Comparative Study of Antiretroviral Medication Adherence Amongst Plwha in Selected Districts of Taraba State, Nigeria

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Abstract:-

➢ *Background*

People Living with HIV/AIDS (PLWHA) benefit from Anti-Retroviral Treatment to reduce transmission and improve quality of life.

➢ *Objective*

This study Compares the level of Antiretroviral Medication Adherence among PLWHA in Selected Districts of Taraba State, Nigeria.

➢ *Methods*

Descriptive Survey was adopted using a validated questionnaire to gather information from 120 PLWHA. This followed ethical Permission from Taraba State Ministry of Health and informed consent from participants. Descriptive statistics and frequency distributions were employed in the analysis of data. Paired sample T-test for statistical significance was used to compare means of the variables. Validity and reliability of Instrument were tested with Cronbach Alpha, 0.785.

➢ *Results*

Group A reported age mean score of 35.38 ± 9.061 with age range of 18-44 and 30.60 ± 9.061 (range = 20-48), for Group B. Majority were married (61.7%) and (57%), females (66.7%) and (72%); self–employed (41.7%) and 37% respectively. While Mumuye ethnic group topped the rank in Group A (28.3%), Jenjo did for Group B but Christians, were highest for both groups (71.7% and 62%) including those with lower educational attainments (56.6% and 57% respectively). Group A reported the level of predisposing factors in HIV treatment (137-point reference scale), $\overline{X}$ = 82.17(2.18) ±11.92 and $\overline{X}$ = 80.90(2.77) ±15.15 for group B with no significant difference (P= 0.720); Reinforcing factors involved in HIV treatment on 15-points reference scale, scored $\overline{X}$ = 9.00(0.65) ±3.65 for group A and $\overline{X}$ = 8.87(0.69) ±3.78 for group B (P=0.869). Enabling factors in HIV treatment on 15-points scale reported for group A, $\overline{X}$ = 8.23(0.46) ±2.50 and $\overline{X}$ = 8.00 (0.51) ±2.77 for group B (P=0.108). Self-Reported Adherence measured on 24-points scale was $\overline{X}$ = 16.23(0.82) ±4.49 for group A and $\overline{X}$ = 17.89(0.91) ±4.99 for group B. Adherence prevalence rate however, was 67% for group A and 74% for group B.

➢ *Conclusion*

It can be observed that Antiretroviral Medication adherence is generally sub-optimal against the recommended 95% adherence level. It is therefore, recommended that Strategically targeted theory-grounded HIV intervention programs will be more effective than the usual clinic-based program for the management of HIV/ AIDS.

Keywords:- Education, Adherence, Predisposing, Reinforcing, Enabling.

I. INTRODUCTION

➢ *Background to the Study*

Thirty-seven million people currently live with HIV globally, a number of people with active TB each year also get HIV and nearly 2 Billion people are infected with TB (CDC, 2017). Out of these people, millions have died from AIDS- related causes since the beginning of the epidemic (Who, 2017). The World Health Organization (WHO) had it that over 70 million people are infected with HIV virus with death of an average of 36 million people since the first cases were reported in 1981 with 1.6 million HIV-related deaths in 2012. The most severely affected remains the Sub-Saharan region and account for 69% of the total number of people living with HIV globally (Fettig, JMS, Swaminathan, MMD, Murrill, CS and Kaplan, JMD, 2014 and Who, 2017). Out of every twenty adults, one is said to be living with the disease in this region (Who, 2017). HIV was first reported among gay men in some regions of the

United states of America in 1981 (Denis and Becker, 2006), and since then the virus has affected all people of different sexual, ethnic, geographic, and racial orientation, and has spread to all parts of the globe. The first case of HIV was reported in Nigeria in 1986 (Happy Boss, 2017) thereafter, the prevalence rose sharply and then declined, giving a national prevalence rate of 4.1% as at 2010 and 2015, 3.10 (FMH, 2015) (With a rate of 0.9% among people ages 15-49). The second largest population of people living with HIV in the world live in Nigeria (oluwaveeboy, 2014) with an estimated 210,000 deaths due to AIDS recorded in 2011 and 160, 000 (2016) in Nigeria (UNAIDS, 2017).

The disease burden is worrisome and has impacted disastrously across the globe (CDC, 2017). However, with the advent of antiretroviral medications, the disease management has been transformed. This reduced mortality from HIV infection within a period of 10 years by about 50% - 80% with resultant drop in the burden of HIV and AIDs (Gonzalo, García Goñi, and Muñoz-Fernández, 2009). Researchers have demonstrated preventive and therapeutic antiretroviral therapy benefits (Hyle and Dryden-Peterson, 2017, UNAIDS, 2016, and Bendavid, Holmes, Bhattacharya and Miller, 2012). They emphasized the importance of adherence to treatment in achieving positive clinical outcomes and bringing to halt, the progression to AIDS (Chiegil, 2017). Poor ARVs adherence is associated with grave consequences locally and globally. Poor adherence to antiretroviral therapy was a major predictor of progression to AIDS and death in a study of Gonzalo, et al, 2009, it determined failure or success of ARVs and improvement in clinical condition of the patient receiving care. Resistance strains of the virus develop with poor adherence to medication and eventually the medications lose their potency. Researchers have also argued that for best outcome from ARVs, medication adherence is standardized to be the use of not less than 95% of prescribed ARVs at a given period of medication refills (Ho, Bryson, and Rumsfeld (2009) and McKenney, Munroe, and Wright, Jr (1992).

Suboptimal ARVs adherence is a growing issue across Nigeria. Studies in Nigeria have linked poor adherence levels of ARV medications to various factors; non-adherence has been linked to educational status (Abo Deif, Elsawi, Selim, and NasrAllah, 2015, and Antonogeorgos, Panagiotakos, Grigoropoulou, Papadimitriou, Anthracopoulos Nicolaidou and Priftis, 2013), gender (Lauffenburger, Robinson, Oramasionwu, and Fang, (2014) and Berg, Demas, Howard, Schoenbaum, Gourevitch and Arnsten, 2004), Socio-Economic Status (Falagas, Zarkadoulia, Pliatsika and Panos, 2008) adverse effect of ARV medication and stigmatization (Ingrid Katz, Ryu, Onuegbu, Psaros, Weiser, Bangsberg, and Tsai, 2013, and Talam, Gatongi, Rotich and Kimaiyo, 2008). In addition, research has associated employment status, being busy at work or school, forgetfulness, fasting, and travelling away from home to non-adherence to ARVs (Suleiman and Momo. 2016 and Nachega, Uthman, Peltzer, Richardson, Mills, Amekudzi and Ouédraogo 2014). Non adherence among retroviral positive pregnant women attending clinic have also been reported (Matsui, 2012). Adherence to ARV

medication has however been linked to regular adherence counseling (Uusküla, Laisaar, Raag, Lemsalu, Lõhmus, Rüütel and Amico, 2017), the use of an adherence aid (pill box) (BMJ, 2008 and Hayes, Hunt, Adami and Kaye, 2006). Patient's educational level, marital status and occupation has been found to be significantly associated with adherence to ARVs in a study conducted in Northern Nigeria (Nachega et al, 2014). Research work done at rivers southern Nigeria in 2016 reveal a low adherence level of 71.2% (Kanu, Maduka, Okeafor (2017), the low level of adherence has also been reported in other places like Kano (Lawan, Amole, GamboJahun, EneAbute (2015). Although an intervention study using text messages and adherence counseling to improve HAART adherence in a tertiary hospital in Nigeria improved adherence to 76.9% when compared with 55.8% of the control group (Maduka, Tobin-West, 2012), this improvement still fall short of the standard cut off of ≥ 95% (Suleiman and Momo. 2016, Ho, et al, 2009 and McKenney, et al, 1992). Hence, this study sought to:

- Compare the level of predisposing factors for Antiretroviral Medication Adherence between control and intervention groups among PLWHA in Selected Districts of Taraba State
- Compare the level of Reinforcing factors for Antiretroviral Medication Adherence between control and intervention groups among PLWHA in Selected Districts of Taraba State
- Compare the level of Enabling factors for Antiretroviral Medication Adherence between control and intervention groups among PLWHA in Selected Districts of Taraba State
- Compare the level of Adherence and Appointment keeping with Health care providers between control and intervention groups among PLWHA in Selected Districts of Taraba State.

II. METHODOLOGY

➢ Design

The study utilized a one-Group Pre- and Post-Test Peer-Education intervention programme with control and addressed non-adherence to ART.

➢ Population

The population of study consisted of all the PLWHA who have been attending clinic sessions in respective health centers. Health care providers should be providing health information and instructions about their treatments.

➢ Description of Study Area

The setting for this study was northern Taraba in Nigeria, studied from April 2018 to March 2019. Taraba State has three geo-political zones, Jalingo, being the capital city. Before 1976, the state was divided into Muri, Mambilla, and Wukari. The creation of Taraba State on 27th August 1991, restructured the state into Northern, Central, and Southern Taraba. There are over 80 ethnic groups scattered over the regions, each historically having its cultural heritage. Northern Taraba has six Local Government Areas (LGAs), each vaving a General

Hospitals/ Referral Hospitals, except Jalingo, that have one Specialist Hospital, and a Federal Medical Centre. Each of these Hospitals provide health services to the PLWHA. This study drew sample from four Hospitals, General Hospital Zing Gassol named Group A and First Referral Hospital, Sunkani, Specialist Hospital, Jalingo, named Group B. These Hospitals are situated in the capital cities of Zing, Gassol, and Ardo Kola Local Government Areas respectively. State Specialist Hospital, Jalingo lies on coordinates 8∘54'N 11∘22'E, General Hospital, Zing on a latitude of 8∘59'42.72"N and a longitude of 11∘44'48.08"E, First Referral Hospital, Mutum biyu on about 8∘37'60"N and 10∘46'0"E. These Taraba State-owned hospitals pull crowd, especially from the neighboring states due to the subsidy (low cost) of care given to the PLWHA. Some Non-Governmental Organizations (NGOs) also participate actively in the care of the PLWHA, especially, in aspects of technical support, social support, drug supplies, and logistics. Some of these NGOs include but are not limited to the Global Healthplus Public Initiative (Ghepi), etc. However, as a result of the recent insurgency and Ethno-religious state of unrest in the study area, a large number of the population had been internally displaced away.

➤ *Sample Size Determination/ Sampling Technique*
The sample size formula for comparison of two (2) independent group proportion was used.

- N = (Zα + Zβ)2 x p (1 – p)

- D2

Where, Zα =1.96 and Zβ =0.1.28 are 95% confidence level desired to avoid type I error and 90% power desired for one-tailed test for type II error. D represents the minimum tolerable diference between pre- and post-intervention medication adherence for the groups of P (1-p) = 45 (1-0.45);

Where 95% Medication Adherence in HIV/AIDS Treatment is Considered Optimal

Therefore, computation shows that;

Minimum 'N' per health district = (1.96 + 1.28)2x

- 45 (1-0.45)
- 45(1-0.45)
- = 10.5

The minimum sample size per health district was 10, but up to 15 per health district will be recruited to take care of response bias.

➤ *Sampling/ Sampling Technique*
This study utilized a multi-stage sampling. First of all, simple random sampling led to a selection of northern Taraba out of the three senatorial zones. This was followed by a systematic sampling four Districts /LGAs in northern Taraba and a systematic selection of a total of 60 participants (*Peer-Educators)* drawn from these four

districts. Information was then collected about predisposing, Enabling and Reinforcing factors and adherence behavior. First Referral Hospital, Sunkani and

Specialist Hospital, Jalingo were assigned as Group A and General Hospital, Zing, and First Referral Hospital, Mutum biyu as Group B, each giving 30 Participants for the study.

- *Bias*
Only PLWHA, and their social contacts were contacted. Also, only the researchers collected the data and samples systematically drawn from the population in random fashion with blind data collection to avoid selection bias.

➤ *Variables*
Secondary dependent variables of ARV medication adherence (measured as self-reported, pill counts) respectively. Study measured primary and Independent variables and moderating variables, developed from the PRECEDE meta-model of demographic characteristics, predisposing factors, reinforcing, enabling factors and Medication Adherence including Appointment Keeping Behavior.

➤ *Data Collection Methods/Instrumentation*
Interviewer Administered questionnaire (English) with Measures conceptualized from precede model (Green 1974) was served by four trained (including interpretation to local languages) field Assistants to HIV Clinic-Attendees within a period of twenty-one days. From the precede model, variables that measured impact of peer education intervention, predisposing factors, Reinforcing, Enabling and Adherence Behavior.

Predisposing factors: Fifty-three items constitute this construct on reference scale of 137, which was further divided into 5 sub-sections as follows:

Conscious Awareness and Knowledge about HIV and Treatment: this consisted of 11 items with "Yes" or "No" response pattern on a reference scale of 11-points. Indicators used here were related to Information Adequacy about HIV Treatment and Knowledge about HIV.

Knowledge about HIV Infectivity and Treatment outcomes: Five items on a rating scale of 0–1 were used to measure this on "Yes" or "No" response pattern, on a reference scale of 5-points. Indicators used here were related to HIV viral load, medication adherence, symptoms elimination and stigmatization (eg, "HIV load cannot be significantly reduced by consistent medication", "Presently, no drug can eliminate HIV virus from the blood", etc).

Information Adequacy or Scope of contents of Health Counsel and Messages about HIV Treatment: this consisted of 6 items on reference scale of 6-points. The indicator was related to counsels delivered about ART adherence, Infant feeding options, HIV prevention and risk reduction options (eg, "we were not told about risk reduction options",

"counselling included the use of condoms", "Breast milk is the most nutritious food for infants because it contains all that the infant needs for growth and development", etc)

Perceptions about HIV Treatment: This variable was measured on a 105-points reference scale and has five sub-variables under it such as Perceived Confidence about usefulness of information received, Perceive Benefits, Perceived Threats, Perceived Barriers, and Perceived Self-Efficacy. It consists of 26 items with response pattern, "Agree" to "disagree". The 5 parts or sub-variables of perception are as follows: perceived benefits which has 6 items measured on a scale of 18 and whose indicators were related to what PLWHAs perceive as beneficial from adherence behaviour such as "Strictly keeping appointments is beneficial", "It is okay to skip only one dose of ART per week", etc.

- *The second part here was perceived threats with 10 items measured on the scale of 30 points and investigating:*
Perceived Severity of symptoms associated with AIDS. It consists of 5 items measured on 15 points scale and investigating the level to which PLWHAs perceive HIV symptoms as serious problem, such as "Symptoms of AIDS cause serious problems to life", "Having fever, cough and/ or rashes in HIV is just mild problem" and perceived severity of non-compliance to ART medication having 5 items on a 15 point scale such as, "I am tired of taking my medications", Attending every clinic appointment is tiring", etc.

The next sub-variable is perceived barrier. Indicators for this was related to the factors that serve as constraints to the adherence behaviour such as "ART drugs sometimes finish in the pharmacy", "My people do not encourage me to take my drugs", etc. This aspect consisted of 5 items measured on a scale of 15.

Perceived Self-efficacy was considered with 5 items having a scale of 15 points. Indicators for this was related to the perceived energy or determination to stop the transmission of the disease, eg, "I cannot allow anyone to contract HIV", "I will not deny my partner sex since it is, he/ she that refuses to use condom", etc. Perception of confidence about usefulness and applicability of Health Counsel and Messages delivered to PLWHAs Clinics: this variable was measured using 9 items on a scale of 27-points. It used indicators related to patients' trust, comprehension and cultural compatibility of the health information received at the HCT/ ART clinic. Such items as "I seem to have confidence in the counsel offered to me at the clinic regarding ART medication", "The instructions about Appointment keeping is clear to me", "The counsels appear to be culturally incompatible with what is applicable in the community where I live", etc.

Attitudinal Disposition of Mothers towards Health Counsel and Messages Delivered at Infant- Welfare Clinics: This variable has seven items with rating scale of 0-3, measured on a 21-point scale, measuring the attitude of

mothers towards Health information. Example of statements for consideration in this part included, "I am willing to try to follow all the counsel offered to me at the ART clinic", "I feel shy about being seen at the ART clinic all the time,".

Reinforcing and Enabling Factors in ART Medication offered by Social Support: This is the third major variable in this study consisting of two sub-variables. It has 10 items with rating scale of 0-3 and measured on a 30-point scale.

The first sub-variable, Reinforcing factors has 5 items measured on 15-point scale. Indicators for this relates to the emotional and appraisal supports accorded to the PLWHAs in the ART clinics such as, "No Family member has taken it as a duty to provide consistent care for me in my illness", "Health care personnel are emotionally distant from me".

The second part confirmed the Enabling factors as reported by respondents. Indicator for this relates to tangible services received by the PLWHAs and includes "I do not receive financial assistance from any source for my treatment", "Support group(s) assist me in providing medication subsidy reducing cost of treatment".

Medication Adherence and Appointment-Keeping Behaviour: For this variable, rating scale of 0-3 was used on 8 items with response pattern of "none of the time" to "all of the time" and measured on a 24-point scale. Indicator for this is related to Adherence and appointment keeping behaviour such as, "How often do you forget to take your ART medicines?" "How often do you keep appointments scheduled by your doctor or Nurse?", etc.

➢ *Procedure for Data Collection*
Fifteen participants selected from two Health Facilities (30) were labeled Group A. Group B was selected, 15 each from another two Health Facilities (30), baseline data was collected, followed by a development of a peer education training manual

➢ *Validity and Reliability*
The structure of constructs, contents, and items generated by my supervisor were scrutinized with necessary corrections made to ensure face validity. Construct and content validity was enhanced through literature content related to the problem under review. The development of a measuring scale ensure data accuracy. Questionnaire was Constructed from a suitable model, the precede Model, to unveil the variables for designing the instrument. Reliability was ensured by pre-testing and by testing, a retest of the developed instrument to ensure that consistency was being maintained in the measurement of what it was intended to measure. The questionnaire scales were sufficiently reliable (Cronbach Alpha 0.795), although it was noted that some scales could be improved.

➢ *Ethical Issues*
This study observed ethical research guidelines and in complied with the legal requirements for the study. Ethical clearance was obtained from relevant authorities such as implied informed consent/ permission from the Taraba State

Ministry of Health (MOH). The MOH instructed the various Hospitals to grant the researcher express access to the clinics and the participants studied.

III. RESULTS

This study utilizes Peer-Education Training Programme to optimize Antiretroviral Medication Adherence to at least 95% prevalence rate and improve appointment-keeping to 100%. The study enrolled 20 (33.3%) males and 40 (66.7%) Females (N= 60), who responded to the questionnaires. The ages of the respondents ranged between 16 years to 59 years with a mean score of 35.38 and standard deviation of 9.061, most of whom were married (37.61%) and of Christian faith (71.7%). The educational status of the respondents ranged from non-formal to higher education with majority being of the lower educational attainments (56.6%). The Mumuye ethnic group constituted majority of the respondents (28.3%), mostly, the self-employed (41.7%) as found on table 4.1.

➤ *Comparison of Predisposing Factors involved in Medication Adherence in HIV/AIDS Treatment for all groups in this study*

The level of predisposing factors in HIV-Medication Adherence measured on a scale of 137 points reference scale, scored $\overline{X} = 82.17(2.18) \pm 11.92$ for group A and $\overline{X} = 80.90(2.77) \pm 15.15$ for group B with statistically insignificant difference (P-value= 0.720). Perceptions about HIV medication Adherence was considered on 105-point reference scale and reported a mean score of $\overline{X} = 60.33(1.88) \pm 10.30$ for group A and $\overline{X} = 59.73(2.40) \pm 10.30$ for group B being statistically insignificant.

The level of Reinforcing Factors in ART Medication, on a reference scale of 15 reported a mean score of 9.00 (0.69) ± 3.56 for group A and 8.87 (0.69) ± 0.69 for group B with no significant difference (p=0.869). Enabling Factors in ART Medication, on a reference scale of 15 reported a mean score of 8.23 (0.46) ± 2.50 for group A and 8.00 (0.51) ± 2.77 for group B with no significant difference (P-value= 0.108). Self-Reported Adherence measured on a reference scale of 24 points reported a mean score of 16.23 (0.82) ± 4.49 for group A and 17.87 (0.91) ± 4.99 for group B. This revealed that the Adherence to HIV-Information and Medication instructions, including appointment keeping had no significant difference in the scores. This information is found on tables 2 and 3.

Table 1 Demographic Characteristics of Respondents in this Study

Variables	Group A (N = 60)		Group B (N=60)	
	N	(%)	N	(%)
Sex				
Male	20	33.3	17	28.3
Female	40	66.7	43	72
Marital Status				
Single	20	33.3	19	32
Married	37	61.7	34	57
Separated	3	5.0	7	12
Religion				
Christian	43	71.7	37	62
Islam	17	28.3	23	38
Education				
Non-Formal	9	15.0	7	12
Primary	8	13.3	7	12
Secondary	17	28.3	20	33
Higher	26	43.3	26	43
Ethnicity				
Mumuye	17	28.3	13	22
Tiv	7	11.7	9	15
Fulani	7	11.7	7	12
Hausa	9	15	3	
Jenjo	5	8.3	20	33
Others	15	25.0	8	13
Occupation				
Self-employed	25	41.7	22	37
Civil Servant	20	33.3	15	25
Applicant	6	10.0	11	18
Housewife	5	8.3	6	10
Student	4	6.7	6	10

Table 2 Measures of Predisposing Factors involved in Medication Adherence in HIV/AIDS Treatment at Baseline for Control and Experimental Groups

VARIABLES	Reference Scale	Group A N=60		Group B N=60		
		$\overline{X}$(SE)	±SD	$\overline{X}$(SE)	±SD	P-Value
PREDISPOSING FACTORS	137	82.17(2.18)	11.92	80.90(2.77)	15.15	0.720
Conscious Awareness and Knowledge about HIV and Treatment	11	8.67(0.22)	1.18	8.53(0.25)	1.38	0.690
Information Adequacy about HIV Treatment	6	5.00(0.17)	0.95	4.87(0.20)	1.11	
Knowledge about HIV	5	3.67(0.20)	1.09	3.67(0.18)	0.99	
Perceptions about HIV Treatment	105	60.33(1.88)	10.30	59.73(2.40)	13.16	0.845
Perceived Confidence about usefulness of information received	27	18.87(0.75)	4.13	19.50(0.92)	5.06	
Perceive Benefits	18	6.87(0.48)	2.64	6.80(0.39)	2.12	
Perceived Threat	30	15.33(0.61)	3.34	14.00(0.75)	4.09	
Perceived Barriers	15	8.70(0.54)	2.96	8.67(0.47)	2.56	
Perceived Self-Efficacy	15	10.57(0.55)	3.01	10.77(0.46)	2.56	
Attitudinal Disposition	21	13.17(0.57)	3.12	12.63(0.54)	2.98	0.501

Table 3 Measures of Reinforcing, Enabling factors and Self-Reported Medication Adherence in HIV/AIDS Treatment at Baseline for Control and Experimental.

VARIABLES	Reference Scale	Group A N=30		Group B N=30		P-Value
		$\overline{X}$(SE)	±SD	$\overline{X}$ (SE)	±SD	
Reinforcing Factors	15	9.00(0.65)	3.56	8.87(0.69)	3.78	0.869
Enabling Factors	15	8.23(0.46)	2.50	8.00(0.51)	2.77	0.108
Self-Reported Medication-Adherence and Appointment-keeping (SRMA)	24	16.23(0.82)	4.49	17.89(0.91)	4.99	0.663

*Impact Evaluation review changes recorded between baseline and post-intervention scores and their corresponding level of significance

IV. DISCUSSION OF RESULTS

➤ *Introduction*

A wide range of age categories were represented in this study which corresponds with the findings of the Federal Ministry of Health (2015) where HIV national prevalence rate was reported to be 4.1% as at 2010 and 2015 with a rate of 0.9% among people aged 15-49. Majority of the respondents were those of age categories from ages 18 to 40 years who have reached ages of accountability and now holds responsibilities for themselves and for other dependents under them. Most of the participants were also of Female gender; even though married and self-employed, many were either unmarried or separated. These are felt to be increasing their vulnerability socio-economically and emotionally. Other reasons for over representation of the female gender is felt to be due to their better health seeking behavior, they tend to have better contact with the Health Care System especially, during pregnancy where they visit the health facility for Ante-natal care (ANC) and Post-natal care. The Female gender takes up caring responsibilities; they take the sick to the health facility and resultantly use the opportunity to check-up their health status. In short, women are always concerned about themselves; especially their physical outlook and so seek care frequently than men do.

The high rate of poverty and unemployment levels, accounting for over 50% of respondents may be a factor, and which tend to have high impact on the lives of the PLWHA and which may limit their comprehension of HIV related information and hence sub-optimal adherence. The relatively low literacy status of most of the respondents, especially of the female gender (over 30% were non-formal and primary holders) and their perceived sub-servient social status is felt to account for a larger infection rate amongst them. The high population of Mumuye ethnic group (28.3%) was felt to be attributed to their culturally high social lifestyle of high vulnerability. It could also be due to the subsidy program Taraba health services enjoy and the free ART given by the National Action Committee on AIDS (NACA), which draws patients from the neighboring LGAs and States. Majority of the participants were reported to be of a Christian faith which could be due to the fact that the study area is pre-dominantly Christian (71.7%) state. However, the linkages of the respondents to the church as reported by a majority could be valuable support mobilization resource vehicle for collaborative linkages between the Health workers, PLWHA, Families, Government, NGOs and other self-support facilities that will foster HIV-Information sharing, comprehension and thus support Adherence (Tables 4.1).

The level of predisposing factors in HIV-Medication Adherence had no significant difference amongst all groups. The level of Perception about HIV had no significant difference between the groups. Attitudinal Disposition of PLWHAs towards HIV treatment, Appointment keeping and Health Counsel and Messages Delivered at HIV Clinics also showed no significant difference amongst the groups. Attitudinal Disposition of PLWHAs towards HIV treatment, Appointment keeping and Health Counsel and Messages

Delivered at HIV Clinics produced no significant difference amongst the groups. Studies in Nigeria have linked poor adherence levels of ARV medications to various factors; non-adherence has been linked to educational status (Abo Deif, Elsawi, Selim, and NasrAllah, 2015, and Antonogeorgos, Panagiotakos, Grigoropoulou, Papadimitriou, Anthracopoulos Nicolaidou and Priftis, 2013), gender (Lauffenburger, Robinson, Oramasionwu, and Fang, (2014) and Berg, Demas, Howard, Schoenbaum, Gourevitch and Arnsten, 2004), Socio-Economic Status (Falagas, Zarkadoulia, Pliatsika and Panos, 2008) adverse effect of ARV medication and stigmatization (Ingrid Katz, Ryu, Onuegbu, Psaros, Weiser, Bangsberg, and Tsai, 2013, and Talam, Gatongi, Rotich and Kimaiyo, 2008). In addition, research has associated employment status, being busy at work or school, forgetfulness, fasting, and travelling away from home to non-adherence to ARVs (Suleiman and Momo. 2016 and Nachega, Uthman, Peltzer, Richardson, Mills, Amekudzi and Ouédraogo 2014). Non adherence among retroviral positive pregnant women attending clinic have also been reported (Matsui, 2012). Adherence to ARV medication has however been linked to regular adherence counseling (Uusküla, Laisaar, Raag, Lemsalu, Lõhmus, Rüütel and Amico, 2017), the use of an adherence aid (pill box) (BMJ, 2008 and Hayes, Hunt, Adami and Kaye, 2006). Patient's educational level, marital status and occupation has been found to be significantly associated with adherence to ARVs in a study conducted in Northern Nigeria (Nachega et al, 2014).

The level of Reinforcing Factors in ART Medication had no significant difference as both groups scored an average levels of reinforcing factors in medication adherence. This phenomenon may mean that predisposing factors play greater role in medication adherence and appointment keeping with Health care professionals. This result was not different from that of the level of Enabling factors in ART medication adherence and appointment keeping which also showed no significant difference in the scores for all groups in this study.

Self-reported Adherence in this context was defined in terms of sticking firmly to HIV treatment including starting HIV treatment, keeping all medical appointments and taking HIV medicines every day and exactly as prescribed (AIDSinfo, 2019). In line with this, results revealed that the Adherence to HIV-Information and Medication instructions, including appointment keeping were the same for all groups with no significant difference in scores. Haya, Baojin, Douglas, Nicolas and William (2009) also reported similar observations following an intervention: 75.0% of previously partially adherent became adherent, and 38.7% of previously non-adherent became adherent. From foregoing, Enriquez and McKinsey (2011) and Ugwu and Eneh (2013) observed that many HIV-infected persons in developed countries face a lot of difficulties and challenges maintaining adequate levels of adherence and recommended intervention programs to boost their adherence levels.

V. CONCLUSION

From forgoing, it can be concluded that strategically targeted theory-grounded peer education training intervention program will be more effective than the usual clinic-based program for the management of HIV/ AIDS.

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