Influence of Education and Pattern of Daily Feeding on Treatment Adherence in People Living with HIV and AIDS.

ATIBIOKE, O.P (PhD)
Programme Manager, Association for Reproductive and Family Health (ARFH)
Millennium Builder's Plaza, Plot 251 Herbert Macaulay Way,
Central Business District, Abuja, Nigeria
Email: yemitibioke@yahoo.com
Tel: +2348035792603

OSINOWO, H.O
Professor and Former Head
Department of Psychology, Faculty of the Social Sciences, University of Ibadan

TAIWO, ABIGAIL O (PhD)
Institue of Human Sciences, Faculty of Education, Health and Wellbeing,
Univerity of Wolverhampton, United Kingdom
a.taiwo@wlv.ac.uk

Abstract

The clinical efficacy of antiretroviral therapy (ART) in suppressing the HIV and improving survival rates for those living with HIV has been well-documented. However, despite the efficacy and the improvement in prognosis of those living with HIV/AIDS, a large proportion of individuals on ART do not achieve adequate biological suppression. In order to explore some of the socio economic factors that influence adherence, a cross-sectional study was conducted among PLHIV receiving care and treatment in University College Hospital, Ibadan, Nigeria. Participants were randomly selected from low socio economic status identify through initial screening of their socio-economic status and have been on treatment for average of four years. A structured questionnaire with 78 items was administered to 548 participants who met the inclusion criteria. The results revealed that people living with HIV and AIDS who possess no education or pre-secondary education would report significantly good adherence compared to those that possess post-secondary education ($\chi^2 = 23.448$: $P < 0.05$). The research also revealed that number of daily feeding significantly influenced adherence to treatment in people living with HIV & AIDS ($\chi^2 = 40.026$: $P < 0.05$). In conclusion, educational level and pattern of daily feeding have significant influence on level of adherence to treatment among PLHIV. Service providers should therefore provide more adherence support to clients with higher educational status and provision of financial support to indigent clients on ART should not be ruled out at least to meet their basic feeding needs.

Keywords: *HIV/AIDS, Adherence, Clinical Efficacy, Biological Suppression, Educational Level, Pattern of Daily Feeding.*

Introduction

The clinical efficacy of antiretroviral therapy (ART) in suppressing the HIV virus and improving survival rates for those living with HIV has been well-documented (Kredo et al, Lohse et.al and Vergidis et.al).

However, successful antiretroviral therapy is dependent on sustaining high levels of adherence (correct dosage, taken on time, and in the correct way—either with or without food) especially in attaining 95% benchmark required for antiretroviral drugs efficacy (Lima et.al, 2008). Despite the efficacy of combination antiretroviral therapy however and the improvement in prognosis of those living with HIV/AIDS, a large proportion of individuals on ART do not achieve or maintain adequate biological suppression. Several factors play important roles in achieving optimum viral suppression in PLHIV in which adherence to HIV treatment plays important roles. The latest data from 23 countries indicate that the average retention rates for people on ART decreases over time, from about 86% at 12 months to 82% at 24 months and 72% at 60 months (Global Update, 2013) with considerable variation between countries. Common barriers to adherence include medication side-effects, pill burden, the need to disclose HIV serostatus, a perception of feeling well, treatment fatigue and structural and psychosocial factors (Mills et.al, 2006). For individuals, nonadherence can result in virological treatment failure, the development of drug resistance, disease progression and death (Bangsberg, 2011, Nachega, et.al, 2010 and Baggaley et.al, 2013). At the community level, nonadherence makes HIV transmission more likely, (Cohen et.al 2011 & Nachega, 2010), which can substantially increase health-care costs, particularly for hospitalization to treat opportunistic infection and can decrease productivity (Liu, et.al. 2004). Additional research to understand the roles socioeconomic factors play on adherence to antiretroviral therapy (ART) among patients in Nigeria is therefore necessary which is what the current research focused on.

The Federal government of Nigeria introduced the national ART programme in 2002 and under the programme couple of thousands of adults and children were given access ARV drugs. The price of the drugs was heavily subsided by the government with help from several donor agencies. In 2004, the programme experienced some supply challenges. In 2006, another program was started with the goal of providing ARV drugs at no cost to about 250,000 HIV-positive patients. Although a total of 74 treatment sites were participating in this program by the end of 2006, only about 15% of PLWHA needing ARV drugs in Nigeria had access to this treatment (Monjok et al., 2010). WHO reports has made it clear that expanded access to ART can reduce the HIV transmission at population level, significantly reduce orphan-hood help in preserving families. In 2010, WHO and UNAIDS launched the Treatment 2.0 strategy, which promotes radical simplification of ART, with accelerated treatment scale-up and full integration with prevention, in order to reach Universal Access. WHO launched in July 2013 new guidelines with recommendations on ART for adults and adolescents. All these will make sure that more PLWH have access to the ART and their lives could be better as the disease is kept at bay. With ART, a patient has a great chance at a long life deprived of complications of HIV if factors related to retention in care and adherence are properly managed. These will however be an exercise in futility if the clients placed on ART fail to maintain minimum adherence (95%) to achieve maximum benefits from HIV treatment.

Problem Statement

Poor adherence has been the primary reason for suboptimal clinical benefit in HIV management for a very long time. (Dunbar-Jacob, 2000; Rybacki, 2002). It causes medical and psychosocial complications of disease, reduces patients' quality of life, and wastes health care resources. In the University College Hospital Ibadan where the study was conducted, an average of 3,000 clients default from treatment annually due to various reasons which ranged from forgetfulness, financial problems, lack of social support, job schedules especially travelling out of location beyond the estimated time for official assignments, reaction to drug regimen (side-effects), using other traditional healing methods (such as taking herbs) and misplacement of appointment cards. Taken together, these direct consequences impair the ability of health care systems around the world to achieve population health goals. Furthermore, failure to adhere to prescribed regimens results in low drug potency, which can quickly render these combinations ineffective, because of rapid and irreversible selection of genetic variants with decreased drug susceptibility (Matchinger & Bangsberg, 2005). The impact of poor adherence is heightened by the fact that these variants are resistant to other drugs of the same class, and the limited number of drugs available are rapidly exhausted by cross-resistant variants, resulting in renewed HIV replication and immune destruction. Adherence rates approaching 95% are needed for optimal viral suppression (Gifford, 2000; Matchtinger & Bangsberg, 2005). Suboptimal adherence to ART is responsible for increase in AIDS-related morbidity and

mortality as explained above. A significant proportion of all hospital admissions of people living with HIV and AIDS are due to treatment non-adherence (Paterson, 2000). Many times, most HIV positive persons on hospital admission beds are there as a result of their failure to take medication or follow treatment instruction as directed. Quite unfortunately, many of them do not recover from these consequences. HIV treatment nonadherence not only affects the health of individuals, but it also impacts households by tasking their few resources and increase their stress level, which would not have been necessary if their HIV - positive family member adhered strictly to their treatment regimen.

Communities also have their own share of the effect of poor adherence to treatment. Many community members who would have contributed to the development of the community are either dead or rendered inactive, owing to lack of adherence to HIV treatment. The development and economic growth of a nation may be severely affected as a result of HIV infection and poor adherence, coupled with the facts that many of the countries hardest hit by HIV also suffer from other infectious diseases, food insecurity, and other serious problems. The precarious nature of the epidemic and its negative impact include higher dependency ratio, reduction in GDP growth and productivity rate, increasing poverty, rising infant and child mortality as well as growing numbers of orphans resulting from the death of parents. Most of these could have been averted if good adherence to treatment regimen was observed (Cramer, Rosenheck, Kirk, Krol and Krystal, 2003).

Other problems associated with adherence include; lack of disclosure within families; women often fear a partner's violent reaction, and men often do not want to change their lifestyle. Both women and men may take medication in secret or not take it at all depending on the situation around them. Lack of HIV testing, particularly for positive men, is also a problem militating against adherence. HIV-positive men often take their partners' medication rather than undergoing an HIV test and receiving their own ARVs. Till now, most people who know that they might be HIV positive do not bother about seeking health by knowing their HIV status which is the entry point for any form of adherence except if death is knocking. Cultural roles and expectations is another big problem in HIV treatment adherence especially for women. Women are overburdened and overworked which affects their ability to adhere to treatment protocols. In particular, to ensure confidentiality, some patients may travel long distances to access treatment and if they cannot afford the cost of transportation, their adherence to treatment especially the timing of their drug pick up may be affected (Gifford, 2000). Also, sometimes patients' drinking affects their ability to remember to take ARVs. Drinking may also interfere with timing of doses and may encourage other high-risk behaviours (Gifford 2000). Most PLHIV also lack treatment literacy, combined with cultural practices that hinder men from certain practices such as visiting hospitals frequently, which affects their ability to adhere to treatment. Men may focus more on supporting their families than on ensuring their own health. Unarguably, HIV and AIDS constitute a leading development challenge and a major threat to the general advancement of many African nations as well as the capacity to achieve the Sustainable Development Goals (MDGs). Competing needs in populations suffering from chronic poverty undermine efforts to address the needs of patients requiring long-term care, including the problem of adherence to medications and therapies. Poor adherence compounds the challenges of improving health in poor populations, and results in waste and underutilization of already limited treatment resources.

To achieve effective treatment and realize the benefits of treatment, strict adherence to treatment instructions are very critical. Just having medicine available cannot solve the HIV and AIDS problems, concerted effort have to be made to stay adherent, especially if the consequences of nonadherence is weighed. Nonadherence may eventually undermine the dramatic improvements in HIV-related health parameters seen in resource-rich countries and expected in developing countries as ART becomes more widely available. The final crucial step toward ameliorating the impact of HIV- the actual taking of the medications is to explore the social economic factors that influence adherence with the aim of providing timely and effective intervention. This is the key aim of this study.

Hypotheses

Two hypotheses were tested in this publication

1. People living with HIV and AIDS who possess Post-Secondary Education would report significantly good adherence to treatment compared to those who possess no education or pre-secondary education.
2. People living with HIV and AIDS who eat minimum of three times daily would report significantly good adherence to treatment compared to those who eat less than three times daily.

Methodology

The study adopted cross-sectional survey research design. The independent variables were; socio economic status such as educational level, pattern of daily feeding and demographic factors such as; age, sex, and marital status. These variables are considered important in that previous researches have concentrated more on the influence of other variables with few attention of influence of educational level and access to regular feeding on treatment adherence among people living with HIV/AIDS. The dependent variable for this study is treatment adherence in PLHIV.

Study Setting

The setting for this research was President's Emergency Plan for AIDS Relief (PEPFAR) unit, University College Hospital, Ibadan, South-West, Nigeria. This is a tertiary health institution where comprehensive ART programme is being implemented. The clinic caters for an average of 320 clients daily from Monday to Thursday out of which an average of 210 clients visit for drug pick up in particular. As at the time of conducting this research in 2013, 10,641 clients were on ART comprising 10,096 adults and 545 children. Of this figure, 3669 are males (3379 adults and 290 children) while 6972 females (6,717 adults and 255 children). Due to the comprehensive nature of the facility, all HIV services are provided which include: Prevention services, HIV Counselling and Testing, PMTCT, adult care and treatment, pediatric care and treatment, OVC, laboratory services, injection safety, blood safety, reproductive health services and HIV/TB co-management. This setting was considered appropriate for this study because of its comprehensive nature and most of its clients come from various cities in the western region in particular to receive treatment and care. The ethical approval for this study was secured from UI/UCH Ethics Committee on 3rd, January, 2012

Participants

The population for this study was selected from PLHIV receiving Anti-Retroviral Therapy (ART) in President's Emergency Plan for AIDS Relief (PEPFAR) Clinic, University College Hospital (UCH) Ibadan. Participants were drawn from those who had been using drugs for not less than six months prior to the study. Most of the participants are from low socio economic status and have been on treatment for average of four years. A structured questionnaire with 78 items some of which were developed or adapted but revalidated was administered to 600 participants who met the inclusion criteria. However, only data for 548 participants, comprising 154 males (28.1%) and 394 females (71.9%) were analysed. Others were excluded because of incomplete information. The mean age of participations was 39.5. Detailed analysis of participants' characteristics is found in the result section.

Instruments

The researcher used existing scales which were revalidated while some were developed from the outcomes of the various desk reviews and focused groups discussions conducted at the pilot stage. Additionally, some questions were adapted from existing scales in the development of the questionnaire. The various scales were properly pilot tested and validated before they were administered for the main study. The scale was divided into two major sections. The first section measured Socio-demographic variables, while the second

section measured both the independent and the dependent variables. In all, there were 78 items which were translated to Yoruba - a major local language spoken in Ibadan - the study area. The translation was derived by the iterative back-translation method.

Procedure

Participants for this study were randomly selected from the study population through systematic random sampling technique. The medical records staff were contacted and detail information on the research was shared with them. According to head of the unit, an average of 320 people visit the clinic daily out of which 210 come specifically to refill their drugs. Those who come for drug refill were of interest for the research. The record of every client that visits the clinic per day is captured by the medical record which is used to pull their files. The record was used for the random selection of participants. To be able to recruit the number of participants for this study within 28 days which makes a complete cycle for every client to return for their refill, an average of 21 participants were recruited per day. Since there was average of 210 clients per day, every client that falls into every 10^{th} was selected for this study provided they meet the inclusion criteria and was willing to participate. All the clients who turn up daily for appointments were informed about the research during the health talk while the study lasted. This provided opportunity for establishing a very cordial relationship with the participants.

Statistical Analysis

Chi square and logistic regression statistical tool were used for data analysis and findings were calculated at 0.05 confidence level

Results

Hypothesis One

People living with HIV and AIDS who possess post-secondary education would report significantly good adherence to treatment compared to those who possess no education or pre-secondary education.

Table 1: Cross Tabulation for Educational Level and Adherence

Variable	Good Adherence	Poor Adherence	Total
No Education	24 (75.0%)	8 (25.0%)	32 (100.0%)
Primary Education	98 (88.3%)	13 (11.7%)	111 (100.0%)
Secondary Education	184 (77.6%)	53 (22.4%)	237 (100.0%)
NCE/ND	60 (71.4%)	24 (28.6%)	84 (100.0%)
BSC/HND	47 (67.1%)	23 (32.9%)	70 (100.0%)
Others	8 (72.7%)	3 (27.3%)	11 (100.0%)
Total	**421 (76.8%)**	**127 (23.2%)**	**548 (100%)**

(X^2= 23.448: P < 0.05)

Hypothesis one, which states that people living with HIV and AIDS who possess post-secondary education would report significantly good adherence to treatment compared to those who possess no education or pre-secondary education, is not supported by the results. The alternative hypothesis which states that people living with HIV and AIDS who possess no education or pre-secondary education would report significantly

good adherence compared to those that possess post-secondary education is therefore accepted (χ^2= 23.448: P < 0.05). Table 1 reveals that those with lower level of education adhered to treatment more than those with higher level of education. For instance, 88.3 % of the patients with primary education adhered to treatment while only 67% of those with HND or B.Sc. adhered to treatment.

Hypothesis Two

People living with HIV and AIDS who eat minimum of three times daily would report significantly good adherence to treatment compared to those who eat less than three times daily.

Table 2: Cross-Tabulation for Pattern of Daily Feeding and Adherence

Variable	Good Adherence	Poor Adherence	Total
Six times daily	15 (100%)	0 (0.0%)	15 (100%)
Five times daily	37 (92.5%)	3 (7.5%)	4 (100%)
Four times daily	89 (87.3%)	13 (12.7%)	102 (100%)
Three times daily	243 (73.6%)	87 (26.4%)	330 (100.0%)
Two times daily	33 (71.7%)	13 (28.3%)	46 (100.0%)
Once daily	4 (26.7%)	11 (73.3%)	15 (100.0%)
Total	**421 (76.8%)**	**127 (23.2)**	**548 (100%)**

(X^2= 40.026: P <0.05)

Hypothesis two which averred that people living with HIV and AIDS who eat minimum of three times daily would report significantly good adherence to treatment compared to those who eat less than three times daily, is supported by the results shown above (χ^2= 40.026: P < 0.05). The cross-tabulation matrix in Table 2 reveals that there was progressive improvement in adherence to treatment as the number of daily feeding increased. Only 26.7% of those who ate once daily had good adherence while 71.7%, 73.6%, 87.3%, 92.5% and 100% of those who ate, two times daily, three times daily, four times daily, five times daily and six times daily, had good adherence respectively. It could be strongly inferred that the number of daily feeding significantly influences adherence to treatment in people living with HIV & AIDS.

The findings were subjected to Logistic Regression analysis and the results are presented below:

Educational Level: The result in Table 3 above revealed that those with primary education were 175% more likely to adhere to medication than those with higher education, (Above secondary education). Those with primary education were 2.75 times more likely to have good adherence than those with higher educational qualification (OR= 2.75, CI=1.31-5.75).

Pattern of daily feeding: Table 3 also shows that, those that ate only once daily were less likely to have good adherence than those who ate three or more times daily (OR=0.04, CI = 0.01-0.18). Those who ate only once daily were 96% less likely to have good adherence compared with those that ate three or more times daily.

Table 3: Logistic Regression Analysis of Factors Influencing Adherence in people living with HIV & AIDS

Variable	B-Coefficient	P-Value	Adjusted OR	95% Confidence Interval for OR adjusted	
				Lower	Upper
Education Higher(Ref.)					
No Education	.228	.652	1.256	.466	3.384
Primary Education	1.010	.007	2.746	1.312	5.748
Secondary Education	.381	.139	1.464	.883	2.426
Feeding Three times daily (Ref)					
One time daily	-3.152	.000	.043	.010	.182
Two times daily	.255	.522	1.291	.591	2.821

Discussion

The outcomes of the research revealed that educational level and pattern of daily feeding have significant influence on level of adherence to treatment among PLHIV. From the findings, higher level of education and lack of access to regular daily feeding may serve as barriers toward complete adherence to treatment in PLHIV. The study revealed that those with lower level of education adhered more to medication than those with higher level of education. A total of 88.3 % of the patients with primary education adhered to treatment while only 67% of those with HND or BSc adhered to treatment. It is common to find people who are not educated conforming absolutely to instructions as provided by the health care providers the moment they understand such instructions.

This is in agreement with the report of World Bank (1993, 1999) which found that adults who died from AIDS are more educated which is a reversal of the normal relation between education and health. Also, it is obvious from the study that there is significant improvement in treatment adherence in PLHIV if they have access to regular daily feeding. Progressive improvement was found in adherence to treatment as the number of daily feeding increased. As evident in the findings, only 26.7% of those who ate once daily had good adherence; 71.7%, 73.6%, 87.3%, 92.5% and 100% of those who ate two times daily, three times daily, four times daily, five times daily and six times daily, respectively had good adherence. Eating is a strong factor that determined by the economic power of individuals.

This is in agreement with the study conducted in Uganda by Weiser, Tuller, Frongillo, Senkungu, Mukiibi (2010) among 47 individuals (30 women, 17 men) living with HIV/AIDS recruited from AIDS treatment programs in Mbarara and Kampala, Uganda to understand how food insecurity interferes with ARV therapy regimens. Food insecurity was found as a key barrier to accessing medical care and ARV adherence. Five mechanisms emerged for how food insecurity can contribute to ARV non-adherence and treatment interruptions or to postponing ARV initiation: (1) ARVs increased appetite and led to intolerable hunger in the absence of food;(2) Side effects of ARVs were exacerbated in the absence of food; (3) Participants believed they should skip doses or not start on ARVs at all if they could not afford the added nutritional burden; (4) Competing demands between costs of food and medical expenses led people either to default from treatment, or to give up food and wages to get medications and (5) While working for food for long days in the fields, participants sometimes forgot medication doses. They concluded by expressing concerns about the sustainability of adherence to ARV in the presence of widespread poverty and food insecurity. This is in alliance Katabira, (2002) who found that poor socioeconomic status was associated with poor adherence with treatment, independent of long-term illness, educational level, living alone, risky lifestyle profile and trust in health care.

Conclusion

From this study, it could be concluded that educational level and pattern of daily feeding have significant influence on level of adherence to treatment among PLHIV. It has become necessary for service providers to pay more attention to providing medication adherence to all PLHIV on treatment with more frequent support for those with higher educational status. Also, provision of support to those living with HIV especially those that are indigent to the point of not being able to access at least three square meals should be a major consideration in HIV Programme implementation. Although, there have been a lot of opinions that continuous provision of hand out (Food in this instance) should be discouraged in HIV programming, the findings from this study is obviously recommending that support for indigent individuals on HIV treatment will make significant positive impact in their adherence behaviour. The multiplier effects adherence to treatment would have including having heathier population, improved treatment outcomes and lesser fatality from HIV makes it a key factor to consider in HIV programming

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