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DETERMINANTS FOR ANTIRETROVIRAL MEDICATION ADHERENCE AMONG PLWHA IN JALINGO AND ARDO KOLA DISTRICTS OF TARABA STATE, NIGERIA

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Abstract

Background: Antiretroviral Medication Adherence constitutes an important aspect of HIV treatment to reduce transmission of HIV and improve quality of life.

Objective: This study evaluates the determinants of Anti-Retroviral Medication Adherence among participants.

Methods: Survey design was adopted in this study using the precede model. Validated questionnaire was used to gather information from 120 PLWHA. This followed ethical approval from Taraba State College of Nursing Science Research Ethics Committee and informed consent from participants. Descriptive statistics and frequency distributions were employed in the analysis of data. Validity and reliability of Instrument were tested with Cronbach Alpha, 0.795.

Results: Mean age of respondents was 35.4 ± 9.061. Majority were married (62%), self –employed (42%) female (67%) Christians (72%) of Mumuye ethnic origin (28%) with lower educational attainments (56.6%). The level of predisposing factors in HIV treatment on 137-point reference scale scored $\overline{X}$ = 80.9 (2.77) ±15.15; Reinforcing factors in HIV treatment on 15-points scale, $\overline{X}$ = 8.87(0.69) ±3.78, Enabling factors in HIV treatment on 15-points scale $\overline{X}$ = 8.00(0.51) ±2.77 and Self-Reported Adherence on 24-points scale, $\overline{X}$ = 17.87(0.91) ±4.99. The adherence prevalence rate for this population was 74%.

Conclusion: Determinants for medication adherence were found to be low to average levels against medication adherence in HIV treatment. It is therefore, recommended that Strategically targeted theory-grounded intervention programs should be targeted at every program for the prevention of HIV/ AIDS.

Key words: **Demography, Education, Adherence, Predisposing, Enabling.**

Words Count: (248)

INTRODUCTION

1.1 Background to the study

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Thirty-seven million people currently live with HIV globally out of which millions have died from AIDS- related causes since the beginning of the epidemic (Who, 2017). The World Health Organization (WHO) asserted that over 70 million people are infected with HIV virus with an average of 36 million people death 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).

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Methodology

This study utilized a survey design with distribution of 125 validated interviewer administered questionnaires and return rate of 96% (120) from *PLWHA.* Data was retrieved about predisposing factors, Enabling, Reinforcing and adherence behavior, using a (Cronbach's Alpha 0.795). Each participant in Selected Secondary Hospitals in Taraba State (Location: coordinates 8º54'N, 11º22'E and 8.7557^0N, 112524^0E) gave Informed consent to participate and can decline consent at any stage of the study. Sample size was determined using the Cochran sample size formula (Israel 1992);

$$no = \frac{Z^2pq}{e^2}$$

no = the desired sample size

Z = the standard normal deviate at 95% confidence level (1.96)

P = the estimated proportion of the target population estimated to be EBF

q = 1-p;

e = desired level of precision (0.05)

$$no = \frac{(1.96)^2(0.32)\,(0.68)}{(0.05)^2} = 334$$

Finite population correction done to produce a sample size proportional to the population.

$$N = \frac{no}{1+\frac{(no-1)}{N}}$$

n = the sample size;

no= desired sample size

N = the estimate of the population size

$$N = \frac{334}{1+\frac{(334-1)}{200}} = 125$$

Questionnaires (English) with Measures conceptualized from precede model (Green 1974) was served by Three trained field Assistants to HIV Clinic-Attendees within a period of two weeks.

Predisposing factors constitute fifty-three items on reference scale of 137, Reinforcing and Enabling Factors in ART Medication offered by Social Support in this study consists 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".

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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.

DATA ANALYSIS AND RESULTS

4.0 Introduction

This chapter presents results of the study related to the variables and sub-variables derived from the objectives of study. These variables were conceptualized in the questionnaire and guided by the PRECEDE model. Analysis involved measures of sample parameter of frequency distribution, means and standard deviation of level of Predisposing, Reinforcing and Enabling factors including Perceptions and Attitudinal Predisposition of Mothers towards Health messages as well as Adherence to medication and Appointment keeping.

4.1 Demographic Characteristics of Respondents

The study enrolled 40 (33.3%) males and 80 (66.7%) Females (N= 120), 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.

Table 4.1: Frequency distribution of demographic characteristics of respondents in this study

Variables	***(N = 120)	
	N	**(%)**
Sex		
Male	20	33.3
Female	40	66.7
Marital Status		
Single	20	33.3
Married	37	61.7
Separated	3	5.0
Religion		
Christian	43	71.7
Islam	17	28.3
Education		
Non-Formal	9	15.0
Primary	8	13.3
Secondary	17	28.3
Higher	26	43.3
Ethnicity		
Mumuye	17	28.3
Tiv	7	11.7
Fulani	7	11.7
Hausa	9	15
Jenjo	5	8.3
Others	15	25.0
Occupation		
Self-employed	25	41.7

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Civil Servant	20	33.3
Applicant	6	10.0
Housewife	5	8.3
Student	4	6.7

*** Respondents in this study

4.2.1 Predisposing Factors involved in Medication Adherence and Appointment Keeping in HIV/AIDS Treatment in this study

Predisposing factors in HIV-Medication Adherence was measured on a scale of 137 points and scored a mean of 80.90 (2.77) ±15.15 (58% of reference scale). This means predisposing factors in medication adherence and appointment keeping was at average level. Conscious Awareness and Knowledge about HIV Infectivity and Treatment Outcomes measured on a 11-point reference scale revealed that participants had a mean score of 8.53 (0.25) ±1.38 representing 77% of the maximum score. This showed that the level of **Conscious** Awareness and Knowledge about HIV Infectivity and Treatment Outcomes reported as received by PLWHA were high for this group.

Perceptions about HIV treatment was considered as 35 items on 105-point scale and involved five sub-variables of perception of confidence, usefulness and applicability of health counsel and messages delivered to PLWHAs in clinics; perceived benefits, perceived threats, perceived barriers and perceived self-efficacy about HIV medication Adherence skills. Results showed that the level of perception reported a mean score of 59.73 (2.40) ± 13.16 for Experimental, representing 56.8% of the reference scale. This showed that the level of Perception about HIV was generally above average levels. Attitude was measured using 7 items on a maximum reference scale of 21-points. Respondents reported the level of Attitudinal Disposition giving a mean score of 12.63 (0.54) ± 2.98 being 60% of the reference scale. This showed that respondents' Attitudinal Disposition was above average level.

Table 4.2 Measures of Predisposing Factors involved in Medication Adherence in HIV/AIDS Treatment.

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VARIABLES	Reference Scale	***N=120	
		$\overline{X}(SE)$	±SD
PREDISPOSING FACTORS	137	80.90(2.77)	15.15
Conscious Awareness and Knowledge about HIV and Treatment	11	8.53(0.25)	1.38
Information Adequacy about HIV Treatment	6	4.87(0.20)	1.11
Knowledge about HIV	5	3.67(0.18)	0.99
Perceptions about HIV Treatment	105	59.73(2.40)	13.16
Perceived Confidence about usefulness of information received	27	19.50(0.92)	5.06
Perceive Benefits	18	6.80(0.39)	2.12
Perceived Threat	30	14.00(0.75)	4.09
Perceived Barriers	15	8.67(0.47)	2.56
Perceived Self-Efficacy	15	10.77(0.46)	2.56
Attitudinal Disposition	21	12.63(0.54)	2.98

****Respondents in this study*

4.2.2 Reinforcing, Enabling Factors and Self-Reported Medication-Adherence in ART Medication involved in HIV/AIDS Treatment in this study

In this study, Reinforcing Factors in ART Medication were considered as 5 items measured on 15 points scale. Results showed that respondents reported a mean score of 8.87 (0.47) ± 2.50 for Experimental group. This represents 59% of the reference scale showing that the levels of Reinforcing Factors in ART Medication are above average. Enabling Factors in ART Medication, on a maximum scale of 15 reported a mean score of 8.00 (0.51) ± 2.77 (53.3% of the reference scale). This showed that the level of Enabling Factors in ART Medication *is* at average level. Self-Reported Adherence with maximum score of 24 points reported a mean score of 15.98 (0.57) ± 4.39 representing 66.6% of the reference scale for experimental group. This revealed that the Adherence to HIV-Information and Medication instructions, including appointment keeping is at intermediate levels (above average) for experimental group at baseline.

Table 4.3: Measures of Reinforcing, Enabling factors and Self-Reported Medication Adherence in HIV/AIDS Treatment at Baseline for Control and Experimental.

VARIABLES	Reference Scale	***N=120	
		$\overline{X}$ (SE)	±SD

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Reinforcing Factors	15	8.87(0.69)	3.78
Enabling Factors	15	8.00(0.51)	2.77
Self-Reported Medication-Adherence and Appointment- keeping (SRMA)	24	17.87(0.91)	4.99

****Respondents in this study*

DISCUSSION OF RESULTS

5.0 Introduction

The aim of this study was to assess the level of HIV-Medication Adherence amongst PLWHA Clinic Attendees in Jalingo and Ardokola Districts of Taraba State. The constructs of the precede model was used to explain specific behavior that are likely Adherence predictors. Four specific objectives that guided the study were achieved and includes, to:
The specific objectives that guided the study includes, to:

1. Determine the level of Predisposing Factors involved in Medication Adherence and Appointment Keeping in HIV/AIDS Treatment in this study
2. Determine the level of Reinforcing factors involved in Medication Adherence and Appointment Keeping in HIV/AIDS Treatment in this study
3. Determine the level of Enabling Factors involved in Medication Adherence and Appointment Keeping in HIV/AIDS Treatment in this study
4. Determine the level of Self-Reported Medication-Adherence in ART Medication in this study

The discussion is based on Research Questions and the implications for the answers are also commented on. However, the demographic characteristics of the respondents are presented first.

5.1 The Demographic Characteristics of Respondents in this study

Results showed that a wide range of age categories were represented in the study. This corresponds to the Federal Ministry of Health (2015) who reported the national prevalence rate in 2015 among people aged 15-49. Majority of the respondents were those of age categories, 18 to 40 years who have reached ages of accountability and now holds responsibilities for themselves and for other dependents under them. More of the participants were also of Females gender (66.7%); most of whom even though were 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% are non-formal and primary holders) and their perceived sub-servient social status is felt to account for a larger infection rate amongst them.
The Mumuye ethnic group (28.3%) being majority of the respondents was felt to be due to their culturally high social lifestyle of high vulnerability. It could also be due to the subsidy program Taraba

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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 because 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).

5.2 Research Question 1: What is the level of Predisposing Factors involved in Medication Adherence and Appointment Keeping in HIV/AIDS Treatment in this study?

Predisposing factors are important determinants in medication adherence and possesses the potentials to improve adherence behaviors (Green, 1999). In this study, the level of predisposing factors in HIV-Medication Adherence and appointment keeping was ranging from low to average levels and may be responsible for the continual sub-optimal adherence and treatment failures following the usual traditional and conventional intervention strategies. These factors where considered as given by Green in terms of level of **Conscious** Awareness and Knowledge about HIV Infectivity and Treatment Outcomes reported as received by PLWHA at the Clinics. The findings of Thailand Ministry of Public Health (2000), who reported that inadequate information from their counselors reaches the clients is similar to findings of this study where knowledge and awareness about treatment regimens become inadequate in many routine clinics, thereby resulting in suboptimal adherence. The level of Perception about HIV was generally above average levels. Perception of Confidence, Usefulness and Applicability of Health Counsel and Messages Delivered to PLWHA in Clinics, Perception of benefit of Health Counsel and Messages Delivered to PLWHA in Clinics, Perceived threats, Self-Efficacy involved in HIV treatment and Attitudinal Disposition were all ranging from low to average levels. Findings in this study are in line with a study by Gibson, Mary, Esther, Andrew, Amos, mani, Godfather, Chacha, Doris, and Godlisten (2018) who reported that respondents were found to have low level of predisposing factors such as knowledge on the risk factors, prevention strategies and their associated complications, perceptions and attitudes.

Research Question 2: What is the level of Reinforcing factors involved in Medication Adherence and Appointment Keeping in HIV/AIDS Treatment in this study

The level of Reinforcing Factors in ART Medication was found to be above average. A similar study reported by Dizaji, Rastgarimehr, Shafieyan, Mansourian, Hoseini, Arzaghi, Qorbani, Rezapoor, Asayesh, Charkazi, and Ansari (2015) on the level of Reinforcing and Enabling Factors in ART Medication reported similar results with this study, with increased mean scores for reinforcing and enabling factors in health behaviours.

Research Question 3: What is the level of Enabling Factors involved in Medication Adherence and Appointment Keeping in HIV/AIDS Treatment in this study

The level of Enabling Factors in ART Medication *is* at average level. A similar study reported by Dizaji, Rastgarimehr, Shafieyan, Mansourian, Hoseini, Arzaghi, Qorbani, Rezapoor, Asayesh, Charkazi, and Ansari (2015) on the level of Reinforcing and Enabling Factors in ART Medication reported similar results with this study, with increased mean scores for reinforcing and enabling factors in health behaviours.

Research Question 4: What is the level of Medication Adherence and Appointment keeping amongst respondents in this study?

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Adherence to HIV-Information and Medication instructions, including appointment keeping is at intermediate levels (above average). However, the Adherence prevalence rate for this group was found to be 74%, a suboptimal rate. This contradicts the arguments of Ho, Bryson, and Rumsfeld (2009) and McKenney, Munroe, and Wright, Jr (1992) that for best outcome from ARVs, the standard medication adherence should be not less than 95% of the prescription. Similarly, research work done at rivers southern Nigeria in 2016 revealed 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). All these improvements still fall short of the recommended standard cut off of ≥ 95% (Suleiman and Momo. 2016, Ho, et al, 2009 and McKenney, et al, 1992).

5.3 Conclusion

This study revealed that Adherence to HIV treatment is suboptimal from the recommended rate of 95%. It is therefore, recommended that strategically targeted theory-grounded intervention programs should be inculcated in all HIV programs so as to improve Adherence, reduce infection, and improve quality of life of PLWHAs.

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