguba et al. [2017] stated that approximately 95% adherence is necessary to avoid rapid development of drug resistance and treatment failure. Kahema et al. [2018], reported that factors such as the complexity of the drug regimen, drug toxicity, educational status, marital status, disclosure of HIV status with the aftermath stigma, employment status and type of antiretroviral therapy can influence anti-retroviral therapy adherence of patients.

Spirituality as a concept described with certain characteristic can help individuals to accept their illness, find purpose in life, have better sense of self- transcendence, and maintain relationships with higher powers [deBrito et al., 2021; Balthip et al., 2017; Foster et al., 2011]. Spirituality is said to play an important role in supporting people living with HIV/AIDS and it is significantly associated with improved CD4 count, reduced viral load, better symptoms control, and as well delay the disease progression by promoting better quality of life and longevity [Szaflarski, 2013; Ironson&Kremer, 2011]. Ransome et al. [2019], Koenig and Bussing [2010] from their studies opined that spirituality and religious belief are useful tools in the preservation of patients' physical and psychological health.

It is assumed that the various aspects of religion, just as it is with spirituality, can have positive effects on health [Bredle et al., 2011]. Ironson et al. [2011] stated that spirituality is a coping strategy that brings a sense of meaning and purpose to the lives of people when faced with illness such as HIV. The study showed a significant correlation between spirituality and treatment adherence as female patients were 1.6 times more likely to adhere to treatment regimen than their male counterparts. The study also revealed that every unit rise in spirituality scores generated 1.3 times more probability of adherence to treatment with relevant predictors.

## **Methodology**

### **Research design, setting and population**

A descriptive research design was employed and conducted in a Teaching Hospital, in Ekiti State, Nigeria. The target population were HIV/AIDS patients attending adult antiretroviral therapy clinic in the Hospital.

Sample size was calculated using a single population proportion formula as reported by Daniel, (1999) given by:

$$n = \frac{Z^2pq}{d^2}$$

Where  $n$  = sample size.  $d$  = Level of precision usually set at 0.05

$p$  = sample proportion = 0.5

$Z$  = the standard normal deviate, set at 1.96 which corresponds to the 95% confidence level.

Based on the calculation, a sample of 250 was obtained, after adjustment for a 10% non and invalid responses, the final sample size was 250.

Purposive and convenience sampling techniques were adopted for the study. According to the clinic record, an average of 40 patients attends the adult antiretroviral therapy (ART) per clinic, with two clinics per week.

The inclusion criteria for this study were patient living with HIV/AIDS; must have been on ART for at least 30 days; attending the adult anti-retroviral clinic; above the age of 20 years and are willing to participate in the study.

### **Instrument for data collection**

A standardized, semi-structured adapted questionnaire was used for data collection [Bandata-Romeo et al., 2018; Koenig & Bussing, 2010]. The questionnaire comprised of Section A and B. Section A consisted of questions that are centered on participants' socio demographic characteristics, assessment of participants' knowledge level of HIV/AIDS, adherence level to treatment medication, level of spirituality and religiosity and perceived provider-related factors influencing adherence to treatment. Section B of the questionnaire consisted of the biophysical and biochemical measurements. In this study, participants' weight, height, blood pressure, body mass index and viral load were taken.

Knowledge of respondents was graded, using 10 set of "yes or no" questions. For each correct response, one point was scored and zero point for wrong response with maximum score of 10 and minimum score of 0. Total score between 0-4 was categorized as poor knowledge, 5-7 was fair knowledge while 8-10 was categorized as having good.

Medication adherence was tested and measured using the English version of the validated eight-item self-report Morisky Medication Adherence Scale (MMAS-8) [Morisky et al., 2008]. The 8-item medication adherence scale was reliable with alpha of 0.83). Questions are formulated to avoid a "yes or no" questions for item 1-7 while question 8 has a five-point Likert response scale. Each "no" response was valued as 1 and each "yes" response was valued as 0 except for item 5, where the "yes" response was rated as 1 while the "no" response was rated as 0. For Item 8, the code (0-4) was standardized by dividing the result by 4 to calculate a summated score. Total scores on the MMAS-8 range from 0 to 8, with scores of 8 reflecting high adherence, 7 or 6 reflecting medium adherence, and <6 reflecting low adherence. Participants whose summative scores were greater or equal to 75% (a score of 6 of the maximum score of 8) were categorized as being adherent while those with less than 75% were categorized as not adherent.

Religiosity was measured using the Duke University Religion Index (DUREL) five-item measure for use in epidemiological studies [Toscanelli et al., 2022; Bredle et al., 2011]. The five-item scale in DUREL index assessed the three main dimensions of religious involvement, which are organizational, nonorganizational and intrinsic or subjective religiosity. All scores were multiplied by 5 and then divided by 27. Thus, using the overall religiosity score, a score of 1-2.0 was categorized as not religious, 2.1-3.9 was religious while an overall score between 4.0-5.0 was categorized as highly religious.

The FACIT-SP spiritual well-being (FACIT-Sp-12) was used for the measurement of spirituality [Ahmad et al., 2022; Monod et al., 2015]. Responses were scored on a 5-point Likert scale from 0 to 4. The FACIT-Sp-12 consisted of two subscales: meaning/peace (score range: 0-32) and faith (score range: 0-12). Meaning/peace score for each participant was obtained by multiplying the sum of individual item scores for the meaning/peace subscale by 8 and dividing by the number of items answered. The faith subscale score of a participant was the sum of the individual item score in the faith subscale by 4 and dividing by the number of items answered. was obtained by multiplying. A participant's overall non-illness score was calculated by summing the scores for meaning/peace and faith subscales. The overall non-illness score ranged from 0 to 48. Participants who had a summative total score  $\geq 36$  were regarded as having high spiritual wellbeing while those with lower summative total scores were regarded as having low spiritual wellbeing.

### **Data analysis and reliability**

Statistical analysis of data was done using Statistical Package for Social Studies (SPSS) version 25 software for windows. The data collected were analyzed using descriptive and inferential statistics. Descriptive statistics were calculated as frequencies, percentages and means. Test of relationship was tested for using the chi square test while association was shown using the logistic linear regression test.

Test-retest method was used for reliability and pre-test was done a week before the actual data collection with 5 participants that had similar characteristics to the study population twice and the two set of scores obtained were correlated using Pearson Product Moment Correlation, and reliability coefficient was measured to check for internal consistency. The reliability coefficient was 0.9

### **Ethical considerations**

Ethical approval with Protocol Number ERC/2021/01/08/474A was obtained from the Research and Ethics Committee of the Teaching Hospital. Participant's rights were explained and informed consent obtained and respect for the dignity of participants was prioritized all through the period of data collection. Completed questionnaire were retrieved immediately after completion.

### **Results**

A total of 242 out of the 250 distributed questionnaire were completely filled, returned and analyzed, with a non-response rate of 3.2%.

### **Socio-demographic and biophysical characteristics of participants**

The socio-demographic characteristics of the study participants revealed that 127(52.5%) were less than 50 years while the remaining rest were  $\geq$  50 years old. Most of the participants 150(62.0%) and 145(59.9%) were females and married, respectively. With respect to religion, 199(82.2%) were Christians while 186(76.9%) were diagnosed of HIV within the last 10 years (Table 1).

The biophysical profile of the participants revealed that 27(11.2%), 98(40.4%), 73(30.2%) and 44(18.2%) had body mass index (BMI) categorized as underweight, normal weight, overweight and obese. In the case of blood pressure (BP), the majority) 201 (83.1%) of the study participants were observed to have controlled BP while viral load level showed that most of the participants 154 (63.6%) had viral load of less than 20 copies/mL (Table 1).

**Table 1: Socio-demographic characteristics of the participants (N= 242)**

<b>Variable</b>	<b>Frequency</b>	<b>(%)</b>
<b>Age</b>		
< 50	127	52.5
≥ 50	115	47.5
<b>Sex</b>		
Male	92	38.0
Female	150	62.0
<b>Marital Status</b>		
Single	61	25.2
Married	145	59.9
Divorced/ Separated	9	3.7
Widowed	27	11.2
<b>Tribe</b>		
Yoruba	191	78.9
Others	51	21.1
<b>Religion</b>		
Christianity	199	82.2
Islam	26	10.7
Traditional	17	7.0
<b>Occupation</b>		
Unemployed	31	12.8
Farmer	21	8.7
Petty trader	56	23.1
Business	65	26.9
Civil/public servant	69	28.5
<b>Educational level</b>		
Primary	46	19.0
Secondary	73	30.2
Tertiary	123	50.8
<b>Income (in Naira)</b>		
< 30,000	133	55.0
≥ 30,000	109	45.0
<b>Duration of diagnosis (in years)</b>		
< 10	186	76.9
≥ 10	56	23.1
<b>Body mass index (BMI)</b>		
Underweight	27	11.2
Normal weight	98	40.4
Overweight	73	30.2
Obese	44	18.2
<b>Blood pressure</b>		
Controlled	41	16.97
Uncontrolled	201	83.1
<b>Viral load</b>		
< 20 copies/ml	154	63.6

> 20 copies/ml	83	36.4
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**Participant’s knowledge level of HIV/AIDS**

The participants’ knowledge of the HIV/AIDS revealed that 105(43.4%), 68(28.5%) and 69(28.5%) had poor, fair and good knowledge of the disease, respectively. Apart from participant’s marital status ( $X^2= 40.377$ ,  $p < 0.001$ ), religion ( $X^2= 15.557$ ,  $p= 0.004$ ) and occupation ( $X^2= 36.354$ ,  $p< 0.001$ ) that showed significant association with knowledge of the disease, none of the other demographic characteristics were significantly associated (Table 2).

**Table 2: Participant’s knowledge level of the HIV/AIDS**

	Knowledge level			X <sup>2</sup>	P
	Poor	Fair	Good		
<b>Age (years)</b>					
< 50	59(24.4)	39(16.1)	29(12.0)	4.249	0.119
≥ 50	46((19.0)	29((12.0)	40(16.5)		
<b>Gender</b>					
Male	43(17.8)	27(11.6)	22(9.1)	1.568	0.457
Female	62(25.6)	41(16.9)	47(19.4)		
<b>Marital status</b>					
Married	42(17.4)	14(5.8)	5(2.1)	40.377	p <0.000
Unmarried	56(23.1)	35(14.5)	54(22.3)		
Divorced/separated	0(0)	7(2.9)	2(0.8)		
Widowed	7(2.9)	12(5.0)	8(3.3)		
<b>Religion</b>					
Christianity	92(38.0)	47(19.4)	60(24.8)	15.557	0.004
Islam	11(4.5)	12(5.0)	3(1.2)		
Traditionist	2(0.8)	9(3.7)	6(2.5)		
<b>Monthly income (Naira)</b>					
< 30,000	55(22.7)	44(18.2)	34(14.0)	3.792	0.150
≥ 30,000	50(20.7)	24((9.9)	35(14.5)		
<b>Occupation</b>					
Unemployed	13(5.4)	11(4.5)	7(2.9)	36.354	P<0.001
Farmer	8(3.3)	7(2.9)	6(2.5)		
Petty trader	11(4.5)	26(10.7)	19(7.9)		
Business	27(11.2)	12(5.0)	26(10.7)		
Civil/public servant	46(19.0)	12(5.0)	11(4.5)		
<b>Duration of diagnosis (years)</b>					
< 10	77(31.8)	56(23.1)	53(21.9)	1.888	0.389
≥ 10	28(11.6)	12(5.0)	16(6.6)		
<b>Knowledge summary</b>					
	<b>105(43.4%)</b>	<b>68(28.5%)</b>	<b>69 (28.5%)</b>		

X<sup>2</sup> and p represent Chi-square and significance values, respectively.



**Adherence level**

Generally, the majority 196(81%) of the participants were adherent to treatment with only 46(19%) indicated to be non-adherent to treatment. Among the socio-demographic characteristics, age ( $X^2= 8.448$ ,  $p= 0.004$ ), duration of diagnosis ( $X^2= 4.808$ ,  $p= 0.028$ ) and monthly income ( $X^2= 4.895$ ,  $p= 0.027$ ) showed significant association with participants' level of adherence to treatment (Table 3).

**Table 3: Participants' level of medication adherence**

	Medication adherence level		X <sup>2</sup>	P
	Non adherent	Adherent		
<b>Age (years)</b>				
< 50	33(13.6)	94(38.8)	8.448	0.004
≥ 50	13((5.4)	102(42.1)		
<b>Gender</b>				
Male	16(6.6)	76(31.4)	0.252	0.616
Female	30(12.4)	120(49.6)		
<b>Marital status</b>				
Married	12(5.0)	49(20.2)	7.164	0.067
Unmarried	22(9.1)	123(50.8)		
Divorced/separated	2(0.8)	7(2.9)		
Widowed	10(4.1)	17(7.0)		
<b>Religion</b>				
Christianity	36(14.9)	163(67.4)	3.024	0.220
Islam	8(3.3)	18(7.4)		
Traditionalist	2(0.8)	15(6.2)		
<b>Monthly income (Naira)</b>				
< 30,000	32(13.2)	101(41.7)	4.895	0.027
≥ 30,000	14(5.8)	95(39.3)		
<b>Occupation</b>				
Unemployed	6(2.5)	25(10.3)	1.659	0.789
Farmer	3(1.2)	18(7.4)		
Petty trader	11(4.5)	45(18.6)		
Business	10(4.1)	55(22.7)		
Civil/public servant	16(6.6)	53(21.9)		
<b>Duration of diagnosis</b>				
< 10	41(16.9)	145(59.9)	4.808,	0.028
≥ 10	5(2.1)	51(21.1)		
<b>Adherence summary</b>				
	46(19%)	196(81%)		

X<sup>2</sup> and p represent Chi-square and significance values, respectively

**Participants’ religiosity and spirituality level**

The participants’ extent of religiosity revealed the majority 183(75.6%) showed high religiosity level while 59(24.4%) had low religiosity. Participants’ age ( $X^2= 7.220$ ,  $p= 0.007$ ), occupation ( $X^2= 11.613$ ,  $p= 0.020$ ) and monthly income ( $X^2= 6.428$ ,  $p= 0.011$ ) were observed to be significantly associated with religiosity level (Table 4).

In the case of spirituality (none-illness) level, 153(62.8%) and 90(37.2%) of the participants had high and low levels, respectively. Apart from marital status ( $X^2= 11.745$ ,  $p= 0.008$ ), none of the socio-demographic characteristics of the participants was observed to be significantly associated with spirituality (Table 5).

**Table 4: Extent of overall religiosity of the study participants**

	Religiosity level		X <sup>2</sup>	P
	High	Low		
<b>Age (years)</b>				
< 50	105(43.4)	22(9.1)	7.220	0.007
≥ 50	78(32.2)	37(15.3)		
<b>Gender</b>				
Male	67(27.7)	25(10.3)	0.628	0.428
Female	116(47.9)	34(14.0)		
<b>Marital status</b>				
Married	41(16.9)	20(8.3)	5.515	0.318
Unmarried	112(46.3)	33(13.6)		
Divorced/separated	9(3.7)	0(0)		
Widowed	21(8.7)	6(2.5)		
<b>Religion</b>				
Christianity	149(61.6)	50(20.7)	0.441	0.802
Islam	21(8.7)	5(2.1)		
Traditionalist	13(5.4)	4(1.7)		
<b>Occupation</b>				
Unemployed	19(7.9)	12(4.9)	11.613	0.020
Farmer	16(6.6)	5(2.1)		
Petty trader	51(21.1)	5(2.1)		
Business	48(19.8)	17(7.0)		
Civil/public servant	49(20.2)	20(8.2)		
<b>Monthly income (Naira)</b>				
< 30000	109(45.0)	24(9.9)	6.428	0.011
≥ 30000	74(30.6)	35(14.5)		
<b>Duration of diagnosis (years)</b>				
< 10	146(60.3)	40(16.5)	3.602	0.058
≥ 10	37(15.3)	19(7.9)		
<b>Summary</b>				
	183(75.6%)	59(24.4%)		

X<sup>2</sup> and p represent Chi-square and significance values, respectively

**Table 5: Spirituality: None-illness level of the study participants**

	Spiritual wellbeing level		X <sup>2</sup>	P
	High	Low		
<b>Age (years)</b>				
< 50	83(34.3)	44(18.2)	0.389	0.389
≥ 50	69(28.5)	46(19.0)		
<b>Gender</b>				
Male	56(23.1)	36(14.9)	0.239	0.625
Female	96(39.7)	54((22.3)		
<b>Marital status</b>				
Married	49(20.2)	12(5.0)	11.745	0.008
Unmarried	82(38.8)	63(26.0)		
Divorced/separated	4(1.7)	5(2.1)		
Widowed	17(7.0)	10(4.1)		
<b>Religion</b>				
Christian	124(41.2)	75(31.0)	0.596	0.7421
Islam	18(7.4)	8(3.3)		
Traditionalist	10(4.1)	7(2.9)		
<b>Occupation</b>				
Unemployed	24(9.9)	7(2.9)	7.824	0.098
Farmer	9(3.7)	12(5.0)		
Petty trader	33(13.6)	23(9.5)		
Business	39(16.1)	26(10.7)		
<b>Monthly income (Naira)</b>				
< 30,000	85(35.1)	48(19.8)	0.153	0.696
≥ 30,000	67(27.7)	42(17.4)		
<b>Duration of diagnosis (years)</b>				
< 10	119(49.2)	67(27.7)	0.470	0.493
≥ 10	33(12.4)	23(9.5)		
<b>Summary</b>				
	152(62.8%)	90(37.2%)		

X<sup>2</sup> and p represent Chi-square and significance values, respectively

**Participant’s perception of health care providers**

With respect to the perception of the participants regarding the services provided by health care facility, almost all the participants considered the services to be either fair 104 (43.0%) or good 130 (53.7%) while only a minute number of participants 4(0.8%). However, there was a significant association between occupation ( $X^2= 29.371$ ,  $p= 0.03$ ) and age ( $X^2= 9.151$ ,  $p= 0.027$ ) with participants perception of services provided by health care providers (Table 6).

**Table 6: Participants’ perception of healthcare provider’s services**

Variables	Very poor	Poor	Fair	Good	X <sup>2</sup> value	p value
<b>Age (years)</b>						
< 50	4(1.7)	4(1.7)	48(19.8)	71(29.3)	9.151	0.027
≥ 50	0(0)	0(0)	56(23.1)	59(24.4)		
<b>Gender</b>						
Male	1(0.4)	0(0)	56(23.1)	45(18.6)	5.083	0.1667
Female	3(1.2)	4(1.7)	58(24.0)	85(35.1)		
<b>Marital status</b>						
Married	1(0.4)	2(0.8)	15(6.2)	43(17.8)	14.328	0.111
Unmarried	3(1.2)	2(0.8)	68(28.1)	72(29.8)		
Divorced/separated	0(0)	0(0)	5(2.1)	4(1.7)		
Widowed	0(0)	0(0)	16(6.6)	11(4.5)		
<b>Religion</b>						
Christianity	4(1.7)	4(1.7)	90(37.2)	101(41.7)	5.757	0.451
Islam	0(0)	0(0)	7(2.9)	19(7.9)		
Traditionalist	0(0)	0(0)	9(3.7)	10(4.1)		
<b>Occupation</b>						
Unemployed	0(0)	3(1.2)	9(3.7)	19(7.9)	29.371	0.003
Farmer	0(0)	0(0)	15(6.2)	31(12.8)		
Petty trader	0(0)	0(0)	25(10.3)	31(12.8)		
Business	2(0.8)	0(0)	32(13.2)	31(12.8)		
Civil/public servant	2(0.8)	1(0.4)	23(9.5)	43(17.8)		
<b>Monthly income (Naira)</b>						
< 30,000	1(0.4)	4(1.7)	61(25.2)	67(27.7)	5.916	0.116
≥ 30,000	3(1.2)	0(0)	43(17.8)	63(26.0)		
<b>Duration of diagnosis (years)</b>						
< 10	4(1.7)	4(1.7)	77(31.8)	101(41.7)		
≥ 10	0(0)	0(0)	27(11.6)	29(12.0)		
<b>Summary</b>						
	<b>4(0.8%)</b>	<b>4(0.8%)</b>	<b>104(43.0%)</b>	<b>130(53.7%)</b>		

X<sup>2</sup> and p represent Chi-square and significance values, respectively.

**Relationship of religiosity, spirituality and medication adherence of the participants**

Binary logistic regression of analysis revealed age ( $p= 0.033$ ,  $B= 0.920$ ) to be positively correlated with religiosity while marital status ( $p= 0.013$ ,  $B= -0.525$ ) and viral load ( $p= 0.009$ ,

B= -0.966) were however observed to be negatively correlated. In the case of participants' spirituality, religion (p= 0.031, B 0.836) and BMI (p= 0.020, B= 0.579) showed significant positive correlation. However, gender (p= 0.008, B= -1.192) while health care provider's factors (p < 0.001, B= -4.351) were negatively correlated. Furthermore, marital status (p < 0.00, B= 0.862) and health care provider's factors (p= 0.037, B= 0.492) showed significant positive correlation with medication adherence while body mass index (p= 0.018, B= -0.411) was negatively correlated.

**Table 7: Association between participants medical adherence with religiosity and spirituality**

Variables	B	S.E.	Wald	Sig.	Exp(B)
<b>Religiosity</b>					
Age	.920	.431	4.560	.033	2.510
Gender	.143	.390	.135	.713	1.154
Marital status	-.525	.212	6.104	.013	.592
Reli	.082	.316	.068	.795	1.086
Income	.539	.378	2.033	.154	1.714
Diagnosis duration	.578	.539	1.146	.284	1.782
Health care provider factors	.120	.266	.203	.652	1.127
Body Mass Index	.094	.209	.201	.654	1.098
Blood pressure	-.079	.590	.018	.893	.924
Viral load	-.966	.369	6.853	.009	.381
<b>Spirituality</b>					
Age	-.341	.496	.472	.492	.711
Gender	-1.197	.451	7.061	.008	.302
Marital status	.100	.244	.167	.683	1.105
Religion	.836	.387	4.659	.031	2.308
Income	.852	.464	3.375	.066	2.344
Diagnosis duration	.176	.532	.109	.741	1.192
Health care provider factors	-4.351	.504	74.612	.000	.013
Body Mass Index	.579	.248	5.453	.020	1.784
Blood Pressure	-.044	.611	.005	.943	.957
Viral load	.547	.453	1.460	.227	1.729
<b>Adherence</b>					
Age	-.087	.335	.068	.794	.916
Gender	.193	.306	.397	.529	1.212
Marital status	.862	.212	16.567	.000	2.367
Religion	.463	.291	2.532	.112	1.589
Income	-.184	.295	.389	.533	.832
Diagnosis duration	-.587	.355	2.737	.098	.556
Health care provider factors	.492	.235	4.357	.037	1.635
Body Mass Index	-.411	.174	5.590	.018	.663
Blood Pressure	-.458	.404	1.282	.257	.633
Viral load	-.252	.311	.657	.418	.777

‘B’, ‘S.E.’ ‘Wald’, Sig. and Exp(B) represent coefficient of X, standard error, Wald Chi-Squared Test value, significant value and odds ratio, respectively

## **Discussion**

More than half of the participants (52.5%) in this study were less than 50 years old. It is reported that young people are most at risk of HIV infection due to risky practices such as illicit drug use and unsafe sexual practices. The effect of HIV is said to be high among the youths with continuous report of new cases especially among homosexuals, black males and bisexual men [Berman et al., 2022; Daramola et al., 2019].

Majority of the participants in the study were adherent to their treatment regimen. The study revealed a mean treatment adherence rate of 81%, which was higher than the treatment adherence level of 70.8% reported by Salami *et al.* [Salami et al., 2010] in their study on adherence to antiretroviral medication in Ilorin, Nigeria. Increase access of patients to antiretroviral medications, the shift from using multiple drugs to the combined form as well as training of treatment adherence counselors could be attributed to the improved treatment adherence found in current study. In this study, treatment medication adherence was predicted to be dependent on age, income and viral load of the study participants. The level of adherence has been associated with family support, relationship with clinician and regular clinic visit [Brandao et al., 2020; Negesa et al., 2017]. In a study by Negesa et al. [2017], adherence to antiretroviral treatment among female respondents was 59% with the main reasons for non-adherence attributed to absentmindedness and been away from home. While adherence level was significantly related to support from family, relationship with healthcare professionals and adherence to stipulated follow up care as well as other adherence measures.

In this study, a little more than half of the study participants had fair and good knowledge about HIV/AIDS and its treatment. In some related studies [Boateng et al., 2013; Batamwta et al., 2011], good knowledge about HIV/AIDS positively correlated with adherence to anti-retroviral treatment. When reporting on knowledge, attitude and practice regarding HIV/AIDS, Nubed and Akoachere [2016] indicated that 62.1% of participants who had high knowledge level of HIV/AIDS were more likely to displayed positive attitudes toward HIV infection and treatment. This observation was similar to the findings of Thanavanh et al [2013] where it was indicated that adequate knowledge of HIV/AIDS resulted in high level of treatment compliance. In a study on the advancement of gender equity in HIV treatment, it was posited that failure to perceive HIV/AIDS as a personal risk has prevented commitment to behavior change so, the knowledge and awareness of HIV/AIDS is high with low-risk perception [Durojaye, 2006].

More than half of the study participants could be adjudged to have high level of spirituality and religiosity. Spirituality and religion play vital roles in treatment adherence level and treatment outcomes of people living with HIV [Berman et al., 2022; Brandao et al., 2020]. According to Ransome et al. [2019] spirituality can be measured by the level of peace and comfort obtained from one’s faith, the spiritual coping and well-being of a person and it embraces the emotional as well as the personal expression of the sacred.

Freitas et al. [2015], indicated that negative coping style can be linked to bad adherence which can mean the absence of spiritual connection with God, struggling spiritually or inability to find the reason for one’s existence. Some of the struggles can include the individual questioning

the existence of God, not sure of God's love and acts or the person can even conclude that the problem is a sort of punishment from God or it is from an evil influence. In related studies by Ayuk et al. [2017] and Kremer et al. [2014] indicated that spirituality is a coping strategy that brings a sense of meaning and purpose to patients' lives especially when faced with illness like HIV. This finding was however at variance with the observation of Vyas et al. [2014] whose report indicated that patients who are likely not to adhere to their treatment regimen are those who frequently join religious programmes, pray with faith and also believed that God will not abandon them.

In addition, adherence to medication is indicated to be more achievable when the person showed an optimistic coping style, trust in God, give positive meaning to life and also maintained spiritual connections [Randsome et al., 2019]. It is vital to create dedicated units that will supervise the incorporation of spirituality and conventional care in hospitals such as the use of volunteers who provide free spiritual care to patients and staff [Luchetti et al., 2016]. It is believed that such care will address patients' spiritual needs thereby providing a favorable mechanism for their treatment adherence. Similar studies by Berman et al. [2022] and Huguélet et al. [2019], explained the readiness of patients to share religious concerns with health care professionals will help in rendering proper care and thus psychological and spiritual support to treatment adherence. In the same view, Koenig [2012] and Stolovy et al. [2020] in their study revealed more patient's engagement and relationship with clinicians that have better understanding of religion and spirituality.

Thus, promotion of cultural awareness and the willingness of healthcare professionals to support patients should be encouraged within the health system. It was reported by Arrey et al. [2016] that relationship between a patient and a health care professional should be more than a provider-consumer model. Health professionals should not only render desired services to patient but engage them in negotiations that can convince and push them to treatment adherence. Spirituality could be incorporated in health care intervention as it has been mentioned as a significant coping strategy for people living with HIV/AIDS although there is limited information to support this. Thus, the inclusion of spirituality into the treatment plan could help to improve patient health outcome due to better adherence [Brandao et al., 2020; Oji et al., 2017]. Grosseohme et al. [2020] mentioned that holistic care that include patient spirituality as well as religion as a factor might help to improve patients' abilities to cope with their health conditions. Likewise, improvement of health care workers' knowledge about spirituality and beliefs could assist in the provision of comprehensive care that may encourage treatment adherence. This study therefore investigates knowledge and the role of spirituality in treatment adherence among HIV/AIDS patients in a Teaching Hospital in a Ekiti State, Nigeria.

### **Conclusion**

This study revealed the positive influence of religious and spirituality on adherence to anti-retroviral treatments by the patients attending antiretroviral therapy clinic in the Teaching Hospital. Findings showed that the level of knowledge of the participants about HIV infection and treatment was satisfactory. The study also revealed high level of spirituality and medication adherence by the participants. It was also discovered that participants perceived healthcare provider factors influenced adherence to treatment as health education, counseling, privacy and confidentiality, healthcare provider attitude and perceived positive effect of medication were enjoyed at high level.

The study further revealed a significant relationship between spirituality and treatment adherence and recommends that healthcare professionals should be conscientious of the importance of spirituality in the life of HIV/AIDS patients, hence, the need to respect patients' beliefs and inculcate them while planning patient care.

### **Ethical considerations**

Prior to the commencement of the study, ethical approval with Protocol Number ERC/2021/01/08/474A was obtained from the Research and Ethics Committee of the Teaching Hospital.

### **Consent to participate**

Participant's rights were explained and informed consent obtained and respect for the dignity of participants was prioritized all through the period of data collection.

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### **Conflict of interest**

The authors declare no competing interest.

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