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ORIGINAL ARTICLE

The Role of HIV-Knowledge and Sexual Risky Behaviour on Medication Adherence Among People Living With HIV.

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Abstract: A total of 578 respondents participated in this study which investigated the influence of HIV-knowledge and sexual risky behaviour on medication adherence among HIV patients in Benue State, North-Central Nigeria. Permissions were requested from and granted by concerned authorities. **HIV-KQ-18**, **SRBS** and **MARS** were used to conveniently sample participants in a cross-sectional survey. Standard multiple regression was adopted to test statistical significance of the data on SPSS version 21. The results showed a significant positive relationship between HIV-knowledge and medication adherence (r=.216, p<.05), whereas sexual risky behaviour has a significant but negative relationship with medication adherence (r= -.274, p<.05). Data showed that HIV-knowledge and risky sexual behaviour are significant predictors of medication adherence among HIV patients ($F_{2, 575}$=44.47, P< .001). It was also found that sexual risky behaviour significantly predicted medication adherence (β = -.30, t=7.60 P<.001), as did HIV-knowledge (β = .24, t=6.23, P<.01). Findings were discussed and suggestions made.

Keywords HIV-Knowledge, Sexual Risky Behaviour, Medication Adherence, Benue State

INTRODUCTION

Despite the numerous free HIV testing and counseling centre in Nigeria, most people infected with HIV are oblivious of their status, making prevention and control difficult (Slaymaker, Walker, Zaba, & Collumbien, 2003). Mercer (2010) reported the UNAIDS/WHO records that the number of people living with HIV worldwide continues to grow, with estimated 20% increase from year 2000 to 2008. Following prediction of HIV/AIDS steady growth, international and national institutions coordinated by national agency for the control of AIDS (NACA) in Nigeria was established to tackle and nip the rising tide of this disease, which brought about HIV testing and counseling aimed at stemming risky sexual behaviors and provision of treatment regimen (Ucho & Anhange, 2013).

Slaymaker, Walker, Zaba, and Collumbien (2003) have categorized sex as either safe or unsafe if something is known about the context in which it takes place and with whom. Having sex does not place a person at risk of contracting a disease unless that person's partner has an infection, which they can transmit. Therefore, unlike many other risk factors, which are independent of the situation in the broader population, or with respect to other individuals, unsafe sex cannot be uniquely defined by the set of actions of an at-risk individual. Rather, a definition must be based on an analysis of the individual's actions in light of the background prevalence of disease2. The proportion of people infected with HIV in the population is the main factor influencing the probability of having sex with somebody who is infectious for HIV. Simply put, unsafe sex occurs if a susceptible person has sex with at least one partner who has an STI, without taking measures to prevent infection (World Health Organisation (WHO), 2010; Slaymaker, Walker, Zaba, & Collumbien, 2003).

Slaymaker, et.al (2003) states that people who engage in risky sexual behaviours exhibit acts which may vary in situations but primarily includes having many sexual partners and not using condoms properly. They argue that although infected persons may be at risk but the risk is more on the susceptible people who are not yet infected because the infectious agent has not been transmitted or the infection has not yet been established. Therefore, people engaging in hazardous sex are susceptible persons who either engage in unprotected sex with uninfected partners or who have had sex with at least one partner who has an STI taking measures to prevent transmission. These people have the potential to be exposed to infection, either by encountering an infected partner, or if measures taken to prevent transmission are ineffective (such as condom failure).

Scientific research reports (International AIDS society, 2014; WHO, 2010) clearly demonstrates the clinical benefits of earlier initiation of antiretroviral treatment (ART), as ART can greatly reduce tendency of HIV transmission. The new recommendations that be initiated on new patient irrespective of the CD4 level increased the number of people eligible for ART globally in 2010. Although CD4 counts were used as criterion for enrollment into ART but the focus has changed to viral load test (conducted after first 6months, second 6months and annually after commencement of ART) which is an indication of early enrollment to ART and good adherence to medication (Society For

Family Health (SFH), 2018). There have been issues bordering on the exaggerated and inflated figures for the number of people living with HIV reported in Nigeria.

The people living with HIV globally in 2018 is estimated at 37.9 million while those accessing ART are 23.3 million, Western and Central Africa has 5 million infected people while 2.6 million of which are accessing ART (UNAIDS, 2019). The International AIDS Society (2014) emphasized that preventive benefits of treatment must not be used as a pretext for failure to provide other necessary HIV programming for key populations, such as comprehensive harm reduction and other prevention interventions tailored to meet the needs of various target population which include transgender people, people who inject drugs, commercial sex workers, men who have sex with men or the mother-to-child transmission. One of the recommendations from the report states that, initiation of ART in all people in serodiscordant relationships reduces the risk of HIV transmission to the HIV negative partner among key target population all over the world.

Knowledge comes from accessing inform and the greatest avenue for obtaining HIV/AIDS related knowledge is at counseling and testing centre, HIV support group meetings, followed by print and electronic publications. HIV counseling and testing have yielded gainful results in reduction of death among people living with the disease, it is expected that similar trend would have been obtained in the area of transmission. Ucho and Anhange (2013) listed numerous benefits of voluntary testing and counseling, among which includes; it serve of entry point into medical system, provide sources for management of HIV/AIDS and opportunistic infections, gives information on serostatus, provides health promoting information to discourage sexual risky behaviors of the uninfected persons and discordant couples or even the infected persons.

The SFH (2018) states that the HIV One-Stop-shop (OSS) programme is also an avenue for accessing all information, testing and immediate referral for enrollment on the ART scheme because a lot of community based organizations (CBOs) are employed to strengthen the campaign. It is therefore very necessary for people to avail themselves to acquire HIV/AIDS knowledge so as to liberate them from false and myth beliefs, hence informing them of the best strategies of avoiding possible exposure to HIV infection. Knowledge on HIV/AIDS demystifies false beliefs and myths, also goes a long way in drastically reducing stigmatization tendencies among serodiscordants by demonstrating that HIV positive status is not a death sentence but a journey that requires to be traveled with cautious commitment (Awofala & Ogundele, 2018).

Interaction of the researchers with HIV patients and peer educators reveals that the fear of stigmatization has made a lot of infected people unable to reveal their HIV status to their sexual partner (people who they have had sex with either just once, a few times, as regular partners or as married partners). This secrecy of serostatus makes the naïve HIV negative partner relaxed, very free and at ease to engage in sexual risky behavior (not using condoms and engage in oral sex) with the HIV positive partner who concealed their HIV status out of fear of abandonment. Lawal (2013) opines that risky sexual behaviour is the most prominent factor responsible for the spread of sexually transmitted diseases, making interventionists use sexual risk behaviour assessment to guide risk reduction or prevention programs and provide feedback whether individuals are at the risk of infection of HIV or not. This is also considered to ascertain the effectiveness of any intervention

programs adopted to change sexual risk behavior among individuals. This invariably means that no matter the level of information and treatment gotten after counseling and testing, lowed risky sexual behaviour and medication adherence are keys to preventing newer infections and getting the best from treatments been accessed. Sexual risky behaviour is said to be originating from sexual compulsivity which increase risks for sexually transmitted infections (STIs), including HIV. What remains as the best method to reduce HIV and other STI risk among sexually active persons is the correct and consistent use of condom.

The national strategic frameworks laid by the NACA (2019) outlined key targets, to provide 90% of the general population with HIV prevention interventions by 2021 and for 90% of key populations to be adopting HIV risk reduction behaviors by 2021. They identified strengthening community structures as being a main way to achieve this because stigma and discrimination from health care workers keep away Key Populations from accessing health care services (SFH, 2018). However, some individuals have reported dissatisfaction as barriers in the use of condom (Lawal, 2013; Ucho & Anhange, 2013).

Fores (2018) opine that ignorance and illiteracy are evidence of poor HIV knowledge. Most people are fully aware of the disease, but they continue to get involved in practices that fuel its transmission. This is ignorance, and it is adversely driving the HIV/AIDS epidemic in the whole world, not just the developing countries. Recently, an international media house reported that many Africans do not care about protecting themselves from the infection. HIV transmission can be prevented by condoms, but many people are reluctant to use them even when getting intimate with new partners. Whereas, the illiterate people don't know anything about the HIV transmission ways and preventative measures, and they continue to engage in unsafe practices that spread the virus. These people are also easily influenced by the beliefs, myths, and misconceptions about the disease.

Among HIV population, despite the level of awareness information and treatment procedures administered, the spread of this disease cannot be contained unless patients religiously adheres to medication (Nguyen, La-Casez, & Conttrel, 2016). Medication adherence has been identified as one of the most cost effective and achievable opportunities for improving health outcomes, especially for long-term therapies like HIV/AIDS treatment regimen. Khamisa and Mokgobi (2017) reported that there is an association between risky sexual behavior and HIV infection. Similarly, there is a significant association between inconsistent condom use, which is tantamount to poor adherence to medication and HIV infection.

WHO (2010) asserts that there is a strong scientific evidence supporting the fact that antiretroviral treatment (ART), by lowering a person's viral load and restoring the immune system, significantly reduces HIV transmission and data have shown reduced HIV transmission in serodiscordant heterosexual couples after the introduction of combination ART, and programmatic data support reduction in HIV transmission at the population level (Attia, Egger, Muller, Zwahlen, & Low, 2009). A 2009 meta-analysis including 11 cohorts (5021 heterosexual couples) found zero risk of sexual transmission in patients treated with ART and with viral load below 400 copies per ml (upper confidence limit of 1.27 per 100 years). Attia, Egger, Muller, Zwahlen, & Lo, (2009)

mentioned that a randomized controlled study of HIV-serodiscordant heterosexual couples in Africa found that transmission reduced by at least 90% if the HIV-positive partner is on antiretroviral therapy. The proportion of couples who had unprotected sex actually decreased when the HIV-positive partner started treatment, allaying fears about behaviour change. There is also growing evidence of the impact of ART on community-level HIV transmission (Donnell, 2010).

To Sax, Meyers, Mugavero and Davis (2012), treatment adherence is generally regarded as an important factor in achieving optimal outcomes across many disease states; in the treatment of HIV, poor adherence to treatment has the potential to impact outcomes on multiple levels. Poor adherence to antiretroviral therapy (ART) is associated with less effective viral suppression, which risks the immediate health of the patient, but also risks creating permanent treatment resistance to that particular agent or group of agents within a given combination therapy regimen. Osterberg and Blaschke (2005) opine that this may have downstream effects on treatment costs as well as therapeutic options. The causes of poor adherence to ART are extremely diverse, and include complexity of therapeutic regimens (e.g., pill burden and dosing frequency), treatment side effects, poor health literacy, poor patient-physician relationship, and limited access to ART as a result of formulary restrictions or copayment costs. Treatment approaches such as the use of fixed-dose combinations of ART agents to reduce dosing complexity, as well as educational interventions, such as medication therapy management initiatives have been shown to improve adherence to therapy in HIV. It is important that all members of the healthcare team address potential barriers to adherence to treatment.

Nigeria has a huge HIV/AIDS burden with an estimated 3,459,363 people living with HIV/AIDS in 2013 and an estimated 388,864 new infections occurring in 2011, 240,374 as of 2012, 222,315 as of 2013 (Awofala & Ogundele, 2018), 227,518 in 2014 (NACA, 2015), 240,000 in 2015, 220,000 in 2016 (WHO, 2017), 210000 by 2017 (WHO, 2018) and 130,000 in 2018 (UNAIDS, 2019). Majorly HIV infection come through heterosexual activities and most cases been females (Awofala & Ogundele, 2018). Although, the prevalence of is declining steadily in Nigeria, to assume that the trend cannot go upward will be erroneous conclusion. The SFH (2018) report also showed that some Nigerian States which hitherto had high HIV prevalence like Benue and Akwa-Bom State had made progress but some states which previously were low in prevalence (Ekiti, Oyo, Lagos etc) records have become the trouble spot with the alarming HIV prevalence records been reported about them. This is a bad indicator that the campaign is not yielding an all rounded uniform decline in both states of high and low prevalence cases. (NACA, 2012) shows HIV/AIDS prevalence of the national annual new HIV infections rose from 115,696 in 1990 to 310, 347 in the year 2000 and declined to 245,301 in 2005. There was a spike to 259, 141 in 2007 but a steady decline to 2018 with new infections higher in women than men (NACA, 2012).

The large numbers of new infections pose a serious challenge to national response efforts as it is suggestive of persistent high risk sexual behaviour, low knowledge and inadequate focused interventions (Samuels, Fiona, & Akinrimisi 2012). The statistics provided by NACA (2012) further affirms the position of WHO (2012), that HIV-serodiscordant couples should be informed that ART is also recommended to reduce HIV

transmission to the uninfected partner(s). These data have led to an increasing consensus that people who have achieved and maintained undetectable viral load cannot transmit HIV sexually to their partners (UNIADS, 2018).

The UNAIDS vision 90-90-90 targets that "by 2020, 90% of all people living with HIV will know their HIV status; 90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy and 90% of all people receiving antiretroviral therapy will have viral suppression". This policy suggests that achieving these targets by 2020 will enable the world to end the AIDS epidemic by 2030. Although the number of new HIV infections globally continued to decline in 2017 (UNAIDS, 2018), the rate of the decline does not guarantee the 2020 target of 90-90-90 vision (UNAIDS, 2014) because new HIV infections are not falling fast enough. This results from poor acceptance of condom, tenacious false beliefs that lead to heightened risky sexual behaviours and poor medical adherence. In furtherance of the 99-90-90 target, UNAIDS (2018) made a publication that People living with HIV on antiretroviral therapy who have an undetectable level of HIV in their blood have a negligible risk of transmitting HIV sexually.

However, irrespective of these laudable mediations of voluntary testing and counseling, expanded HIV/AIDS awareness and sensitization campaigns and treatment plan programmes, the UNAIDS (2018) plan that clearly indicates the when viral load is very low and the HIV is undetectable in blood samples, transmission is unlikely. Following the assertion that undetectable is equal to untransmittable (U=U) of UNAIDS (2018), the number of new HIV case is supposed to be moving towards zero, but there have been a continual recording of new cases yearly. What then should have been responsible for this ugly trend? Is it poor HIV/AIDs awareness? Is deliberate engagement in risky behaviors? Or not adhering to treatment regimen? This study therefore seeks to investigate the degree to which HIV/AIDS patients engage in sexual risky behaviours, have HIV knowledge and adheres to medications, since it is established that higher number of HIV infected patients in the society contributes to increased number of new HIV infection cases.

METHOD

Population

The participants in this study were 578 HIV out-patients who access antiretroviral drugs at Bishop Murray Medical Centre High-level, Makurdi, Madonna hospital, Makurdi and St. Gregory hospital Ikpayongo, Gwer-East all in Benue state, Nigeria. They consist of 282 (48.8%) males and 296 (51.2%) females aged between 15-70 years (*M*age = 38.4 years, SD= 10.5).

INSTRUMENTS

Medication Adherence Rating Scale (MARS)

This scale was developed by Thompson, Kulkarni, & Sergejew, (2000) with reliability Cronbach's alpha of 0.75 and validated in Nigeria by Owie, Olotu, & James (2018), yielded reliability Cronbach's alpha: 0.76. MARS 10-item scale has three-dimensional factor structure and has a yes (1point) or no (0 point) response. For questions 1-6 and 9-10, a no response is indicative of adherence and is coded as 1, while for

questions 7 and 8, a yes response is indicative of adherence and is coded as 1. An example is the second question item which asks "Are you careless at times about taking your medication?" Total scores on the MARS may range between 0 and 10, with a higher score indicating better medication adherence.

HIV Knowledge Questionnaire (HIV-KQ-18)

This has 18 items with three response options of true (T), false (F) and I don't know (DK) as was developed by Carey & Schroder (2002). The scale has answer key which aid in providing what the supposed correct answer to each scale should be to connote HIV knowledge of the respondents. The higher the number of correct responses made shows that the respondent has high knowledge on HIV. The scale's internal consistency across samples yielded between .75-89α. The researchers score from 120 participants in a validation study which yielded .83 Crombach alpha. Item three states thus "Pulling out the penis before a man climaxes/cums keeps a woman from getting HIV during sex".

THE SEXUAL RISK BEHAVIOUR SCALE (SRBS)

This is a 6-item instrument developed and validated by Lawal (2013) to assess sexual risk behaviour for STDs, HIV and AIDS prevention. The SRBS taps items falling into sexual risk assessment and event that allow description of the level of risk and those that allow event-level examination of the co-occurrence of potential risk factors with risk behaviour. Item five states that "I did not use condom at my last sex in the last 3 months". Respondents were administered with a scale consisted of 18 statements to indicate "Always", "Sometimes", "Occasionally or "Never" with a corresponding scores of 4, 3, 2 and respectively. Higher score indicates greater reported sexual risk behaviours. Respondents are required to a mark on any response option that best describes their sexual experience during the past three months. The three-month timeframe is well-evidenced in the literature as appropriate to evaluate risk behaviour in sexually active individuals. The SRBS demonstrated internal consistency of alpha=.85.

Procedure

Permission was obtained from hospitals managements to administer questionnaires to outpatients who come to access ART and was granted. Research assistants administered the questionnaires to both literate illiterate patients who willingly agreed to participate. Where a respondent cannot read, the research assistants read each item with their response options and ticked according to that individual response. Participation in the study was voluntary with assurance of privacy guaranteed. A total of 620 questionnaires were distributed but 578 that were well completed and returned were used in data analysis.

Design/Statistics

A cross-sectional survey was employed in this study for data collection and regression was used for data analysis.

Results

Table 1: Inter-variable Correlations using Pearson Product Moment Correlations

Variables	1	2	3	M	SD

Medication Adherence	-			7.395
1.539				
HIV-Knowledge	.216*	-		9.981
3.606				
Sexual Risky Behaviour	-.274*	.090	-	11.294
3.304				

From Table 1 above, results showed a significant positive relationship between HIV-knowledge and medication adherence (r=.216, p<.05), whereas sexual risky behaviour has a significant but negative relationship with medication adherence (r=_.274, p<.05).

Table 2: Summary of Multiply Regression Analysis regarding the influence of HIV-Knowledge and Risky Sexual Behaviour on Medication Adherence

Predictors	R	R^2	F	Sig.	Mean	SD	Beta	t	Sig.
HIV-K					9.981	3.606	.243	6.230	***
	.366	.134	44.354	.000					
SRB					11.294	3.304	-.296	-7.598	***

HIV-K= HIV-Knowledge, SRB=Sexual Risky Behaviour, ***P<.001

The data analysed using standard multiple regression indicated that HIV-knowledge and risky sexual behaviour are significant predictors of medication adherence among HIV patients ($F_{2,575}$=44.47, P< .001). The multiple correlation coefficient was .13, indicating that medication adherence variance is explained by 13% linear combination of HIV-knowledge and risky sexual behaviour. It was found that sexual risky behaviour significantly predicted medication adherence (β = -.30, t=7.60 P<.001), as did HIV-knowledge (β = .24, t=6.23, P<.01).

Considering the standard multiple regression coefficient, HIV-knowledge and sexual risky behaviour predicted medication adherence. Hence the hunch of the researchers that HIV-knowledge and sexual risky behaviour influences medication adherence of seropositive patients was confirmed.

DISCUSSION

The findings of this study indicate that the position of the authors after the review of literatures that HIV-knowledge and sexual risky behaviour are predictors of medication adherence among HIV positive patients. The result showed a negative relationship between sexual risky behaviour and medication adherence, an increase in sexual risky behaviour decreases medication adherence tendency. On the contrary, HIV-knowledge and medication adherence are positively related, as an increase one increases the other and vice-versa.

This study also follows to affirm that one who has sufficient HIV-knowledge will

engage less in sexual risky behaviour and invariably adhere religiously to medication which has proven efficacious enough to keep viral load suppressed (UNIADS, 2018). When viral load is well suppressed, HIV will become undetectable in patients' blood sample, thereby guarantees significantly the untransmittability of the HIV between serodiscordant partners (UNIADS, 2018; Samuel et al., 2012; Sax et al., 2012; Slaymaker, et al, 2004; WHO, 2003).

Evidence from other investigations (NACA, 2017; Fore, 2018; NACA, 2015; WHO, 2012; Donnell, 2010; fisher et al., 2010) shows that this findings further aligns itself with the notion that adequate massive HIV education needs to pursued, including experts counseling of individuals coming for HIV testing, serodiscordant or concordant partners and even at support group meeting to assure everyone that HIV is not a death sentence and that with proper living, following scientific findings, people can live normal lives (Ucho & Anhange, 2013; Attia, et al., 2009).

As risky sexual behaviour has an inverse relationship to medication adherence, the authors found that those who adhere to medication were less likely to engage in sexual risky behaviours elaborated upon by Fores, (2018), Khamisa & Mokgobi (2018), Mecer, (2010) and Slaymaker, et al, 2004. This means that if the at risk engendering persons like those who are HIV positive and are not aware, are not medication or are resistant to medication gets involved in any form risky sexual act with an uninfected person, the transmission of HIV is very certain (Slaymaker, et al, 2004).

This particular study also confirms and gives credence to the assertion that adherence to medication and related practices can indeed prevent HIV transmission (International AIDS society, 2014; WHO, 2010), which guarantees the achievement of the NACA (2018) strategy plan of not recording new HIV infection case by 2030. Medication adherence will truly help attain UNAIDS (2018) vision 90-90-90 and the Undetectable=Untransmittable (U=U) initiation aimed at reducing to the lowest minimum, HIV burden in Nigeria by having 90% HIV patients who are on medication showing suppressed viral load. The implication of this that, as the number of person with suppressed viral load increases, the number of persons who can transmit HIV also reduces, thereby bring number of new HIV infection cases trend moving steadily towards zero (WHO, 2018).

CONCLUSION

Many attempts have been made towards demystifying HIV with the aim of drastically reducing stigma against HIV patients (Samuel, et al., 2012), so that people can summon courage to get tested and when result shows positive reaction, same will be well assured of access to ART. Interaction with patients at some of the centres of data collections revealed that they are aware that sexual risky behaviour is very improper. Some even stated that fear of stigmatization makes I t difficult to inform their partner(s) of their HIV status, leading to not taking (or suspend) ART just to maintain secrecy and keep the relationship. The resultant effect of poor medication adherence is the development of viral drug resistance and/or dangerous rise in the blood viral load. At this stage, any unsafe sex engagement allows for express transmission of HIV to the uninfected partner.

This study therefore, strengthens the already existing intense HIV-knowledge and

awareness which strongly discourages risky sexual behaviour, demystify false beliefs and strongly encouraging medication adherence for suppressed viral loads which is the only guarantee for untransmittablility of HIV to uninfected partner(s) or from mother-to-child. Finally, when we hear that HIV+ status is no death sentence do not imply that infect and uninfected persons alike to get involved in sporadic risky sexual behaviour or be negligent on the key area of medication adherence.

This publication tends to demostration that support group meetings, SFH one-stop-shops and other awareness avenues must inform people irrespective of their HIV status on the latest finding on HIV researches on the best ways of preventing HIV transmission and the importance of religiously adhering to medication. This awareness campaigns need to intensified in the rural areas through their native dialects because the people in this areas lack adequate information on HIV generally, what constitutes sexual risky behaviour and the value of medication adherence/conformity. The authors therefore suggest that the peer and community educators/facilitators at counseling or support group meetings should be well trained in provide information of high veracity.

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