The Spectrum of Intimate Partner Violence against Women in Nigeria: Examining Regional Disparities Using a National Representative Survey

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Abstract

We examined the relationship between the region of residence and the spectrum of Intimate Partner Violence (IPV) in Nigeria. This quantitative research utilized nationally representative data. The IPV spectrum are; sexual violence, emotional violence, less severe violence, and severe violence. Data were analyzed using logistic and generalized linear regression models ($\alpha_{0.05}$). IPV prevalence was 35.9% in Nigeria and it was: South-East (48.3%), North-Central (47.4%), North-East (47.3%), South-South (46.5%), North-West (27.0%), and South-West (19.8%). The likelihood of sexual, emotional, and severe IPV was higher in the North-Central, North-East, North-West, South-East, and South-South than South-West. The common predictors across all the spectrums of IPV include region, education, husband/partner drinking alcohol, and childhood experience of parental violence. The level of IPV and its spectrum is high in Nigeria, but prominent disparities exist between the regions with North-East and South-East mostly affected. Regional-specific programs that aim to mitigate IPV in Nigeria are strongly solicited.

Keywords: Intimate partner violence, Women's health, Region, Nigeria

1.0 Introduction:

Intimate Partner Violence (IPV) is a human rights violation observed from an intersectional perspective and strongly intertwined with other forms of societal inequalities (World Health Organization, 2020). This devastating social problem occurs in all societies and it includes physical, sexual, emotional, and controlling behaviors perpetrated by an intimate partner (World Health Organization, 2020). IPV often occurs as a single domain or in a sequential manner where physical IPV is accompanied by sexual IPV, and then emotional (World Health Organization, 2020). IPV against women is more prevalent in the societies like Nigeria where early marriage is still dominant among girls with the median age at first marriage being 19 years (National Population Commission and ICF, 2019). The outcome of IPV among women includes bruises and welts, lacerations and abrasions, fractures, sight and hearing damage, head and neck injury, depression, functional disorders, and stress-related conditions (Heise and Garcia, 2002; Garcia-Moreno et al., 2013). Sexual IPV has implications for unwanted pregnancy, abortion and unsafe abortion, sexually transmitted infections, pregnancy complications, pelvic inflammatory disease, and maternal mortality (World Health Organization, 2020; Heise and Garcia, 2002; Apatinga et al., 2022). The survivors of IPV may have difficulty maintaining personal relationships, returning to work or school, and regaining a sense of normalcy years after the experience (World Health Organization, 2011). These issues tend to disrupt earning power and have a long-term effect on the socioeconomic advancement of the survivors and their families.

The overwhelming global burden of IPV is borne by women and was highly prevalent across the globe before the COVID-19 pandemic era (Sardinha et al., 2022). Worldwide, 27% of ever-partnered women aged 15-49 years are estimated to have experienced physical or sexual, or both,

intimate partner violence in their lifetime, and this varies widely across countries and world sub-regions (Sardinha et al., 2022; World Health Organization, 2018). In Western Europe, Eastern Asia, and Northern America, the IPV was 21%, 20%, and 25% respectively, while it was 33% in sub-Saharan Africa (World Health Organization, 2018). Violence against women is of great concern to the Nigerian Government. Consequently, the Violence Against Persons Prohibition Act which aims to eliminate all forms of violence including the right to assistance for victims of violence was passed into law in 2015 (Federal Ministry of Women Affairs and Social Development, 2015). Sexual abuse is an offense under several sections of chapter 21 of the Nigerian criminal code (Criminal Code Act, 1990). Nigeria is a signatory to the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW). Some state governments in Nigeria have signed into laws Acts against IPV. More than 50 different support groups had been established in Nigeria to actively respond to cases of Gender-Based Violence (GBV) and both the states and Federal Ministries of health, women's affairs, and justice units specifically assigned the responsibilities to react to GBV cases. Despite all the efforts to eliminate IPV in Nigeria, its prevalence in 2018 was 36% higher than the value recorded in 2013 (25%) (National Population Commission and ICF, 2019), with this trend in IPV, the Nigerian Government is not on track to meet the SDG targets for the elimination of violence against women and girls by the year 2030 (United Nations, 2015).

In the face of the high prevalence of IPV, numerous factors have been identified as predictors of this unacceptable problem by earlier studies conducted in Nigeria and elsewhere (Alkan and Tekmanlı, 2021; World Health Organization, 2016; Gilbert et al., 2020). Among the factors are those that are related to attitudes and beliefs, as well as behavior arising from situations and social

conditions that provide opportunities and support for sexual abuse. Individual factors include alcohol and drug consumption, and psychological factors, while the peer/family factors are gang rape, early childhood environments, family honor, and sexual purity. The community factors are poverty, physical, and social environment, whereas the social factors are the laws and policies, social norms, global trends, and economic factors (Tiruye et al., 2020; World Health Organization, 2016). IPV is more pronounced in societies threatened by insecurity, poverty, and a high rate of unemployment. These drivers of IPV characterize many settings in Nigeria. Cases of IPV are on the increase in Nigeria but are yet to attract full research attention. Persistent daily reporting of IPV in Nigerian media points to a failure in the structure of handling this crime. Abused women often stay in violent relationships for economic survival, the stigma attached to marital dissolution, stigmatization by their family and community members, fear of losing custody of children, and the anticipation that the partner will change (Gharaibeh and Oweis, 2009).

In the past few decades, campaigns have been devoted hugely to the awareness of any form of IPV as a violation of human rights that affects an entire society (Federal Ministry of Women Affairs and Social Development. 2015). These campaigns have helped to rally support for and influence change in international and national legislative and policy frameworks. Despite such progress, IPV is still rampant in Nigeria. A continuous, protracted effort throughout society and across disciplines is needed to effectively address the causes of IPV, which are rooted deep in social attitudes and practices. Therefore, this study aims to assess the difference in the IPV spectrum including sexual violence, emotional violence, less severe violence, and severe violence across the six regions in Nigeria; and identify the main socioeconomic drivers of IPV in Nigeria while using the region as the key explanatory factor. The diverse population groups in Nigeria due to its large population

size are indications that analysis of important social problems like IPV be regionally based. The design and scope of this study will enable the government to build the knowledge base, raise awareness, and significantly contribute to the existing knowledge on IPV in Nigeria. A common knowledge of the causes of IPV can help regions in Nigeria develop effective responses to the violence.

1.1 Theoretical framework

Theories have been propagated to unravel reasons for violence in partnership. Sociocultural theories address the influence of social class, education, and income on violence against women and integrated both social structures and family processes (Claire et. Al., 2001). Family violence theorized that the occurrence of IPV is associated with the existing social structures rather than the individual, therefore, proper examination of social structures can be used to understand the mechanisms responsible for IPV within the family (Gurman and Kniskern, 1981). Learned behavior theory of violence posited that violence was learned and that men batter women because of their childhood exposure to violence, and women abuse men because they saw their mothers being abused (Bandura, 1977). The feminist theory perceives IPV as an expression of gender-based domination of women by men (Lawson, 2012). The loss of control theory postulated that men are abusive when they drink or due to their inability to control their anger and frustration (Bostock et al., 2002). The "cycle of violence" emphasized that men's tension is built until they explode and become violent (Hill and Rodgers, 1964).

The family/relationship conflict model assumes that either the relationship is characterized by mutual violence or that in some circumstances women provoke their partners by 'below-the-belt' arguments until they explode in a violent rage (Bowlby, 1982. The Power and Control Wheel theory was based on the assumption that violence is perpetrated chiefly by men to exert power and control over their wives in line with certain societal expectations of who is in charge and what the suitable apparatuses are for implementing that supremacy. Such attitudes and beliefs, rather than the victim's behavior, determine whether or not perpetrators are domestically violent (Ganley and Schechter, 1995). The larger context of society theory perceives violence as a logical outcome of relationships of dominance and inequality moderated not only by the individual choices or desires of some men to dominate their wives, but by how society defines socioeconomic relationships by sex, marriage, and families.

Virtually all these theories apply to reasons for IPV against women in Nigeria. Like most African countries, Nigeria is a patrilineal society where almost all household decisions including those that pertain to women are made by men (Dogo, 2014). In either marriage or cohabitation, this tradition underscores the need for women to be submissive to their husbands. The harsh economic conditions in the face of poor social infrastructure, lack of job opportunities, poverty, stress, and gender equality crusade eroding the cultural marital values can predispose spouses to avoidable IPV in Nigeria (Dogo, 2014). Across the country, there exists ethnic clustering in each of its six regions. The people of Hausa/Fulani, Igbo, and Yoruba which constitute the three major ethnic groups in Nigeria dominate the regions in the North, South-East, and South-West respectively. Therefore, it is not doubtful that ethnic diversities in socioeconomic status, cultural values, and

adherence to the tenets of traditional rules may define the state of IPV differently in each of the six regions in Nigeria.

2.0 Material and Methods

2.1 Study area

The study was conducted in Nigeria. The Nigerian population figure has been estimated to be about 215 million and the world population projection showed that Nigeria will be the third most populous country by the year 2050 if the present age-specific fertility rate and population growth rate are sustained throughout the period (World Population Prospect, 2019). The broad-based nature of Nigeria's population pyramid at present is an indication that the projection is likely to be realizable if unchecked. Acquiring formal education in Nigeria is not free, especially at both secondary and tertiary levels. Virtually in every part of Nigeria, men are the head of the family and the culture demands that women submit to their husbands. Most of the time, household decisions cannot be made without the approval of the household's head. Nigeria is characterized by a diverse culture and different ethnic groups, with the three major ethnic groups being Hausa/Fulani, Igbo, and Hausa. Although IPV and its domains are underreported in Nigeria, there is an increasing trend in the reporting of this problem by the victims in recent times. Nigeria is divided into 36 states including Federal Capital Territory (FCT) Abuja, and states are combined based on their geographical location to form six regions. These are North-Central, North-East, North-West, South-East, South-South, and South-West (Figure 1).

[Figure 1 is here]

2.2 Study Design and Population

A cross-sectional design was used for the study and the participants were married/cohabiting women of reproductive ages (15-49 years). A woman is said to be married or cohabiting in this context if she is living with a man who is her sexual partner and in a family way. However, the analysis was restricted to women who provided complete information that was used to measure each of the spectrums of IPV. Therefore, the sample analyzed in each region was 913, 1039, 1851, 731, 666, and 1361 in North-Central, North-East, North-West, South-East, South-South, and South-West (National Population Commission and ICF, 2019).

2.3 Sampling Procedure

The 2018 NDHS sampling frame was adapted from the 2006 Population and Housing Census conducted in Nigeria. Administratively, Nigeria is divided into states. Each state is subdivided into local government areas (LGAs), and each LGA is divided into localities. Each locality was subdivided into census enumeration areas (EAs) referred to as a cluster and all localities were classified separately into urban and rural areas. A two-stage stratified sampling technique was used for sample selection and this was implemented by separating each of the 37 states into urban and rural areas. In total, 74 sampling strata were identified and samples were selected independently in every stratum using a two-stage selection. In the first stage, 1,400 EAs were selected with probability proportional to EA size. A household listing operation was carried out in all selected EAs, this constituted the sampling frame for the households' selection at the second stage. At this stage, a fixed number of 30 households was chosen in every cluster through systematic sampling, resulting in the selection of 42,000 households. Due to the non-proportional allocation of the

sample to different states and the possible differences in response rates, sampling weights were calculated and applied to enhance representation at the national and domain level. The 2018 NDHS included all women aged 15-49 years in the sample households. In a subsample, one eligible woman in each household was randomly selected to be asked additional questions about domestic violence. The survey was successfully carried out in 1,389 clusters (National Population Commission and ICF, 2019).

2.4 Dependent Variables

In this study, five outcome variables were used to examine the violence experienced by women as perpetrated by their intimate partner (husband/partner). These are Emotional Violence (EV), Less Severe Violence (LS_{ev}), Severe V (S_{ev}), Sexual Violence (SV), and Any Intimate Partner Violence (IPV).

[Table 1 is here]

Emotional violence, if the response to any of the questions a-c was yes (at least 1 out of 3). Less severe violence, if the response to any of the questions d-g was yes (at least 1 out of 4). Severe violence, if the response to any of the questions h-j was yes (at least 1 out of 3). Sexual violence, if the response to any of the questions k-m was yes (at least 1 out of 3). The overall score x that is obtainable by any woman is in the range $0 \leq x \leq 13$. Thus, a woman is said to experience any IPV, if her response to any of the questions a-m was yes (at least 1 out of 13).

$$\mathbf{EM} = \begin{cases} \text{Yes, if} & 1 \leq w \leq 3 \\ \text{No, if} & w = 0 \end{cases} \qquad \mathbf{LS_{ev}} = \begin{cases} \text{Yes, if} & 1 \leq x \leq 4 \\ \text{No, if} & x = 0 \end{cases}$$

$$\mathbf{S_{ev}} = \begin{cases} \text{Yes, if} & 1 \leq y \leq 3 \\ \text{No, if} & y = 0 \end{cases} \qquad \mathbf{SV} = \begin{cases} \text{Yes, if} & 1 \leq z \leq 3 \\ \text{No, if} & z = 0 \end{cases}$$

2.5 Independent variables

The independent variables include age, region, place of residence, level of education, religion, ethnicity, wealth index, and media access. Others are the number of living children, marital/ cohabitation duration, husband/partner's education level, work status of the women, husband/partner's age, household decision-making power, total lifetime number of sex partners, husband/partner drinks alcohol, and respondent's father ever beat her mother.

Media access was created using the information on the frequency of reading newspapers or magazines, frequency of listening to the radio, frequency of watching television, and frequency of using the internet. The responses to each of the questions were not at all, less than once a week, at least once a week, and almost every day. Scores were assigned to the responses as not at all =0, less than once a week =1, at least once a week =2, and almost every day =3, thus resulting in the least score of 0 and a maximum score of 12. The aggregate score for each woman was categorized as None, Low, and High if the respondent scored 0, 1-5, and 6-12 respectively. Household decision-making power was generated from four variables. These are; persons who usually decide on the respondent's health care, the person who usually decides on large household purchases, the person who usually decides on visits to family or relatives, and the person who usually decides what to do with the money the husband earns. The responses to each of these questions were graded as respondent alone =2, respondent and husband/partner =1, respondent and other people =1,

husband/partner alone =0, someone else =0, and others =0, thus producing an overall score of 8 points which was disaggregated as 0=None, 1-3=Low, 4-8=High.

Consequences of IPV were captured as respondents ever had bruises because of their husband/partner's actions, ever had eye injuries, sprains, dislocations or burns because of their husband/partner's actions, and ever had wounds, broken bones, broken teeth, or other serious injuries because of husband/partner's actions.

2.6 Data analysis

Due to the complex nature of the sampling technique used for data collection, the data was weighted before the conduct of statistical analysis. SPSS version 25.0 was used for data analysis and data were presented using charts and tables. Frequency and descriptive statistics were used to describe the data. Cross-tabulation of each component of the spectrum of IPV and demographic/ socioeconomic characteristics was done and an association between these variables was assessed using the Chi-square model. Each domain of IPV investigated in this study is dichotomous. Therefore, at the level of multivariate analysis, a binary logistic regression model was used to examine the demographic and socioeconomic predictors of each domain of IPV and region. This involves both unadjusted and adjusted models. It models how the odds of cases in each domain of IPV depend on region amidst other independent variables (equation 1).

$$\text{logit}(\pi_i) = \log\left(\frac{\pi_i}{1-\pi_i}\right) = \beta_0 + \beta_i x_i \qquad (1)$$

However, the IPV score as an outcome variable was analyzed in quantitative terms using a generalized linear regression model. The regression parameters β_i, corresponding standard errors, and test statistics were generated. The Maximum Likelihood Method (MLE) was used for the parameter estimation. The generalized linear regression model (equation 2) is a flexible generalization of ordinary linear regression. The model handles a continuous dependent variable given either a quantitative or categorical set of variables. It relates to the response variable through a link function why creating an allowance for the magnitude of the variance of each measurement to be a function of its predicted value. In the model, the response variable y_i is assumed to follow an exponential distribution with mean $\mu_i$assumed to be a function of $x_i^T\beta$. Diagnostic checks were performed to ensure that the assumptions of the model are not violated. The assumptions are; the IPV scores were independently distributed i.e the cases of IPV are independent, the IPV score assumes an exponential distribution, and there was a linear relationship between the transformed expected response in terms of link function and independent variables.

$$y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \cdots + \beta_i x_i + \varepsilon_i \qquad (2)$$

Four models were used to examine the relationship between region and IPV in this study. The first model was at the level of bivariate, where only region was included in the model. All others were adjusted models. In model 2, only the demographic factors and region were included in the model as explanatory variables, while model 3 was restricted to only socioeconomic characteristics and region as the explanatory variables. In the last model which is the full model, all the variables were included in the model with the view to ascertain the key predictors of IPV in the presence of region as the focused independent variable. The goodness of fit of each of the models was assessed using

log-likelihood, Akaike's information criterion (AIC), and Bayesian information criterion (BIC). All analyses were conducted at a 5.0% level of significance.

2.7 Ethical Consideration

The survey was conducted under relevant guidelines and regulations. Permission to use the data was sought and granted by the data originator. However, ethical approval to conduct the study was obtained from the National Ethical Review Committee (NREC), and informed consent was also obtained from the respondents before the conduct of the interview. The respondents were assured of the anonymity of the information they provided. The possible identifier that could be used to track each respondent to the information they provided was removed from the data before use.

3.0 Results

The mean age of all the respondents was 30.40±7.7 years and this varies across the six regions in Nigeria (North-Central (29.77±7.4), North-East (28.79±7.9), North-West (28.82±8.3), South-East (32.29±6.8), South-South (31.97±7.1), and South-West (32.42±6.5)) (**Figure 2a**). The mean IPV score was highest in the South-East (3.27±5.1), followed closely by South-South (3.17±4.8), then North-East (2.77±4.5), North-Central (2.52±3.6), South-West (1.24±3.4), and North-West (1.24±2.6) (**Figure 2b**).

[Figure 2 is here]

The data presented in Figure 3 show that emotional violence was mostly experienced by women in each of the regions in Nigeria with the highest prevalence observed by the women living in the

North-East (41.6%) and least in the South-West (15.0%). Sexual violence occurred mostly in the North-East (14.2%), followed by South-South (8.9%), and least in the South-West (2.0%). About 18.3%, 11.7%, and 10.7% of women in the South-East, North-Central, and South-South had experienced severe violence in their current marriage/cohabitation respectively, while women living in the North-West (1.9%) had the least. In order of higher prevalence, the overall intimate partner violence was 48.3%, 47.4%, 47.3%, 46.5%, 27.0%, and 19.8% in the South-East, North-Central, North-East, South-South, North-West, and South-West respectively (Figure 3).

[Figure 3 is here]

In Table 2, the data depict that a significant association exists between age, region of residence, residence, number of living children, and sexual violence. Emotional violence (30.9%) was mostly experienced by the studied women, followed by less severe violence (17.5%), severe violence (7.9%), and Sexual Violence (6.6%). The overall prevalence of any IPV was 35.9%). Sexual violence was mostly experienced by women in the age group 15-24 years (7.9%) but least among those aged 25-34 years (6.0%). Sexual violence was higher in the rural (7.6%) than the urban dwellers (5.3%) and most prevalent among women who have at least five living children (8.5%) but least in those who have 3-4 surviving children. A similar pattern to sexual violence was observed among the women concerning their experience of emotional violence as far as the variables place of residence, age, and number of living children. Marital duration and lifetime number of sexual partners were found to be significantly associated with emotional violence. The prevalence of emotional violence was 33.4% among women who had at least 2-lifetime sexual partners compared to 29.3% among their counterparts who had only one.

Older women experienced higher less severe and severe violence than younger ones. Women who have at least five living children (10.2%) experienced higher severe violence than those who either have 3-4 (8.9%) or 0-2 (5.9%) living children. The prevalence of severe violence increases with the husband/partner's age with women whose husband/partner was in the age group 15-24 years having a 2.9% prevalence compared to those in the age group 35-44 years (8.5%). Severe violence was more prominent among women who have more than one (11.0%) lifetime sexual partner than those with only one (6.0%). As for the overall IPV, its prevalence was significantly higher in the rural (33.2%) areas than the urban (38.2%) and increased as the number of living children increased.

[Table 2 is here]

In Table 3, the data show that the percentage of women who experienced sexual violence falls consistently with an increasing level of education. It reduces from 7.8% among women who had no formal education to 1.8% among their counterparts with a higher level of education. This pattern was found across other domains of IPV, but the prevalence of severe violence was more among women who had primary (12.8%) and secondary education (9.3%) than those with no education (5.9%) and higher (3.5%) education. A significant association was established between all domains of violence and religion except sexual violence. However, the percentage of women who experienced any of the IPV domains was persistently higher among Christians than Muslims. Women who belong to Igbo ethnic group had a higher proportion of their members who had experienced any form of IPV than Hausa/Fulani and Yoruba. While the Yoruba's had the least percentage of women who had experienced sexual violence (2.1%), emotional violence (17.7%),

and overall violence (22.5%), the least was observed among Hausa/Fulani women concerning less severe (10.0%) and severe violence (3.1%). The prevalence of sexual violence reduces steadily from 8.3% among the poor to 7.6% for the women in the middle class, and 4.4% among the rich, and a similar pattern was observed by the variable media access. The prevalence of sexual violence, emotional violence, less severe violence, severe violence, and overall violence was significantly higher in women whose husband/partner drinking alcohol. Women who reported that their father beats their mother experienced higher IPV in marital union or cohabitation than those who reported otherwise and this cuts across all the spectrum of violence except less severe violence.

[Table 3 is here]

Figure 4 shows the distribution of 1374 women in marriage/cohabitation who had experienced IPV by region according to the type of injury sustained during the encounter. Across the three classifications of the injury type, the women who live in the South-East had the highest prevalence than any other region in Nigeria and the least among women in the North-West. The percentage of women who had experienced bruises because of the husband/partner's action was 39.5%, 34.8%, and 27.6% among women living in the South-East, South-West, and South-South respectively, while it was 22.8% in the North-East, 13.2% in the North-Central and 11.1% in the North-West. As for women who ever had eye injuries, sprains, dislocations, or burns because of their husband/partner's actions, the highest was found among women in the South-East (16.2%), followed closely by women in the South-West (15.5%), North-East (9.7%), South-South (8.4%), North-Central (4.3%), and North-West (3.0%). The data further showed that the South-East

(12.9%) and South-South (11.7%) women experienced the highest percentage of women who ever had wounds, broken bones, broken teeth, or other serious injuries because of husband/partner's actions. The proportion of women with this encounter was 10.4%, 8.3%, 3.9%, and 2.0% in the North-East, South-West, North-Central, and North-West respectively.

[Figure 4 is here]

The unadjusted model of the relationship between the region and sexual violence showed that the likelihood of sexual violence was 8.32(95% C.I=5.46-12.67, p<0.001), 4.82(95%C.I=3.02-7.69, p<0.001), 4.62(95% C.I=2.90-7.34, p<0.001), 3.78(95% C.I=2.38-5.98, p<0.001) and 1.98(95% C.I=1.26-3.12, p=0.003) times more likely among women living in the North-East, South-South, South-East, North-Central, and North-West than their counterparts living in the South-West respectively. The odds ratio of emotional violence was higher among women living in the North-Central (OR=3.83, 95% C.I=3.14-4.68, p<0.001), North-East (OR=4.04, 95% C.I=3.33-4.90, p<0.001), North-West (OR=1.96, 95% C.I=1.64-2.36, p<0.001), South-East (OR=3.79, 95% C.I=3.07-4.68, p<0.001), and South-South (OR=3.50, 95% C.I=2.82-4.34, p<0.001) than those in the South-West. Women living in the North-West (OR=0.64, 95% C.I=0.51-0.81, p<0.001) had lower risk, whereas the risk of experiencing less severe violence was found to be higher among other regions than those in the South-West. This pattern observed for less severe violence was observed for severe violence among the women across the regions in Nigeria. However, the risk of severe violence was particularly higher among women living in the North-Central (OR=2.06, 95% C.I=1.52-2.78, p<0.001), South-East (OR=3.46, 95% C.I=2.59-4.63, p<0.001), and South-South (OR=1.85, 95% C.I=1.32-2.58, p<0.001) than those in the South-West (Figure 5).

[Figure 5 is here]

The adjusted logistic regression model results of the relationship between the region and each domain of IPV was presented in Table 4. The data show that the pattern exhibited between the region and each domain of IPV at the bivariate regression barely changes when other relevant sociodemographic factors were included in the model. Compared to the South-West where the likelihood of IPV was relatively lower among the regions in Nigeria, the risk of sexual violence was 6.44(C.I=3.96-10.46, p<0.001), 3.60(C.I=2.17-5.95, p<0.001), 2.93(C.I=1.78-4.81, p<0.001), 2.59(C.I=1.57-4.24, p<0.001), and 1.71(C.I=1.02-2.86, p<0.05) higher in the North-East, South-South, South-East, North-Central, and North-West respectively. The likelihood of emotional violence was higher in the North-Central (aOR=4.21, C.I=3.14-5.64, p<0.001), North-East (aOR=7.11, C.I=5.14-9.84, p<0.001), North-West (aOR=3.71, C.I=2.67-5.16, p<0.001), South-East (aOR=3.40, C.I=2.35-4.91, p<0.001), and South-South (aOR=2.67, C.I=1.96-3.64, p<0.001) compared to South-West. A similar pattern to emotional violence was found for the relationship between the region and less severe violence.

Across the six regions in Nigeria, the risk of severe violence was only lower in the North-West (aOR=0.67, C.I=0.37-1.20, p>0.05) compared to the South-West, while the risk was significantly higher in other regions. The common factors predisposing married/cohabiting women to all spectrums of IPV include region, education, husband/partner drinks alcohol, and father bits mother of the respondents. The predictors of sexual violence were region, education, husband/partner's education, husband/partner drinking alcohol, and father bits mother of the respondent, whereas

that of the emotional violence were region, education, religion, ethnicity, number of living children, lifetime number of sexual partners, husband/partner drinks alcohol, and father bits mother of the respondent. Determinants of severe violence were region, education, religion, ethnicity, number of living children, husband/partner's level of education, decision-making power, lifetime number of sexual partners, husband/partner drinks alcohol, and father bits mother of the respondent.

[Table 4 is here]

The models presenting the relationship between the IPV and region are shown in Table 5. The data showed that IPV was higher in each of the regions in Nigeria than South-West after controlling for some socioeconomic and demographic characteristics. The mean IPV difference between the South-West and other regions was, North-Central (aβ=0.627, s.e=0.1012, p<0.001), North-East (aβ=1.020, s.e=0.1131, p<0.001), North-West (aβ=0.434, s.e=0.1146, p<0.001), South-East (aβ=0.810, s.e=0.1248, p<0.001), South-South (aβ=0.672, s.e=0.1080, p<0.001). This implies the risk of IPV was higher in each of the regions compared to the South-West. In the full model; the predictors of IPV are region, place of residence, level of education, religion, ethnicity, wealth index, and the number of living children. Others are the husband/partner's education level, household decision-making power, total lifetime number of sex partners, husband/partner drinks alcohol, and respondent's father ever beat her mother. The mean difference in IPV was significantly higher in the urban (aβ=0.190, s.e=0.0545, p<0.001) than in the rural area, lower among the Igbos (aβ=-0.381, s.e=0.1334, p<0.001) than Hausa/Fulani ethnic group, and lower among the Muslims (aβ=-0.329, s.e=0.0708, p<0.001) than Christians. The data further show that

the mean IPV was lower among women who had only one sexual partner (aβ=-0.244, s.e=0.0502, p<0.001) than those with at least two in their lifetime, also lower for women whose husbands do not drink alcohol (aβ=-0.909, s.e=0.0586, p<0.001).

[Table 5 is here]

4.0 Discussion

Intimate partner violence is a widespread phenomenon but often overlooked in the literature despite its serious consequences for the victims. It has remarkable negative consequences on women's health and quality of life, with a specific harmful impact on women's psychological well-being and sexuality (Barbara et al., 2022). This social depravity happens to people of all ages irrespective of their gender, ethnic, religious, and socioeconomic backgrounds. However, in most situations, women are more vulnerable to IPV than men. Nigeria is currently experiencing rising in the number of reported cases of IPV against women. The vast population of Nigerians and its ethnic/cultural diversities necessitate the need for the examination of IPV across the six regions in Nigeria. We, therefore, assessed the regional differences in the spectrum of IPV against women in Nigeria. The constituent of the spectrum includes sexual, emotional, less severe, severe, and overall IPV. Thus, the regional differences in each of these constituents were ascertained against the backdrop of limited research on this subject. We found that about one in three women of reproductive age had experienced IPV in their marriage or cohabitation in Nigeria. The outcome of this study corroborates findings from previous studies either conducted in Nigeria or elsewhere in sub-Saharan Africa (Bolarinwa et al., 2022; Aboagye et al., 2022). The proportion of women

who experienced IPV was highest in the South-East, then South-South, North-East, North-Central, North-West, and South-West in that order.

Emotional IPV is a form of IPV that includes acts such as insults, belittling, constant humiliation, intimidation, threats of harm, and threats to take away children (World Health Organization, 2020). Across the six regions in Nigeria, we found that emotional violence was the most prevalent form of IPV with the highest observed by the women living in the North-East and least in the South-West. Emotional violence as the most prevalent form of IPV found in this study is expected, since such violence leaves no physical harm on the victims and the perpetrator could invade justice if he smartly denies the incident. Previous studies have also reported emotional violence as the commonest form of IPV in other settings (Tenkorang, 2019; Adu, 2022). In this study, the region sustained its strength of relationship with emotional IPV even when other socioeconomic confounders were used as a control in the model. However, aside from region, other determinants of emotional violence identified were education, religion, ethnicity, number of living children, lifetime number of sexual partners, husband/partner drinks alcohol, and experience of the mother being beaten by father in childhood. These findings have been widely reported in the emotional violence literature (Alabi and Ramsden, 2022; Bolarinwa et al., 2022; Torres and Martínez-Zarzoso, 2022).

Although sexual violence was the least experienced form of IPV in Nigeria, its occurrence is remarkable in each of the six regions in Nigeria. Notwithstanding, variation existed across the regions but it occurred mostly among women living in the North-East, then South-South, and least in the South-West. The highest prevalence of sexual violence observed in the North-East could be

attributed to the insurgency in the region where people are displaced from their homes. Stress, trauma, collapse in business, and indolence may trigger unintended sexual acts among men. There is no doubt that men might perceive this as the only source of leisure amidst adversities in the region. The current realities in terms of environmental, psychological, and health conditions of women living in the region might prompt them to refuse their husband/partner sex. In such circumstances, an already arouse husband may result in forced sex thereby violating their right. The relatively most peaceful and socioeconomic advanced nature of the South-West region might account for the least observed prevalence of sexual IPV in the region. The study further revealed region, education, husband/partner's education, husband/partner drinks alcohol, and experience of the mother being beaten by father in childhood as the predictors of sexual violence in Nigeria. Earlier frameworks and studies have documented similar findings elsewhere (Shamu et al., 2018; Alabi and Ramsden, 2022; Bolarinwa et al., 2022).

IPV is a bad practice for both sex, but the IPV prevalence rates are high among both genders, women are more likely than men to report being victimized (Gass et al., 2013). The women's physiological conditions predispose them to higher risks of poor health outcomes resulting from IPV (Antai, 2011). When women experienced one or more cruel acts like kicking, dragging on the floor, strangling, burning, or threatening with weapons by their husband/partner, they are said to experience severe IPV (National Population Commission and ICF, 2019). In this study, such violence was found to be most prominent among women who reside in the South-East where it was experienced by one in five women aged 15-49 years, and least among women living in the North-West where nearly two percent reported severe IPV. Meanwhile, the severe IPV was about the same in the North-Central and South-South where approximately one-tenth of women

experienced severe IPV. These findings are in agreement with previous studies conducted in Nigeria (Alabi and Ramsden, 2022; Bolarinwa et al., 2022; Adu, 2022). Generally, polygamy is a common marriage practice in the core Northern regions, North-West inclusive, while the South-East mainly practices monogamy. There is the possibility that conflicts may be more dominant among wives rather than between husband and wives in polygamous families due to competition for limited family resources among wives, unlike in monogamous families (Ahinkorah, 2021). The huge dowry paid by men as part of marriage rights and strong adherence to men's control power over women which are common practices in the South-East can predispose women to higher severe violence than in other regions in Nigeria. This assertion was in line with a study conducted in Pakistan which showed that a dowry provision was not protective from physical, sexual, or psychological violence (Ali et al., 2021). Besides, in this study, severe IPV was higher among Christians (12.1 percent) which is the mainly practiced religion in the South-East than Islam (4.4 percent) which dominates North-West. These distinct attributes between women in the South-East and North-West can probably explain the striking difference in severe IPV between women in these regions. Aside from region, other key determinants of severe IPV among women in Nigeria some of which had been established in the literature (Alabi and Ramsden, 2022; Bolarinwa et al., 2022; Ahinkorah, 2021) included education, religion, ethnicity, number of living children, husband/partner's level of education, decision making power, lifetime number of sexual partners, husband/partner drinks alcohol, and experience of the mother being beaten by father at childhood.

The data further showed that the risk of IPV was higher in each of the regions when compared to the South-West. In order of severity of IPV, the risk of IPV was highest in the North-East, then South-East, South-South, North-Central, North-West, and least in the South-West. The insurgency

which has lasted for a decade in the North-East and unrest activities in the South-East could explain the reasons why men indulge in violent behavior toward their spouses in the regions. Among the analyzed independent variables; age, media access, marital duration, and work status were not significantly related to IPV. The important socioeconomic determinants of IPV found in this study are region, place of residence, level of education, religion, ethnicity, wealth index, and the number of living children. Others are the husband/partner's education level, household decision-making power, total lifetime number of sex partners, husband/partner drinking alcohol, and experience of the mother being beaten by the father in childhood. The determinants have also been established in other studies in Nigeria and elsewhere (Alabi and Ramsden, 2022; Bolarinwa et al., 2022; Adu, 2022). Living in an urban area, being a Christian, having more than one-lifetime sexual partner, husband/partner drinking alcohol, and exposure to IPV against the mother predispose women to IPV in Nigeria. The finding is consistent with the outcome of earlier studies (Kishor and Johnson, 2004; Izugbara, 2020).

4.1 Policy implications of findings

The research outcomes have the potential to inform the policymakers to design effective policies and increase awareness and capacity to eradicate IPV in Nigeria. This study creates regional-specific knowledge and evidence to promote an effective response to eradicate IPV through appropriate actions by policymakers. The outcomes advocate action for raising public awareness and drive policy and legislation that will curtail IPV in Nigeria. Media and advocacy campaign programs to raise awareness about behavioral change in IPV from a regional perspective will reduce IPV in most affected regions in Nigeria. Eradicating IPV from Nigeria will expunge from the society its physical, social, and economic impacts including personal injuries/disabilities,

unwanted pregnancy, sexually transmitted infections, absenteeism from work/school, and school drop-out. Some hidden insights and ambiguity in the national estimate of each component of the IPV spectrum were discovered in easy-to-recognize visual patterns and images through regional analysis.

4.2 Limitations

The data used for this study was not originally collected for this research purpose, but the sampling design and robustness paved way for the accomplishment of the study's objectives. There is no doubt that the measurement of each of the IPV spectrums might require more context-specific variables which were not included in the study. However, the measurement approach used in this study is based on the best practices and international standards. In any setting, women are susceptible to violation by intimate partners irrespective of their age. The current study was based on data collected from women aged 15-49 years only. Therefore, the prospective readers of this article should interpret the findings with caution. The study did not explore the roles and capacities of stakeholders for the elimination of IPV and the traditional protection structure in place to prevent IPV and provide justice to the victims in each region in Nigeria. Therefore, qualitative research is strongly suggested to fill in the research gap in these areas.

4.3 Conclusions

The level of IPV and its spectrum is high in Nigeria, but prominent disparities existed between the regions with North-East and South-East mostly affected. Emotional violence and sexual violence was the most and least experienced form of IPV in Nigeria respectively. However, these forms of IPV occur mostly in the North-East and least in the South-West. Severe violence was mostly

protuberant among women living in the South-East region, but least in the North-West. Region of residence, level of education, husband/partner drinking alcohol, and father beats mother of the respondents are predictors common to all the spectrum of IPV in Nigeria. Therefore, these findings call for the policymakers to draw regional-specific programs aimed at mitigating IPV in Nigeria. Qualitative research is needed to explore contextual factors influencing severe violence in Nigeria, particularly in the South-Eastern part where the prevalence was highest compared to other regions in Nigeria.

Abbreviations

IPV: Intimate Partner Violence; LGA: Local Government Area

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Author contributions

[1,2]Adebowale Ayo Stephen (AAS) conceived the research idea and produed the plan for the study. AAS, [1]Fagbamigbe Francis Adeniyi (FFA), [2]Palamuleni Martin Enoch (PME), and [1]Fawole Olufunmilayo Ibitola (FOI) wrote the introduction and method section. AAS and FFA conducted the data analysis and interpretation. PME and FOI wrote the discussion section while AAS produced the draft of the paper. All authors revised and approved the final draft. AAS is the guarantor of the paper.

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Availability of data and materials

The datasets generated and/or analyzed during the current study are available in the DHS program Demographic and Health Survey repository, [https://dhsprogram.com/data/available-datasets.cfm]

Declarations:

Ethics approval and consent to participate

I confirm that all experiments were performed in accordance with relevant guidelines and regulations. Secondary data was used for this study and as such, permission to use the data was sought and granted by the data originator. However, ethical approval to conduct the study was obtained from the National Ethical Review Committee (NREC) and at the point of data collection, informed consent was also obtained from the respondents before the conduct of interview. The respondents were assured of the anonymity of the information they provided. The possible identifier that could be used to track each respondent to the information they provided were removed from the original data**.**

Consent for publication

Not applicable

Competing interests

The authors declared no competing interest.

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Figure 1: Map of Nigeria showing the six regions and states

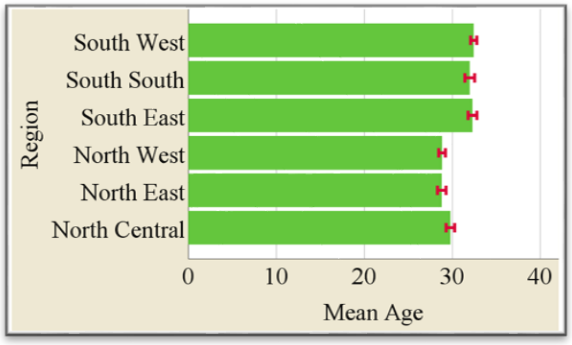

Figure 2a: Mean Age (years) of women by region

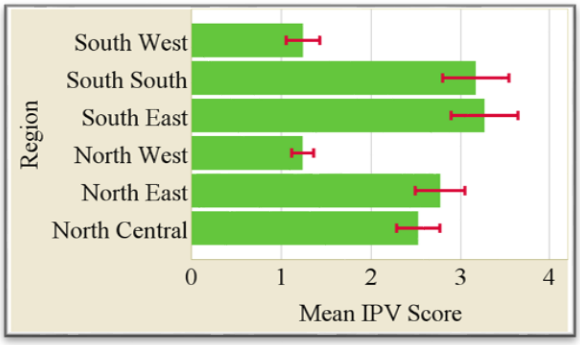

Figure 2b: Mean IPV Score of women by region

Figure 2: Mean age and IPV score of women by regions in Nigeria

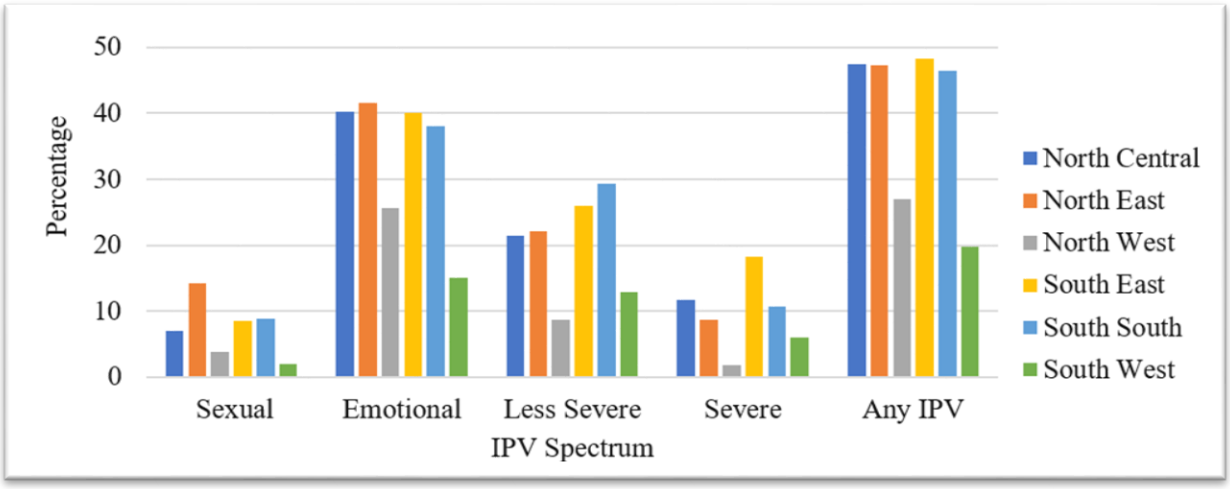

Figure 3: Percentage Distribution of women by spectrum of intimate partner violence according to the six regions in Nigeria

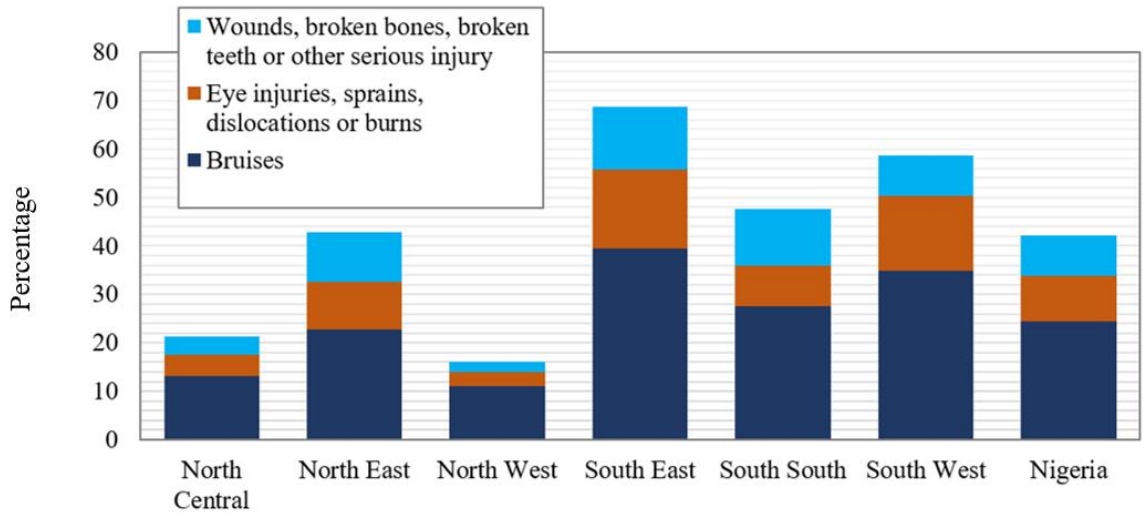

Figure 4: Percentage distribution of women who had experienced IPV by region according to the type of injury sustained during the encounter

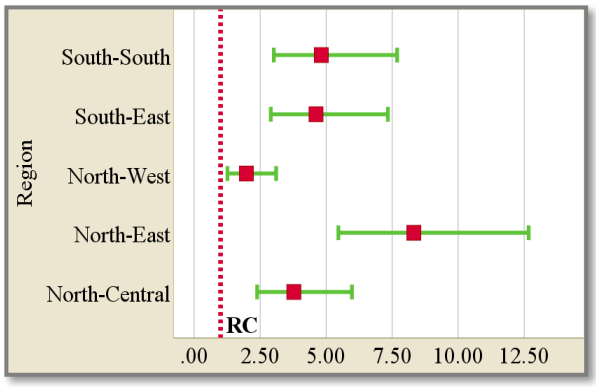

Figure 5a: Sexual Violence

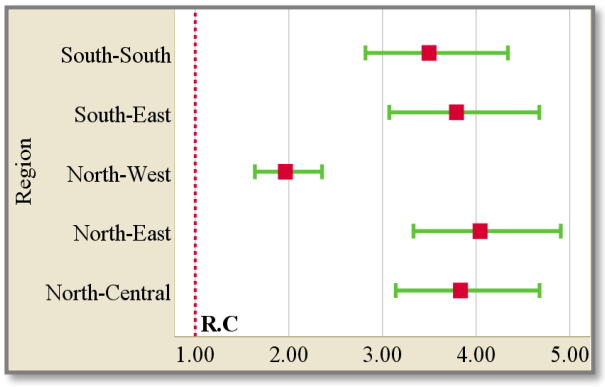

Figure 5b: Emotional Violence

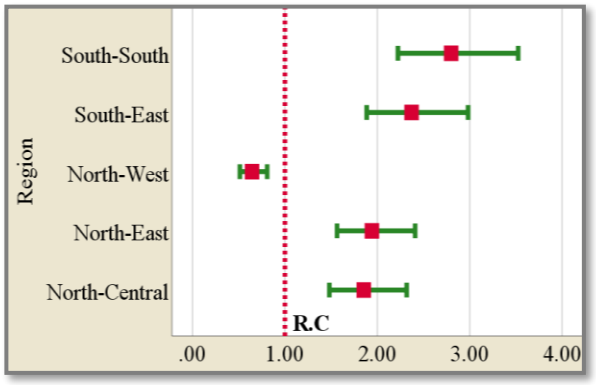

Figure 5c: Less Severe Violence

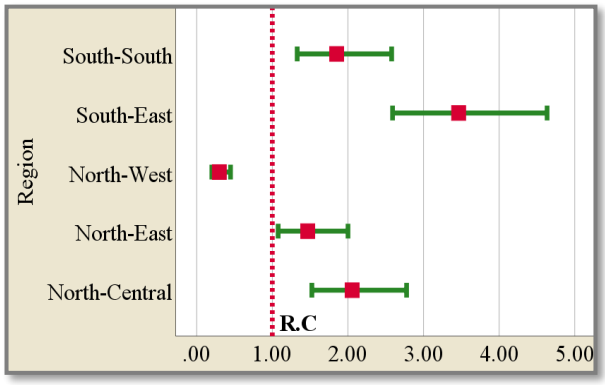

Figure 5d: Severe Violence

Figure 5: Unadjusted Odds Ratio of the Relationship between Region and Spectrum of Intimate Partner Violence in Nigeria

Table 1: Questions used for the generation of IPV Domains

Variables	No	Yes
a. Ever been humiliated by husband/partner	0	1
b. Ever been threatened with harm by husband/partner	0	1
c. Ever been insulted or made to feel bad by husband/partner	0	1
d. Ever been pushed, shook or had something thrown by husband/partner	0	1
e. Ever been slapped by husband/partner	0	1
f. Ever been punched with fist or hit by something harmful by husband/partner	0	1
g. Ever had arm twisted or hair pulled by husband/partner	0	1
h. Ever been kicked or dragged by husband/partner	0	1
i. Ever been strangled or burnt by husband/partner	0	1
j. Ever been threatened with knife/gun or other weapon by husband/partner	0	1
k. Ever been physically forced into unwanted sex by husband/partner	0	1

l. Ever been forced into other unwanted sexual acts by husband/partner	0	1
m. Ever been physically forced to perform sexual acts respondent didn't want to	0	1
Overall Score	**0**	**13**

Table 2: Percentage distribution of women by the spectrum of intimate partner violence according to demographic characteristics

Demographic Characteristics	Spectrum of IPV				IPV	Total women
	SV	EM	LS_{ev}	S_{ev}		
Total	**6.6(430)**	30.9(2026)	17.5(1147)	7.9(520)	35.9(2359)	6562
Age	**5.89**	**19.4***	**16.8***	**25.0***	**19.4***	
15-24	7.9(117)	26.4(392)	14.0(208)	4.8(72)	31.2(464)	1487
25-34	6.0(180)	32.8(987)	18.1(547)	8.8(266)	37.8(1139)	3013
35-49	6.5(133)	31.4(647)	19.0(392)	8.8(182)	36.7(756)	2062
Region	**180.5***	**323.2***	**245.7***	**232.8***	**408.6***	
North Central	7.0(64)	40.3(368)	21.5(196)	11.7(107)	47.4(433)	913
North East	14.2(148)	41.6(432)	22.2(231)	8.7(90)	47.3(492)	1039
North West	3.8(70)	25.7(476)	8.7(161)	1.9(35)	27.0(500)	1851
South East	8.5(62)	40.1(293)	25.9(189)	18.3(134)	48.3(353)	731
South South	8.9(59)	38.1(254)	29.3(195)	10.7(71)	46.5(310)	666
South West	2.0(27)	15.0(204)	12.9(175)	6.1(83)	19.8(270)	1361
Residence	**14.3***	**27.6***	**0.59**	**2.67**	**17.2***	

Urban	5.3(156)	27.6(815)	17.1(505)	8.5(252)	33.2(982)	2956
Rural	7.6(274)	33.6(1211)	17.8(642)	7.4(268)	38.2(1376)	3605
NOLC	**13.6****	**45.5***	**28.1***	**31.1***	**48.1***	
0-2	5.9(167)	26.5(745)	14.6(411)	5.9(165)	31.2(878)	2813
3-4	5.8(121)	33.5(694)	19.7(409)	8.9(185)	39.1(810)	2072
5+	8.5(142)	35.0(587)	19.5(327)	10.2(171)	40.0(670)	1677
Marital Duration	**8.3**	**29.7***	**15.1****	**17.5****	**31.1***	
0-4	6.8(99)	25.9(375)	14.3(207)	5.5(80)	31.0(448)	1447
5-9	5.2(85)	30.0(492)	17.8(292)	8.2(134)	35.2(577)	1639
10-14	7.2(89)	34.8(430)	19.7(243)	9.0(111)	40.9(505)	1236
15-19	6.3(61)	33.4(325)	17.6(171)	9.7(94)	38.1(370)	973
20+	7.6(96)	31.9(405)	18.4(233)	7.9(100)	36.2(459)	1268
H/P's Age	**4.30**	**5.32**	**6.23**	**8.96*****	**4.99**	
15-24	8.6(15)	26.6(46)	19.1(33)	2.9(5)	31.6(55)	174
25-34	6.5(122)	29.5(551)	16.7(311)	7.2(134)	35.0(652)	1865
35-44	6.0(159)	31.0(827)	16.7(445)	8.5(226)	35.7(951)	2668
45+	7.3(135)	32.5(603)	19.2(357)	8.4(155)	37.8(701)	1857
LTSP	**0.302**	**12.3***	**75.3***	**52.2***	**24.1***	
1	6.4(260)	29.3(1187)	14.3(578)	6.0(244)	33.7(1363)	4050
2+	6.8(170)	33.4(840)	22.6(569)	11.0(276)	39.6(996)	2513

NOLC: Number of living children; LTSP: Life time number of sexual partners; *p<0.001; **p<0.01; ***p<0.05

Table 3: Percentage distribution of women by a spectrum of intimate partner violence according to socioeconomic characteristics

Socioeconomic Characteristics	**Spectrum of IPV**				**IPV**	**Total Women**
	SV	**EM**	**LS_{ev}**	**S_{ev}**		
Total	**6.6(430)**	30.9(2026)	17.5(1147)	7.9(520)	35.9(2359)	6562
Education	**33.0***	**42.7***	**58.1***	**72.6***	**49.4***	
None	7.8(193)	31.2(769)	15.1(373)	5.9(145)	35.0(861)	2463
Primary	6.9(71)	35.6(364)	21.7(222)	12.8(131)	40.1(411)	1023
Secondary	6.5(153)	31.4(742)	20.2(477)	9.3(220)	38.4(906)	2362
Higher	1.8(13)	21.1(151)	10.5(75)	3.5(25)	25.4(181)	714
Religion	**0.801**	**68.4***	**170.3***	**131.7***	**107.1***	
Christian	6.7(199)	35.7(1057)	24.0(711)	12.1(359)	42.5(1259)	2964
Muslim	6.4(230)	26.7(952)	11.9(425)	4.4(158)	30.4(1083)	3566
Others	3.1(1)	53.1(17)	35.5(11)	12.5(4)	53.1(17)	32
Ethnicity	**43.1***	**182.7***	**194.1***	**149.0***	**236.9***	
Hausa/Fulani	7.2(170)	27.7(653)	10.0(236)	3.1(74)	30.2(713)	2360
Igbo	7.4(74)	35.4(356)	23.7(238)	14.2(143)	43.6(438)	1006
Yoruba	2.1(24)	17.7(198)	14.8(165)	7.5(84)	22.5(252)	1118

Others	7.7(161)	39.4(819)	24.4(508)	10.6(220)	46.0(955)	2078
Wealth Index	**33.6***	**37.3***	**3.49**	**8.61*****	**24.5***	
Poor	8.3(161)	32.3(626)	16.4(319)	6.6(129)	36.4(706)	1940
Middle	7.6(156)	34.8(710)	18.7(381)	9.2(187)	39.7(809)	2041
Rich	4.4(113)	26.7(690)	17.3(447)	7.9(204)	32.7(843)	2582
Media Access	**24.4***	**19.0***	**2.99**	**7.82*****	**8.10*****	
None	8.0(165)	31.5(653)	16.9(351)	7.2(149)	36.0(745)	2072
Low	7.0(191)	33.0(895)	18.4(500)	9.0(245)	37.6(1019)	2713
High	4.2(74)	26.9(479)	16.6(296)	7.1(126)	33.4(594)	1778
H/P education	**28.6***	**38.5***	**72.5***	**56.1***	**61.4***	
None	8.4(155)	30.0(555)	14.2(262)	5.9(109)	33.5(619)	1850
Primary	7.5(69)	36.5(334)	23.0(210)	11.6(106)	43.4(396)	914
Secondary	6.1(157)	32.3(833)	20.3(524)	9.5(245)	38.4(989)	2577
Higher	3.6(41)	24.5(276)	11.9(134)	4.4(50)	28.4(320)	1127
Don't know	8.4(8)	30.9(29)	17.9(17)	10.6(10)	36.8(35)	94
Work status	**0.14**	**11.8****	**9.59****	**16.2***	**27.2***	
No	6.7(130)	27.8(538)	15.2(294)	5.8(113)	31.2(602)	1932
Yes	6.5(300)	32.2(1489)	18.4(852)	8.8(407)	37.9(1757)	4631
DMP	**2.28**	**7.43*****	**44.8***	**32.7***	**21.8***	
None	6.7(137)	28.6(589)	12.9(266)	5.1(106)	31.9(656)	2060
Low	7.0(175)	32.0(801)	19.0(476)	9.6(240)	38.0(949)	2500
High	5.9(118)	31.8(637)	20.3(406)	8.7(174)	37.6(753)	2003
H/P drinks alcohol	**31.8***	**276.2***	**373.4***	**297.7***	**321.2***	
No	5.6(280)	25.6(1281)	12.4(622)	4.7(236)	30.0(1503)	5005
Yes	9.6(150)	47.9(745)	33.7(525)	18.2(284)	55.0(856)	1556
FEBRM	**132.3***	**318.9***	**280.5***	**143.2***	**348.2***	
No	5.1(282)	26.6(1474)	14.2(785)	6.3(349)	31.3(1732)	5541
Yes	13.0(91)	57.7(403)	38.0(265)	18.9(132)	64.4(450)	698
Don't know	17.6(57)	46.4(150)	30.0(97)	12.1(39)	54.8(177)	323

H/P: Husband/Partner; DMP: Decision making power; FEBRM: Father ever beats respondent's mother; *p<0.001; **p<0.01; ***p<0.05

Table 4: Multivariate Analysis of the Relationship between Region and Spectrum of Intimate Partner Violence in Nigeria

Background Characteristics	**SV**	**EM**	**LS_{ev}**	**S_{ev}**
	aOR(95% CIOR)	**aOR(95% CIOR)**	**aOR(95% CIOR)**	**aOR(95% CIOR)**
Region				
North Central	2.59(1.57-4.24)*	4.21(3.14-5.64)*	2.07(1.49-2.86)*	2.59(1.64-4.06)*
North East	6.44(3.96-10.46)*	7.11(5.14-9.84)*	3.62(2.52-5.18)*	2.75(1.64-4.61)*
North West	1.71(1.02-2.86)***	3.71(2.67-5.16)*	1.46(0.99-2.14)	0.67(0.37-1.20)
South East	2.93(1.78-4.81)*	3.40(2.35-4.91)*	2.01(1.34-3.01)**	5.54(3.06-10.01)*
South South	3.60(2.17-5.95)*	2.67(1.96-3.64)*	2.37(1.69-3.33)*	1.94(1.19-3.16)**
South West	1.00	1.00	1.00	1.00
Age				
15-24		1.00	1.00	1.00
25-34		1.19(0.99-1.42)	0.95(0.75-1.18)	1.18(0.84-1.67)
35-49		1.05(0.82-1.33)	0.83(0.62-1.10)	0.89(0.57-1.37)
Residence				
Urban	1.00	1.00		
Rural	0.89(0.68-1.15)	0.98(0.85-1.14)		

Education				
None	1.00	1.00	1.00	1.00
Primary	2.42(1.19-4.91)***	1.41(1.03-1.94)***	1.98(1.36-2.88)*	2.35(1.30-4.23)**
Secondary	2.37(1.19-4.71)***	1.49(1.11-2.00)**	1.82(1.28-2.57)**	2.78(1.62-4.75)*
Higher	2.79(1.49-5.21)**	1.38(1.07-1.77)***	1.61(1.18-2.17)**	1.90(1.17-3.09)**
Religion				
Christian	1.00	1.00	1.00	1.00
Muslim	1.18(0.82-1.68)	0.68(0.55-0.83)*	0.67(0.52-0.84)*	0.60(0.43-0.83)**
Others	0.18(0.01-2.30)	1.45(0.66-3.15)	1.29(0.57-2.88)	0.69(0.22-2.19)
Ethnicity				
Hausa/Fulani		1.00	1.00	1.00
Igbo		0.58(0.40-0.83)**	1.08(0.71-1.63)	0.65(0.34-1.22)
Yoruba		0.98(0.71-1.37)	1.95(1.32-2.87)**	2.22(1.28-3.84)**
Others		0.86(0.70-1.06)	1.28(0.98-1.65)	1.11(0.74-1.63)
Household Wealth				
Poor	1.37(0.93-2.01)	1.11(0.89-1.38)		0.84(0.59-1.19)
Middle	1.33(0.97-1.81)	1.14(0.96-1.35)		0.97(0.74-1.27)
Rich	1.00	1.00		1.00
Media Access				
None	0.95(0.65-1.38)	0.82(0.66-1.01)		1.21(0.86-1.69)
Low	1.12(0.82-1.53)	0.97(0.82-1.15)		1.17(0.89-1.52)
High	1.00	1.00		1.00
No of living children				
0-2	1.00	1.00	1.00	1.00
3-4	0.93(0.72-1.19)	1.29(1.09-1.51)**	1.32(1.08-1.59)*	1.27(0.96-1.67)
5+	1.23(0.95-1.57)	1.31(1.07-1.58)**	1.36(1.07-1.71)***	1.58(1.14-2.17)**
Marital Duration				
0-4		1.00	1.00	1.00
5-9		1.09(0.90-1.32)	1.19(0.94-1.49)	1.28(0.91-1.79)
10-14		1.14(0.91-1.41)	1.22(0.93-1.58)	1.23(0.83-1.81)
15-19		1.07(0.83-1.35)	1.06(0.78-1.42)	1.43(0.93-2.19)
20+		0.99(0.77-1.28)	1.29(0.94-1.75)	1.41(0.88-2.26)
Husband/Partner's education				
None	1.00	1.00	1.00	1.00
Primary	0.81(0.56-1.17)	1.14(0.92-1.41)	1.17(0.90-1.51)	0.76(0.52-1.10)
Secondary	0.71(0.50-0.99)***	1.01(0.83-1.23)	0.95(0.75-1.20)	0.70(0.49-0.99)***
Higher	0.66(0.41-1.05)	0.91(0.70-1.16)	0.74(0.54-1.00)	0.54(0.34-0.86)**
Don't know	1.08(0.49-2.37)	1.03(0.63-1.66)	1.31(0.73-2.34)	1.67(0.79-3.51)
Work status				
No		1.00	1.00	1.00
Yes		1.13(0.98-1.30)	0.82(0.69-0.98)***	0.87(0.67-1.12)
Age of the husband				
15-24				1.00
25-34				1.50(0.59-3.81)
35-44				1.41(0.54-3.67)
45+				1.34(0.49-3.60)
Decision making power				
None		1.00	1.00	1.00
Low		1.10(0.95-1.27)	1.33(1.10-1.60)**	1.39(1.06-1.82)***
High		0.96(0.81-1.14)	1.14(0.92-1.41)	0.86(0.63-1.16)
LTNSP				

1		1.00	1.00	1.00
2+		1.25(1.08-1.43)**	1.37(1.16-1.59)*	1.40(1.13-1.73)**
Husband/Partner drinks alcohol				
No	1.00	1.00	1.00	1.00
Yes	2.14(1.60-2.87)*	2.78(2.37-3.25)*	2.64(2.22-3.13)*	2.75(2.17-3.46)*
Father ever beats respondent's mother				
No	1.00	1.00	1.00	1.00
Yes	2.17(1.66-2.84)*	2.93(2.46-3.49)*	2.60(2.16-3.13)*	2.31(1.81-2.93)*
Don't know	3.12(2.24-4.33)*	1.97(1.54-2.51)*	1.97(1.50-2.57)*	1.43(0.98-2.09)

LTNSP: Life time number of sexual partner; *p<0.001; **p<0.01; ***p<0.05

Table 5: Generalized Linear Regression Model of the Relationship between Region and Intimate Partner Violence in Nigeria

Background	**Model 1**		**Model 2**		**Model 3**		**Full Model**	
Characteristics	**uβ**	**S.E(uβ)**	**aβ**	**S.E(aβ)**	**aβ**	**S.E(aβ)**	**aβ**	**S.E(aβ)**
Region								
North Central	0.667*	0.0770	0.635*	0.0814	0.619*	0.1008	0.627*	0.1012
North East	0.711*	0.0743	0.654*	0.0815	1.021*	0.1127	1.020*	0.1131
North West	0.015	0.0646	-0.039	0.0734	0.429*	0.1140	0.434*	0.1146
South East	1.026*	0.0814	0.980*	0.0816	0.857*	0.1248	0.810*	0.1248
South South	0.885*	0.0859	0.878*	0.0875	0.655*	0.1075	0.672*	0.1080
South West	0[a]		0[a]		0[a]		0[a]	
Age								
15-24			0.075	0.0881			0.088	0.0875
25-34			0.091	0.0619			0.106	0.0595
35-49			0[a]				0[a]	
Residence								
Urban			0.003	0.0509			0.190*	0.0545
Rural			0[a]				0[a]	
Education								
None					0.454*	0.1118	0.398*	0.1138

Primary			0.547*	0.1039	0.485*	0.1055
Secondary			0.348*	0.0854	0.324*	0.0861
Higher			0[a]		0[a]	
Religion						
Christian			0[a]		0[a]	
Muslim			-0.283*	0.0705	-0.329*	0.0708
Others			-0.213	0.3124	-0.217	0.3115
Ethnicity						
Hausa/Fulani			0[a]		0[a]	
Igbo			-0.341	0.1332	-0.381**	0.1334
Yoruba			0.170	0.1169	0.137	0.1169
Others			-0.083	0.0796	-0.090	0.0795
Household Wealth						
Poor			0.051	0.0771	0.144	0.0809
Middle			0.105	0.0626	0.156***	0.0644
Rich			0[a]		0[a]	
Media Access						
None			-0.094	0.0758	-0.068	0.0758
Low			-0.036	0.0604	-0.030	0.0603
High			0[a]		0[a]	
No of living children						
0-2	-0.351*	0.0748			-0.332*	0.0723
3-4	-0.168**	0.0648			-0.173**	0.0619
5+	0[a]				0[a]	
Marital Duration						
0-4	-0.132	0.0959			-0.040	0.0930
5-9	-0.033	0.0841			0.039	0.0811
10-14	-0.002	0.0805			0.026	0.0770
15-19	-0.020	0.0783			-0.019	0.0746
20+	0[a]				0[a]	
Husband/Partner's education						
None			0[a]		0[a]	
Primary			0.062	0.0791	0.046	0.0791
Secondary			-0.121	0.0729	-0.115	0.0728
Higher			-0.225	0.0921	-0.219**	0.0920
Don't know			0.103	0.1826	0.127	0.1821
Work status						
No			-0.017	0.0514	0.016	0.0523
Yes			0[a]		0[a]	
Decision making power						
None			0.022	0.0633	0.032	0.0632
Low			0.155**	00.0538	0.162**	0.0537
High			0[a]		0[a]	
LTNSP						
1			-0.239*	0.0500	-0.244*	0.0502
2+			0[a]		0[a]	
Husband/Partner drinks alcohol						
No			-0.917*	0.0588	-0.909*	0.0586
Yes			0[a]		0[a]	
Father ever beats respondent's mother						
No			0[a]		0[a]	

Yes			1.028	0.0705	1.035*	0.0704
Don’t know			0.622	0.0992	0.635*	0.0990
LogLikelihood	*-13546.165*	*-13519.847*	*-13170.032*		*-13145.892*	
Akaike's IC	*27106.331*	*27071.694*	*26400.063*		*26369.784*	
Bayesian IC	*27154.016*	*27180.690*	*26604.431*		*26635.462*	

a. Set to zero because this parameter is redundant; LTNSP: Life time number of sexual partner; IC: Information Criteria; *p<0.001; **p<0.01; ***p<0.05