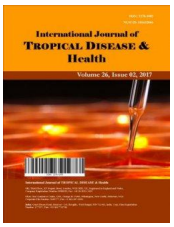

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HIV Prevalence and Intimate Partner Abuse in TIV Land, North Central Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: Several attempts have been made to document the relationship between HIV prevalence and partner violence. However, the relationship is still not clear. This present study adopted mixed methods to examine the relationship between HIV prevalence and violence amongst intimate partners in Nigeria.
Methods: The multi-stage and purposive sampling methods were used to obtain 1,621 (864 women; 757 men) respondents in four different locations for the study. Structured interviews using questionnaires and in-depth interviews (using a guide) were utilised for data collection. SPSS (version 21) was used for quantitative data analysis while the qualitative data was analysed thematically.
Results: The factors associated with multiple partnerships are location (P < 001; OR =.300; 95% CI = .210- .428); sex (P < 001; OR = 1.710; 95% CI = 1.391 -2.103); the desire for children (P = .024; OR = .735; 95% CI =.565-.952); receiving family support (P =.002; OR = .706; 95% CI = .565-.882) and the laws guiding sexual relationship that provide the ground for intimate partner abuse (P < 0.001; OR= 0.513; 95% CI = 0.375-0.700). Intimate partner abuse is carried out by both men and women using phones, informants, deprivations, tactics and antics.
Conclusion: The evidence suggests that there is a relationship between intimate partner abuse and HIV prevalence. Intimate partner abuse indicates another manifestation of the impact of HIV on

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human health. This study draws the attention of public health and clinical practitioners, policy makers and researchers to the co-existence of HIV prevalence and intimate partner abuse for possible intervention.

Keywords: Sexual behaviours; multiple partners; HIV prevalence; partner abuse; Africa.

1. INTRODUCTION

Over the past two and half decades, attempts have been made to examine the relationship between intimate partner violence and HIV [1,2]. However, the relationship is still not clear. The focus of this paper is on the relationship between HIV prevalence and partner violence in Nigeria, where over 40% of new cases of HIV infections come from 'low risk' stable relationships [3]. Theoretical and empirical evidence linking HIV prevalence and intimate partner violence would be of significant importance for developing the mechanism for addressing the problem of HIV and intimate partner violence.

Intimate partner violence is the behaviour within an intimate relationship that causes physical, sexual, or psychological harm, including acts of physical aggression, sexual coercion, psychological abuse, and controlling behaviour [4]. Studies have shown that partner violence exist amongst people living with HIV in East Africa [5-7], in USA [8], and Mexico [9]. Elsewhere, evidence associating HIV prevalence and partner violence has been documented [see 10,11,6,8,9]. Furthermore, a review of over 40 studies in Sub-Saharan Africa shows that men are generally older than their female partners, which has given them the physical advantage over their wives to predominate the sexual relationship through the use of violence, thus, exposing their partners to high risk of HIV infection [12]. Though it is not clear whether there is a causal relationship between partner violence and HIV infection or vice versa. To explore the relationship between specific aspects of intimate partner violence such as abuse, and HIV prevalence would further illuminate the relationship, and also provide information necessary for developing the mechanism for the prevention of stalking (partner violence) arising from engagement in multiple relationships and health concern (HIV risk).

Stalking as a form of abuse is the unpleasant control exercised by a partner over the other as a result of the implicit rights he or she claims in the relationship. It may sometimes lead to physical torture if the abused partner resist such unpleasant control. The existing literature on intimate partner violence is dearth of stalking as a form of abusive relationship. A handful of scholars examining domestic violence have considered stalking as a form of crime committed against the state, but did not link it with HIV prevalence and intimate partner violence; they posited that stalking is used in USA to exercise control over partners in intimate relationships [13]. Similarly, it would be presumed that stalking is contextually high amongst intimate partners in Benue State, Nigeria and it would be used in regulating the number of sexual relationships amongst partners and risk avoidance (HIV infection).

Cultural norms, values, and institutional regulation of sexual behaviours in some African have been eroded over time. Hence there is incidence of premarital sexual intercourse and extra marital relationships with multiple partners [14]. Attitudes to sexual behaviours have changed over time in response to socio-economic/structural factors including poverty, education levels, and unemployment [15-17]. Similarly, demographic factors such as age structure of the population, age at marriage, migration including seasonal workers, rural urban drift) as well as disruption due to war and political instability have also influenced changes in sexual behaviours which accommodate multiple relationships [18-21] These factors have produced several cases of multiple sexual relationships across the globe [14]; some taking place among intimate partners thereby setting the stage for abusive relationships.

Watts and May [22] hypothesised that multiple partnerships could cause the spread of HIV. Following, other scholars also expressed similar views [23-26]. However, Reniers and Watkins [27] noted that concurrency in polygyny is negatively correlated with the spread of HIV, while Kretzschmar, White and Careal [28] called for differentiation between different types of concurrency. As the debate continued, streams of research activities were carried out on multiple partnerships. These studies indicate that multiple partnerships are unsafe sexual practices and some of its correlates are economic deprivation, hardship, food insufficiency [29,17,30,31] perception and experiences [32] and structural

factors [15]. It could be inferred from the literature that multiple partnerships are associated with HIV prevalence and intimate partner abuse.

The first HIV/AIDS case in Nigeria was identified in 1986. Since then the sero-prevalence rate had increased from 1.8% in 1991 to 4.6% in 2008, before decreasing slightly to 4.1% in 2010 (National Agency for the Control of AIDS [3]. The programme interventions to stem the spread of HIV/AIDS are based on behaviour change and communication model (BCC). The focus is on creating mass awareness of the mode of transmission of HIV, counselling and testing of individuals, advocacy against premarital sexual intercourse, faithfulness to partners, and usage of condoms with non-regular partners. Despite these measures, it has been identified that HIV infection rates in the states of Benue, Akwa Ibom, Bayelsa and Anambra are more than 8%, or twice as high as the national average [33,3]. While the incidence rates of HIV infection at the national level in 2014 was 227,518 (National Agency for the Control of AIDS [34].

It is common for people to be afraid of being infected with HIV through multiple partnerships [35]. As people become aware of their friends or family members HIV sero-positive status, there seems to exist the tendency to maintain faithfulness with regard to sexual matters as advocated by behaviour change intervention programmes. This present paper explores the relationship between HIV prevalence and intimate partner abuse in Nigeria, where over 40% of new cases of HIV infections come from marital and cohabitation relationships [3].

2. METHODS

2.1 Theory

The study has utilised sexual webs model [36] to examine the relationship between HIV prevalence and intimate partner abuse amongst partners in Tiv Land. On the universal scale, the men have more sexual capacity (individual, family and structural factors) to initiate sexual relationship than the women. Therefore, men may have more sexual partners than the women while the women may stalk more than the men. However, in some instances, the women may possess enhanced sexual capacity from gainful activity or/and peer support to be in control of matters relating to sexual relationships, hence they may also keep multiple sexual partners. In such relationships, the men would be the ones to stalk more often. Stalking is basically meant to forestall a partner engaging in multiple sexual relationships that are pre-requisite for serious consequences of HIV infection. Behavioural change intervention programmes have called for a change in sexual behaviours that would ensure that each individual keeps only one sexual partner. This panacea for the spread of HIV through sexual intercourse may spur individuals to stalk as means of preventing their partners from engaging in multiple sexual relationships. The laws (structural factor as well as sexual capacity variable) guiding sexual relationships may also play an important role in providing an enabling environment for partners to stalk.

2.2 Quantitative Methods

The multi-stage sampling method was used in selecting 1,601 respondents in four different locations[a] (Mkar, Aliade, Udei and Jovkyundan which are towns and villages from Gboko, Gwer, Guma and Konshisha Local Government Areas of Tivland[b] respectively). An eight page questionnaire with closed and open ended questions (on background characteristics, risky sexual behaviours, sexual motivation and HIV) was used for data collection in the first stage. Face to face interviews were conducted with the respondents by the researcher (correspondent-author), with the aid of various research assistants. The questionnaires were pretested by conducting a mock data collection with 50 respondents before the actual data collection exercise. The internal consistency and reliability of the data collection instrument was very high (81%). The quantitative data collection lasted for five months between April and August, 2014. Completed questionnaires were scrutinised in the field to ensure exactness of the recorded information. Thereafter, they were retrieved and stored in a well secured office, accessed by the researcher alone.

At the completion of data collection, the responses were coded and entered into Statistical Product and Service Solution (SPSS) version 21 software, which has provision for the Generalised Linear Regression with Cumulative Link, which was used for the analysis of the quantitative data [see 37]. It should be noted that the response variable, multiple sexual relationships, is an ordinal variable with 3 categories. The probability of obtaining subcategory c_i across C categories of the dependent variable in N trials is not evenly distributed. In other words, the probability is not normally distributed. In this case, the sum of the

probabilities across the 3 categories of sexual intimacy will add to 1. The random value such as the mean obtained from this kind of distribution is not assumed to have come from normal distribution, because categorical variables assume finite or countable infinite number of values [37] Categorical variables are better described by binomial or multinomial probability distributions rather than normal distribution.

As stated above, multiple sexual relationship is an ordinal variable; however, there are no studies of this nature to provide empirical evidence from existing literature to suppose that the influence of the independent variables on the categorical membership of this variable follows that pattern. Thus, to accommodate the existence of a parallel structure where the independent variables have same effect on the odds of being in each successive category, a multinomial logistic regression is preferred over ordinal logistic regression [38]. The multinomial distribution is an extension of the Bernoulli probability distribution where the categorical variable has more than two categories. The other categories are separately compared to the selected reference group. Hence the choice of Generalised Linear Model with cumulative logit link for multivariate analysis. The data is replete with categorical variables with more than two categories including the dependent variables.

2.3 Qualitative Methods

In this segment of data collection, purposive sampling was used in selecting 20 respondents who participated in in-depth interviews. Five individuals were selected in each location. The interviews were conducted in Tiv language using a guide with questions on structural factors, motivations, partner abuse, risky sexual behaviours and HIV. An audio recorder was used for recording the discussions during the in-depth interviews for the purpose of transcription after the data collection sessions. The data were transcribed and analysed by the researcher. The findings from qualitative data provided further insight into the intricacies of multiple sexual relationships, HIV infection and stalking.

2.4 Ethical Issues

Application for Ethics clearance was sent to Australian Catholic University (ACU) human research ethic committee (HREC), and Ethics approval was given in March, 2014. The researcher adhered completely to the ethical provisions of both the University and other regulatory bodies (Nigeria) involved in overseeing research conducted involving human beings. The Ethics clearance from ACU was accepted by the Benue State University Ethics Committee for the conduct of this study. The research was conducted with integrity noting its responsibilities to all stakeholders. Both the consent to participate in the study and for the publication of the findings was obtained from the participants using ACU consent form before data collection activities.

3. RESULTS

Table 1 shows that there are more women than men in the first three age groups below age 35 years (11.5% vs 8.7%; 21.7% vs 14.4% and 23.7% vs 18.7%) while the men predominate in all the older age groups above 35 years. With regard to types of sexual relationship, the women are more heterosexual than the men (98.5% vs 97.1%). Whereas the men are more bisexual than the women (2.4% vs 1.3%), the women are more likely to be divorced, widowed or separated. By number of sexual partners, the women are more likely to keep either one (20.8% vs 15.0%) or two sexual partners (58.2% vs 54.3%) than the men, while the men are more likely to keep more than 2 sexual partners than the women (30.7% vs 21.0%; see Table 1).

It is clear from the background characteristics that, the population is young and sexually active, and the issue of multiple partnerships is common amongst men and women. After controlling for education, income, occupation, religion and condoms use; factors associated with multiple partnerships are location (P < 001; OR =.300; 95% CI = .210- .428); sex (P < 001; OR = 1.710; 95% CI = 1.391 -2.103); the desire for children (P = .024; OR = .735; 95% CI =.565-.952); receiving family support (P =.002; OR = .706; 95% CI = .565-.882) and the laws guiding sexual relationships that provide the ground for intimate partner abuse (P < 0.001; OR= 0.513; 95% CI = 0.375-0.700). Those who are HIV sero-negative are 1.1 times more likely to keep fewer numbers of sexual partners and less likely to abuse partners than those who are HIV sero-positive. Similarly, those whose relationships are guided by religious law are 56.5 times less likely to keep fewer numbers of sexual partners relative to those whose relationships are guided by customary and court laws. Both customary and religious laws provide that the man has rights over the woman and can exercise control over her. Thus, partner abuse is more prevalent in

relationships guided by customary and religious laws than the ones guided by court laws.

Approximately 35% of those receiving treatment for a period less than 1 year; 32.2% of those receiving treatment between 1year and less than 3 years; and 41.3% of those receiving treatment for a period of between 3years and less than 5years have stayed in their current relationships far longer than the period they have been receiving treatment, indicating that they might have been infected while in the current relationships (see Table 3).

The tendency of abusive partners to keep multiple partnerships despite HIV prevalence has also caused anxiety over other issues such as finance amongst partners. Some individuals have been forced to use baits such as food and 'other food' (sex) to dissuade their partners from engaging in other relationships. A respondent describes the problem and attendant issues in the following statement:

> *I don't understand his movements, but when I complain, he gets angry. I am not happy. I don't want my husband to look for other women because he may get disease and infect me, he may use our hard earned money to buy things for other women. I try my best, I give him food and ready to give him the other food but I don't know what he is lacking. I don't like what he is doing* (Female, 22years, Married).

Table 1. Age, relationship status, number of sexual partners, and types of relationship by sex

	Sex			%
	Male	**Female**	**Total**	
Age				
18-19yrs	8.7%	11.5%	163	10.2
20-24yrs	14.4%	21.7%	293	18.3
25-29yrs	18.7%	23.7%	342	21.4
30-34yrs	21.4%	20.7%	336	21.0
35-39yrs	8.4%	6.7%	120	7.5
40-44yrs	11.1%	6.2%	136	8.5
45-49yrs	6.4%	5.9%	98	6.1
50-54yrs	6.4%	2.2%	67	4.2
55-59yrs	17%	0.5%	35	2.2
60+	0.9%	0.5%	11	0.7
Total	749	852	1601	
%	100	100	100	
Types of relationship				
Heterosexual	97.1%	98.5%	1566	97.8
Bisexual	2.4%	1.3%	29	1.8
Lesbian	0.0%	0.2%	2	0.1
Homosexual	0.5%	0.0%	4	0.2
Total	749	852	1601	
%	100	100	100	
Number of Partners				
One	15.0%	20.8%	289	18.1
Two	54.3%	58.2%	903	56.4
More than two	30.7%	21.0%	409	25.5
Total	749	852	1601	
%	100	100	100	
Relationship status				
Married	55.7%	47.3%	820	51.2
Single	35.2%	30.9%	527	32.9
Widowed	3.2%	11.6%	123	7.7
Divorced	2.1%	5.0%	59	3.7
Separated	3.3%	4.7%	65	4.1
Cohabiting	0.4%	0.5%	7	0.4
Total	749	852	1601	
%	100	100	100	

The source of data is from field survey, 2014

Table 2. Multiple sexual partnerships and abuse

Variables		Test of hypothesis			95% Confidence interval for odd ratio	
Number of Partners	**B**	**df**	**Sig.**	**Odd ratio**	**Lower**	**Upper**
One sexual partner	-3.028	1	0.000	0.048	0.026	0.090
Two sexual partners	-0.158	1	0.603	0.854	0.472	1.546
Location						
Urban-Ipusu	-0.260	1	0.129	0.771	0.551	1.079
Urban-Ichongu	0.020	1	0.915	1.020	0.706	1.475
Rural - Ipusu	-1.204	1	0.000	0.300	0.210	0.428
Sex (Male)	0.537	1	0.000	1.710	1.391	2.103
Laws guiding relationship (tendency to stalk)						
Religious laws	-0.668	1	0.000	0.513	0.375	0.700
Customary laws	-0.298	1	0.063	0.743	0.543	1.016
Court laws	0.330	1	0.298	1.390	0.747	2.587
Type of family support received						
Money	-0.348	1	0.002	0.706	0.565	0.882
Material	-0.035	1	0.831	0.966	0.701	1.330
Money and Material	0.733	1	0.002	2.082	1.299	3.336
Motivation (Need Money)						
Strongly disagree	-0.586	1	0.018	0.557	0.343	0.903
Disagree	-0.341	1	0.132	0.711	0.456	1.108
Agree	-0.017	1	0.939	0.983	0.633	1.527
Would like children						
Strongly disagree	-0.188	1	0.394	0.829	0.538	1.276
Disagree	0.196	1	0.215	1.216	0.893	1.657
Agree	-0.305	1	0.024	0.737	0.565	0.962
Desire favour						
Strongly disagree	-0.226	1	0.331	0.798	0.506	1.258
Disagree	-0.586	1	0.008	0.557	0.361	0.858
Agree	-0.317	1	0.126	0.728	0.485	1.093
Partners' HIV Status						
Positive	-0.074	1	0.621	0.928	0.691	1.247
Negative	0.103	1	0.446	1.109	0.850	1.445

The source of data is from field survey, 2014

Table 3. Duration of receiving treatment by duration of current sexual relationship (in years)

	Duration on Drugs (percentage distributions)					
	Less than 1 yr	**1 to less than 3 yrs**	**3 to less than 5 yrs**	**Over 5 yrs**	**Total**	**%**
Duration of relationship						
Less than 1yr	35.2	21.6	19.4	10.1	174	21.8
Over 1 but less 5yrs	**38.8**	46.0	39.3	26.8	312	31.8
Over 5yrs	**28.9**	**32.3**	**41.3**	63.1	319	39.6
Total	159	291	206	149	805	
%	100	100	100	100	100	

The source of data is from field survey, 2014

A similar concern have been expressed by a widow whose male children are married but dwelling in the same compound with her. She reported that, HIV prevalence and the consequences of impending family extinction have made her sons to monitor their wives closely, to foreclose any attempt of unfaithfulness. Her words:

Married people are having problems with their marriages due to infidelity. My children don't want their wives to go out because if they are infected with HIV, the whole family will perish. This is the reason most people don't want their partners to go after other partners (Female, 60years, widow).

Furthermore, to suggest that greed and poverty are some of the factors responsible for multiple partnerships may not be out of point. The mood of a female respondent and her tone of expression suggests that she was involved in a relationship where the man was very abusive. He exhibited insatiable quest for multiple relationships, which could have been the source of her infection. She presents a graphic description of the problem of multiple partnerships stemming out of greed and poverty in the following words:

> *The women think if this partner does not meet my needs, I can get it here or there. For the men I don't know whether it is greed, one partner you are not satisfied, two partners you are not satisfied, three partners you are not satisfied, I don't understand. Among married individuals, they do it. It is common, I cannot hide it* (Female, 24years, separated, PLWH)

It is common for abusive partners to engage in making phone calls to their partners at certain period of the day to monitor them. A quite background or the one with semblance of home environment is associated with privacy and likelihood of sexual partners meeting in such a place. While a noisy background is associated with public environment and less likelihood of being a meeting point for sexual partners. This behaviour has been captured in an excerpt from a respondent narrative as provided below:

> *Sometimes you need to monitor what your partner is doing. My neighbour will drop his wife at the market and come back home; he will wait for some minutes and call her to know whether she is still at the market place. If there are no noise at the background, the wife must explain where she went to, because the market place is always noisy, it cannot be quite* (Male, 35yrs; Married, PLWH).

Some partners employ the tactic of following behind after their partner(s) had left home for a business, to see if the partner wants to engage in any act of unfaithfulness. Again the statement below elucidates this fact.

> *The easiest thing people do to detect their partner's infidelity is by checking for their spouses in the areas where they suspect something is happening. You wait a while, after your partner has gone out and follow to see what the person is doing.* (Female, 40yrs; married).

Other partners who are educated engage in the habit of checking the call log in their partner's phone to ascertain whether a stranger called, or had been called. The checking is done secretly when the partner returns home after an outdoor engagement. While those who are not educated eavesdrop when their partners are conversing on the phone to get a hint. Sometimes individuals may seek assistance from friends or relations to keep a close watch on their partner (s). These abusive behaviours have also been reported in the statement below:

> *Men and women who are educated check the phone log to dictate calls made by their partners in the day. When a partner comes home and drop his or her set to take bath or do something, the other will pick and check the people she or he has called. Those who are not educated always want to listen to conversation to know who the partner is talking to. They sometime tell friends or relations to keep watch on their partners* (Male, 31years, married).

There are also indications that partners may engage in intense levels of abuse such as placing the other under siege, physical confrontation where possible, and calling the attention or seeking for assistance from neighbours especially where such partner is on reprisal mission. This assertion is supported by the response from one of the respondents stated below:

> *When she finally opened the door, another man who was inside the room with the woman tried to escape, but he was overpowered by the husband; who caught him and was also shouting calling for help and machete. When all of us came out, we now realised why the man was shouting. The man had done this for many times but he justifies his action by saying that the wife had also sent him away from a place he had gone to pass a night with another woman. She had been spying on him and she goes everywhere looking for him whenever he is not at home. If it is good for him, it should be also good for her* (Male, Single 21 years PLWH).

Emotionally laden intimate relationship are common. Those who are infected with HIV but

still keeping multiple relationships aggravate the disease conditions of their partners as noted by one of the respondents:

> *To have secret relationship is not good because it may bring sickness into the relationship. But as I am talking, several people, men and women are still keeping more than one partners. It is common despite the bad conditions of diseases and pains* (Male, 35years, married, PLWH)

The disaffection and disunity caused by unfaithfulness may forestall the partners from forming a common pool of resources to training the children. Unfaithfulness is one of the reasons most sited for the dissolution of sexual relationships. These issues are aptly expressed in the statement below:

> *It is good to only have one sexual partner. You see for instance when one partner who is unfaithful brings sickness to other, it causes disaffection and disunity. It affects the children too because it forestall collaborative training of the children and it can also bring dissolution of the relationship* (Female, married, 30yrs, PLWH).

4. DISCUSSION

It is evident that multiple concurrent sexual relationships could facilitate the spread of HIV in Nigeria [39,40], Uganda [17] and Sub-Saharan Africa [41]. However, HIV prevalence and intimate partner abuse is given less attention in Nigeria. The results from this study have shown that those who are HIV sero-negative are more likely to keep fewer numbers of sexual partners and less likely to abuse partners than those who are HIV sero-positive. This suggests a relationship between HIV prevalence and intimate partner abuse. It seems the abuse of partners could make the individuals vulnerable to overtures to engage in multiple relationships as a form of respite from abuse despite the risk of HIV infection. Similarly, religious and customary laws provide that the man has rights over the woman and can exercise control over her. Hence partner abuse is more prevalent in relationships guided by customary and religious laws than the ones guided by court laws. Majority of the intimate relationships in the study area are guided by customary and religious laws where partner abuse prevails and is responsible for over 40% of new cases of HIV infections [3]. The factors associated with multiple partnerships and tendency to stalk are location, sex, favours, dependence on family support, the desire for children and the laws guiding the sexual relationships. The evidence available suggests that HIV prevalence as well as multiple sexual relationships and laws guiding sexual relationships (especially religious and customary) are associated with partner abuse amongst Tiv people of North Central Nigeria. Elsewhere, some studies have observed a significant relationship between partner violence and HIV infection [5,42,7] Women in Kenya who had suffered partner physical and sexual violence were 1.8 times more likely to be infected with HIV than those who did not suffer violence [5]. Likewise, pregnant women in Rwanda who were HIV positive were 2.38 times more likely to suffer partner violence than their counterpart who were not HIV positive (42). There is a consensus between this study and some of the previous ones [5,42,7] on the relationship between HIV prevalence and partner violence. Furthermore, multiple relationships could facilitate the spread of HIV.

5. CONCLUSION

There is strong evidence to suggest that there is a relationship between HIV prevalence and partner abuse amongst partners in Tiv Land. This study draws the attention of public health practitioners, doctors, researchers and other stakeholders to the association. Partner abuse is also another manifestation of the impact of HIV on human health. Exploring the relationship between partner abuse and HIV prevalence would illuminate the relationships, and also provide information necessary for developing mechanism for the prevention of partner violence and HIV epidemics.

ETHICAL APPROVAL

Application for Ethics clearance was sent to Australian Catholic University (ACU) human research ethic committee (HREC), and Ethics approval was given in March, 2014. The researcher has adhered completely to the ethical provisions of both the University and other regulatory bodies (Nigeria) involved in overseeing research conducted involving human beings. The Ethics clearance from ACU was accepted by the Benue State University Ethics Committee for the conduct of this study. The research was conducted with integrity noting its responsibilities to all stakeholders. Both the consent to participate in the study and for the

publication of the findings was obtained from the participants using ACU consent form before data collection activities.

CONSENT TO PUBLISH

Both the consent to participate in the study and for the publication of the findings was obtained from the participants using ACU consent form before data collection activities.

AVAILABILITY OF DATA AND MATERIAL

The datasets during and /or analysed during the current study are not publicly available due to ethical issues but are from the corresponding author on reasonable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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