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Physical violence among intimate partners in Nigeria: A multi level analysis

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Gender based violence is gaining more and more recognition, the world over. The prevalence and factors associated with physical violence as it affects both men and women taking into account the hierarchical nature of the data was reported in this study. A descriptive cross sectional survey was carried out on adult women and men in three selected states of Nigeria. A random effect logistic model was fitted. More female respondents had experienced physical violence compared with males. Behavioural factors of partners were found to greatly influence domestic violence against females such as young age and partner's smoking and drinking status. These results would provide more insights into the determinants of violence in developing country settings.

Key words: Physical violence, intimate partners, multilevel analysis, determinants.

INTRODUCTION

Violence among both men and women is a universal problem in many countries. Physical violence in particular is very common among intimate partners in both developed and developing countries. Physical violence is the intentional use of physical force with the potential for causing death, disability, injury or harm. Physical violence includes but is not limited to, scratching, pushing, shoving, throwing, grabbing, biting, choking, shaking, slapping, punching, burning, use of a weapon and use of restraints or ones' body size, or strength against another person (United States Department of Health and Human Services. 2007). Physical violence occurs across society, regardless of age, gender, race, sexuality, wealth and geography. It affects both males and females in an intimate relationship in form of threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or private life (United Nations, 1993).

Around the world, at least one out of three women is beaten, coerced into sex or otherwise abused during her lifetime. Most often, the abuser is a member of her own family (WHO, 2004). UNFPA (2002) reports that more than 60% of women worldwide have been abused. In 48 population-based surveys around the world, 10 to 69% of the women reported assault by an intimate partner (Krug et al., 2002). In addition, the prevalence of violence during pregnancy ranges from 4 to 20% in developing countries (Nasir et al., 2003).

Most issues of gender based domestic violence has been centred on men as the perpetrators of domestic violence, however, this is not to deny that cases of men being victims of domestic violence do exist. Men can be, and frequently are, also victims of abuse in the home at the hands of their female partners. A study by researchers with the Centres for Disease Control in 2007, found that women are slightly more likely to be victimized in non-reciprocal violence, whereas men are slightly more likely to be victimized in reciprocal violence. The study also found that almost three quarters of non-reciprocal violence is perpetrated by women. In a similar study, women are more likely to be injured in non-reciprocal violence and men are more likely to be injured in reciprocal violence (Tjaden and Thoennes, 2000). The great reluctance of many men and boys to report domestic violence makes it very difficult to accurately assess its scope worldwide. The dearth of such statistics

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certainly leads to the under- estimation of the number of male victims.

The war against gender based violence is hampered by the lack of adequate data to accurately estimate its incidence and its impact on health, and also prevents efforts to present the issues in a broader perspective. A greater understanding of these issues is necessary for the development of interventions necessary to curb the menace.

The most extensively conducted study on gender violence was the World Health Organisation's multi-country study on women's health and domestic violence against women which involved more than 24,000 women in ten countries around the world. The study revealed that gender based domestic violence seriously affects women's health and the level of violence varied greatly both within and between countries (W.H.O Summary report, 2005).

This study aims to strengthen the research on gender based violence with emphasis on physical violence among men and women in intimate relationships. The study also reports the prevalence and factors associated with physical violence taking into account the hierarchical nature of the data.

METHODS

A descriptive cross sectional study was carried out on adult women and men in three selected states of Nigeria. The minimum sample size required to determine level of domestic violence at a 5% level of significance with a 90% power and a 5% error tolerable was calculated and a minimum sample size of 989 was arrived at which was increased to 1000 per state. A multi stage cluster sampling procedure was employed. The 6 geo-political zones of Nigeria were identified as clusters. Stage 1 involved the random selection of 3 geo political zones from a list of the 6 geo political zones in the country. This resulted in the selection of south west, north central and south east zones. Stage 2 involved the random selection of one state in each of the selected zones with the selection of Oyo, Enugu and Kaduna States. At each selected state, one adult woman or man was randomly selected from each household in selected communities. The adult man or woman must have been or is still in a relationship.

Oyo state is a state in the south-western Nigeria with its capital at Ibadan. Enugu state is inland in South-eastern Nigeria with its capital at Enugu, while Kaduna State is located in the north central with its capital in Kaduna. Variations exist in these states on certain characteristics (socio demographic, violence and other behavioural) especially age at marriage. For example, in Northern Nigeria, age at marriage is lower compared with other places (NDHS, 2003)

Information concerning social and demographic characteristics, alcohol and smoking status, attitudes and perceptions toward gender and relationships of each participant were collected using structured questionnaires.   Questions derived from a thorough literature review including the WHO Multi-Country Study of Violence against Women were adapted for use in this study (WHO, 2004). Research assistants and coordinators participated in a 1-day training session that focused on the basic skills of data collection and contents of the questionnaire.

Descriptive statistics such as means and standard deviations were used to summarise quantitative variables while qualitative variables were summarised by proportions and percentages.

Multilevel logistic regression analysis was carried out using a hierarchical model that included fixed effects and group level intercepts as random effects to investigate associations between the outcome and independent variables (Bryk and Raudenbush, 1992; Snijders and Bosker, 1999). Odds ratios and 95% confidence intervals were generated. Our data presents a clear multilevel structure with individuals (level 1) nested within regions (level 2). We conducted a two level hierarchical logistic model analysis using gllamm module in stata. All analysis was done with stata 10.0.

Outcome variable

The outcome variable considered in this analysis was physical violence. Physical violence was determined from the response to questions asking whether the respondent had experienced at least one of the 17 subtypes of physical violence (that is, slap on the face, throwing something at one, pushing, biting, tying up, pulling one's hair, beaten up, hit with an object, burning/acid attack, choking, stabbing, thrown out, kicks on the body, shoving, dragging, knife threat and gun threat) on which information was collected, relating to physical violence.

Explanatory variables

The choice of variables for the identification of risk factors was based on previous published studies and literature reviews on gender-based violence (Heise, 1998; Hindin and Adair, 2002; Jewkes et al., 2002; Karamagi et al., 2006). The explanatory variables used in the analysis include age, current marital status, alcohol intake, smoking status of respondents, smoking and drinking status of partner, partner's level of education and age of partner.

The multilevel logistic model of physical violence

In this analysis, a multilevel statistical approach was used to model the relation between physical violence and the explanatory variables. Two levels of data hierarchy were stated (individual and region) in a multilevel logistic regression model.

Let π_{ij} be the predicted probability of experiencing physical violence for the ith individual in the jth region. The logit function becomes log (π_{ij} / 1-π_{ij}). The model is a 2-level form, with individuals (level 1) nested within their region (level 2):

$$\text{logit}(p_{ij}) = x_{ij}\beta + \mu_j$$

where p_{ij} is the probability of experiencing the outcome for the ith respondent in the jth region, x_{ij} is a vector of covariates corresponding to the ith respondent with the jth region, β is a vector of unknown parameters, and μ_j is the random effect at the region level.

Here, the random part of the logistic model is partitioned among an individual level variance (which is set to be binomial) and region level variance. Therefore, the multilevel logistic model for males in this analysis is given by:

Logit (Pr (Y_{ij} = 1 │ X_{ij}, Ui) = b_0 + $b_1$drinking status + $b_2$smoking status + $b_3$marital status + $b_4$partner's age + b5partner's education + U_i +U_v

$U_i \sim N (0, \tau^2)$.

$U_v \sim N (0, \tau^2)$

For females it is:

Logit (Pr $(Y_{ij} = 1 \mid X_{ij}, U_i)$) = $b_0 + b_1$age + $b_2$drinking status + $b_3$marital status + $b_4$partner's smoking status + $b5$partner's drinking status + $U_i + U_v$

$U_i \sim N(0, \tau^2)$.

$U_v \sim N(0, \tau^2)$

where U_i is the variation between geographical regions.

It is assumed to be a random variable with a mean of zero and constant variance. The distribution of the regional effect (U_i), is the estimation of the variance across all regions involved in the study. If the variance is large then the outcome of interest is dependent on the region; if the variance is small then the variations in outcome of interest may be explained by the measured characteristics alone. In this simple two level model, the sources of variance are within-regions and between regions. Since respondents were sampled from regions, the total variation in outcomes can be partitioned into two variance components: within-regions variance (that is, variance among respondents in the same region) and between regions variance (that is, variance between respondents in different regions).

We assumed further that given U_i, the responses from the same region are mutually independent, that is, the correlation between respondents from the same region is completely explained by them having been observed in the same region. The interpretation is also analogous to the conventional logistic regression model. The transformed regression coefficients exp (b) is the odds of experiencing physical violence for a respondent compared to the respondent who does not experience physical violence. The variance τ^2 measures the degree of heterogeneity in the probability of experiencing violence that cannot be explained by the classification into the 2 categories (physical violence Vs non physical violence)

An important measure that describes these dependences in the data is called the intra-class correlation coefficient (ICC); this statistic measures the extent to which individuals within the same group are more similar to each other than they are to individuals in different groups. The intraclass correlation (ICC), ρ was calculated using:

$$\rho = \frac{\tau}{\tau + (^2/3)\pi}$$

where τ = estimated variance and π = 3.142.

RESULTS

Respondents who had experienced physical violence were 806 (26.9%). Of this figure, 353 (23.6%) were males and 453(30.3%) were females (p<0.0001). Table 1 shows the percentage reporting physical violence by hypothesized predictors or factors. 198 (2.5%) males with tertiary education had experienced physical violence, compared with 203 (31.8%) females. 191 (26.2%) males and 263 (37.4%) females who experienced physical violence were less than 30 years. 180 (22.0%) single males and 282 (30.7%) females who were married had experienced physical violence. 120 (30.2%) male smokers and 9 (42.9%)

(42.9%) female smokers had experienced physical violence. 201 (27.2%) male drinkers and 97 (40.9%) female drinkers had also experienced physical violence. 12 (50.0%) male respondents who had smoking partners had experienced violence while 113 (52.6%) females who had partners that smoke had also experienced violence. 181 (28.5%) male respondents who had partner with tertiary education had experienced physical violence, while 219 (29.8%) females who had partner with tertiary education had also experienced violence. Furthermore, 91 (22.4%) male artisans had experienced violence compared with 175 (28.3%) females.

The multilevel logistic regression model

The relationship between physical violence and explanatory variables was explored in a multilevel logistic model. Variables that achieved statistical significance in the bivariate analysis were entered into the multilevel logistic model. Females in the 20 to 24 year age category were 2 times more likely to experience violence than those in the 15 to 19 year group (OR = 2.4, 95% CI: 1.16, 5.02, p = 0.018). Also, females in the 45 to 49 year age category were 3 times more likely to experience violence than those in the 15 to 19 year group (OR = 3.2, 95% CI: 1.38, 7.51, p = 0.007). Single females were more likely to experience violence than married females (OR = 1.10, 95% CI: 0.77, 1.57, p = 0.60). However, separated, divorced and widowed females were less likely to experience violence than married females (OR = 0.69, 95% CI: 0.28, 1.72, p = 0.432; OR = 0.77, 95% CI: 0.27, 2.21, p = 0.62, and OR = 0.87, 95% CI: 0.46, 1.63, p = 0.66, respectively). Females who drank alcohol were less likely to experience violence (OR = 0.77, 95% CI; 0.54, 1.10, p = 0.153) (Table 2).

In addition, females whose partners smoked were more likely to experience violence than those whose partners do not smoke (OR = 1.2, 95% CI: 0.84, 1.70, p = 0.314). However, single males were less likely to experience violence compared to the married ones (OR = 0.74, 95% CI: 0.52, 1.04, p = 0.087). Also, males who drank alcohol were more likely to experience violence than those who do not drink alcohol (OR = 1.2, 95% CI: 0.92, 1.68, p= 0.15). Males who also smoked were more likely to experience violence than those who did not (OR = 1.2, 95% CI: 0.88, 1.64, p = 0.25). Males whose partners had primary education were less likely to experience violence than those whose partners have no formal education (OR = 0.88, 95% CI: 0.43, 1.82 p = 0.74). Also, partners age was not significantly associated with violence (p>0.05). The estimate of the variances were 0.157 (SE = 0.124) and 0.276 (SE = 0.198) for males and females, respectively. The intra class correlations (ICC) were 0.068 and 0.114 for males and females, respectively (Table 3).

Table 1. Physical Violence by explanatory variables.

Variable	Male N (%)	Female N (%)
Education		
No formal education	10 (19.2)	35 (29.4)
Primary	37 (21.8)	70 (34.8)
Secondary	99 (21.6)	131(27.4)
Tertiary	198 (25.5)	203 (31.8)
Not indicated	9 (22.50	14 (25.0)
p value	0.45	0.26
Age (years)		
>30	191(26.2)	263 (37.40
31-51	119 (20.0)	133 (21.3)
51-70	34 (24.8)	39 (29.3)
>70	5 (35.7)	11 (57.9)
p for trend	0.23	<0.0001
Occupation		
Unemployed	13 (30.2)	11 (34.4)
Business	68 (20.2)	61 (38.6)
Professional	76 (27.1)	65 (36.7)
Artisans	91 (22.4)	175 (28.3)
Civil servant	28 (22.8)	33 (27.5)
Student/NYSC	59 (22.7)	65 (24.6)
Others	11 (42.3)	31 (39.7)
p value	0.098	0.007
Marital status		
Married	180 (22.0)	282 (30.7)
Separated	10 (43.5)	22 (75.9)
Divorced	9 (56.3)	19 (70.4)
Widowed	4 (33.3)	20 (28.6)
Single	146 (23.7)	106 (24.3)
p value	0.003	<0.0001
Smoking status		
Yes	120 (30.2)	9 (42.9)
No	227 (21.2)	433 (30.2)
p value	<0.0001	0.234
Drinking status		
Yes	201 (27.2)	97 (40.9)
No	148 (20.2)	345 (28.0)
p value	0.002	<0.0001
Partners smoking status		
Yes	12 (50.0)	113 (52.6)
No	312 (23.3)	305 (26.5)
p value	0.002	<0.00001
Partners drinking status		
Yes	91 (33.1)	214 (42.0)

Table 1. Contd.

No	231 (21.3)	206 (23.9)
p value	<0.0001	<0.0001
Partner's education		
No formal education	9 (13.0)	18 (26.5)
Primary	33 (20.9)	60 (34.3)
Secondary	112 (21.4)	119 (30.6)
Tertiary	181 (28.5)	219 (29.8)
p value	0.002	0.602
Age of partner (years)		
>30	205 (22.2)	99 (26.4)
31-51	106 (28.1)	219 (30.6)
51-70	17 (32.7)	69 (36.5)
>70	2 (50.0)	9 (27.3)
p for trend	0.033	0.096

Table 2. Factors associated with violence among males.

Variable	Odds ratio	P-value	95% C. I
Smoking status			
Do not smoke*			
Smoke	1.2	0.25	0.88-1.64
Drinking status			
No alcohol*			
Take alcohol	1.25	0.15	0.92-1.68
Marital status			
Married*			
Separated	1.10	0.86	0.41- 2.94
Divorced	0.24	0.07	0.05- 1.11
Widowed	0.85	0.83	0.20- 3.69
Single	0.74	0.09	0.52-1.05
Age of partner			
15-19*			
20-24	0.95	0.81	0.62-1.46
25-29	0.85	0.51	0.52-1.38
30-34	0.86	0.61	0.49-1.51
35-39	0.97	0.92	0.52-1.79
40-44	0.61	0.14	0.32-1.18
44-49	0.86	0.66	0.43-1.71
50 and above	0.66	0.25	0.33-1.34
Partner's education			
No formal education*			
Arabic	3.1	0.11	0.77-12.5
Primary	0.88	0.74	0.43-1.82
Secondary	0.80	0.53	0.40-1.60
Ordinary National Diploma (OND)	1.0	0.99	0.48-2.08

Table 2. Contd.

Higher National Diploma (HND)	1.05	0.91	0.46-2.38
National Certificate of Education (NCE)	0.88	0.75	0.39-1.94
Degree	0.79	0.53	0.38-1.66

*Reference category.

Table 3. Factors associated with violence among females.

Variable	Odds ratio	p Value	95% Confidence interval
Age(years)			
*15-19			
20-24	2.41	0.018	1.16-5.02
25-29	2.71	0.009	1.28-5.74
30-34	2.73	0.012	1.25-5.99
35-39	2.15	0.065	0.95-4.86
49-44	1.58	0.287	0.68-3.66
45-49	3.22	0.007	1.38-7.51
50 and above	1.90	0.140	0.81-4.47
Drinking status			
*No alcohol			
Take alcohol	0.77	0.153	0.54-1.10
Marital status			
*Married			
Separated	0.69	0.432	0.28-1.72
Divorced	0.77	0.623	0.27-2.21
Widowed	0.87	0.659	0.46-1.63
Single	1.10	0.599	0.77-1.56
Partner's smoking status			
*Do not smoke			
Smoke	1.20	0.314	0.84-1.70
Partner's drinking status			
*Do not drink			
Drink	0.92	0.57	0.69-1.23

*Reference category

DISCUSSION

Domestic violence occurs at an alarming rate worldwide and remains a problem of public health importance. This study addresses domestic physical violence and makes important contributions to the understanding of the determinants of domestic physical violence from the perspective of each gender. Findings of this study showed that more females experienced physical violence than males. This might be due to the obvious notions that men are stronger than women as more men also smoke and drink than the women. The female prevalence found in this study is similar to the one reported in Zambia in the Demographic and Health Survey (DHS) which looked at violence in married women (Zambia DHS, 2002). However, a lower rate was observed in South Africa among the 15 to 19 year olds (WHO, 2005). In addition surprisingly, studies in Kenya, Ethiopia and Tanzania reported much higher rates in women (Askew, 2006; WHO, 2005). However, the prevalence rates reported in this study could still be underestimated because of beliefs that issues concerning families and intimate

relationships should not be discussed as it is seen as a 'private matter'. Of special interest is the extent of violence against men in our environment which has been over looked. These sends out warning signs that consideration and urgent attention should be given to curb domestic violence both among men and women.

The prevalence of physical violence reported in this study (26.9%) was quite higher than that of the cross sectional survey by Anderson et al. (2007) in Malawi which reported 14% for men and 18% for women. Although most of the other studies focused on women, the prevalence rates found in this study are comparable to a synthesis of Canadian studies by Clark et al. (2003) that found a prevalence of between 0.4 and 23%. Findings of this study also corroborate studies done by Wijma et al. (2003) which reported a prevalence rate of 25.2% for physical violence. The findings of this study are also consistent with findings from the WHO multi-country study which reported that between 4 and 54% of respondents experienced physical and sexual violence (Gracia-Moreno et al., 2006). The rates of physical violence against men in this study are higher than that of Lupri (1998) in which 12.3% reported they had sustained abuse from their female partners in the 12 months preceding the survey. This is also supported by studies done by Kwong et al. (1999) which reported that 12.5% of the women indicated that they had inflicted abuse on their male partners.

The associated risk factors such as age, partner's smoking and drinking status indicate a strong influence of behaviour of respondents and their partners on increased risk of violence. Also, intimate partner violence must be viewed within the Nigerian cultural context and contextual factors of individuals (males and females).

Relatively young age, income, being divorced or separated, and prior victimization have been identified as characteristics that are associated with an increased risk for domestic violence from studies done by Hotaling et al. (1990). However, in this study, marital status, smoking and drinking status of respondents, partners' smoking and drinking status, age and level of education of partner were significantly associated with violence among male respondents in bivariate analysis. However for the females, age of respondent, marital status and drinking status of respondent, partners smoking and drinking status were also significantly associated with violence among females. These findings suggest that factors which influence physical violence do not really differ for both males and females.

An additional finding of interest is that relatively young age was associated with increased risk of physical violence which is also consistent with findings of Hotaling et al. (1990). Behavioural factors of partners were found to greatly influence domestic violence against females which corroborates findings by Coker et al. (1999). Females whose partners smoked also had a higher risk of experiencing physical violence.

Strategies should be put in place involving the government and all major stakeholders to curb this phenomenon. These strategies may include: Public awareness, use of the media and or encouraging victims in initiating lawsuits. Laws and policies that will adequately protect both men and women should be enacted and awareness of these laws should also be made. The findings of this study also provide additional information for those working or campaigning against gender based violence in Nigeria as it will enable them make adequate and better informed decisions.

In addition, findings based on estimates obtained from the multilevel logistic regression reflect an increased need and importance of accounting for hierarchical structure of data. Most of the significant associations in bivariate analysis disappeared in the multilevel regression analysis. Although intra-class correlations were low, nevertheless, they indicate inherent dependencies in data structure. However, the variations in outcome of interest (physical violence) may have been explained by the measured characteristics alone. Combining individual-level and aggregate data is an efficient approach in epidemiological research. Multilevel modelling has the advantage of taking the hierarchical structure of such combined data into account by specifying random effects at each level of analysis. Ultimately, the need for the application of statistical methods such as multilevel models to explain inherent dependencies in data has been established as no loss would be incurred when multilevel model is used even when it is not absolutely necessary.

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