HIERARCHICAL MODELLING OF GENDER-BASED VIOLENCE AMONG WOMEN OF REPRODUTIVE AGE IN NIGERIA

BY

BABATUNDE, SEUN MICHEAL

B.Sc. STATISTICS (FUNAAB)

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A DISSERTATION SUBMITTED TO

THE DEPARTMENT OF EPIDEMIOLOGY AND MEDICAL STATISTICS,

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UNIVERSITY OF IBADAN

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DECEMBER, 2016

CERTIFICATION

We certify that Mr Babatunde, Seun Micheal carried out this research under our guidance and supervision at the Department of Epidemiology and Medical Statistics, Faculty of public Health, College of Medicine, University of Ibadan.

.....14/07/2017.....

SUPERVISOR

Dr. (Mr.s) O.B. Yusuf

BSc (Ibadan), MSc (Ibadan), PhD (Ibadan)

Department of Epidemiology and Medical Statistics,

Faculty of Public Health.

University of Ibadan

.....14/07/17.....

CO-SUPERVISOR

Dr. R.F. Afolabi

BSc (Ilorin), MSc (Ilorin), (PhD) (Ilorin)

Department of Epidemiology and Medical Statistics,

Faculty of Public Health.

University of Ibadan

DEDICATION

To The King of Kings: Jesus Christ, My Lord and Redeemer.

To my family for their love and outright support.

ACKNOWLEDGEMENT

My deepest gratitude to God Almighty for granting me the grace, inspiration, wisdom and knowledge in completing this study. Also, my appreciation goes to my wonderful mother: Mrs. R.O Fagbemi for her immeasurable support towards this program. My warm appreciation also goes to my siblings; Oluwatobiloba and Adeola and those who are dear to me such as Omolara Oyebola, Mary Alphonso, Sunday Fagbemi and family, Pastor Gabriel Onoja and RCCG Glorious Parish, Pastor Adeoye, Mrs. S.O. Akinlade and my best friend Segun Adegbenjo and others for prayers and kindness towards me.

I want to use this medium to appreciate the kindly behavior of my supervisor Dr. (Mrs.) O.B. Yusuf during the progress of writing this project successfully. I am recalling the benevolent attitude and advice of co-supervisor Dr. R.F. Afolabi in doing what is needed. I am also grateful to all my lecturers in the Department of Epidemiology and Medical Statistics, College of Medicine, University of Ibadan for impacting knowledge in one way or the other. I am also grateful to Deaconess A.A. Ayoade and Adegoke College, Igbooora for the opportunity given in the advancement of the program. I want to recognize Mr. Philip Idowu for assistance in times of need during this dissertation.

My gratitude goes to my entire class members for their contribution in the course of the program.

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ABBREVIATIONS

ANC	Anti-Natal Care
CDC	Centers for Disease Control
CEDAW	Convention on the Elimination of All forms of Discrimination against Women
EAs	Enumeration Areas
FCT	Federal Capital Territory
FGM	Female Genital Mutilation
GBV	Gender-Based Violence
GLLAMM	Generalized Linear Latent and Mixed Models
LGAs	Local Government Areas
MLM	Multilevel Models
NDHS	Nigeria Demographic Health Survey
PAHO	Pan American Health Organization
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
USAID	United States Agency for International Development
VAW	Violence Against Women
WHO	World Health Organization

ABSTRACT

Multilevel models offer analysts of large scale, complex survey data a relatively new approach to understanding individual and contextual influences on outcome variables. In public health, large surveys often follows hierarchical structure as the surveys are based on multistage stratified cluster sampling. The exact method to analyze such survey dataset is therefore based on nested sources of variability which comes from different levels of the hierarchy. When the variance of the residual errors is correlated between individual observations as a result of these nested structures, the conventional logistic regression is inappropriate. Previous studies on Gender-Based Violence (GBV) has ignored this variability in the prevalence of GBV, and used the conventional logistic regression without taking into consideration the hierarchical structure of the population. Also, this had led to inaccurate inference. Therefore, this study investigated factors associated with GBV taking into consideration the hierarchical structure of the population.

A nationally representative sample of 14,618 women of reproductive age (15-49 years) within households in communities was obtained from the National Demographic Health Survey (NDHS) of 2013. The experience of one or more forms of GBV was the outcome variable, while explanatory variables includes age at cohabitation, residence, religion, educational status, marital status, wealth index, literacy level, alcohol intake, smoking, and region. The prevalence of violence experience and its contributing factors were summarized using frequency and proportion. Differences in the relationship between outcome and explanatory variables were measured. Multilevel logistic models was used to investigate the factors associated, and assessed the contribution of geographical variations. Adjusted odds ratios (OR), 95% confidence intervals (95%CI) as well as, Intra-class Correlation Coefficients (ICC) for each random effect were estimated.

The findings from this study shows that, women who were married constituted the highest proportion (89.7%) of the total sample with (57.3%) residing in the rural areas. The distribution of these women in terms of wealth index revealed that a higher proportion of these women belong to the richest wealth quintile (23.9%). About half of these women practice Islamic religion (49.4%). In addition, the risk of experiencing GBV is approximately two times (OR= 1.49, (1.32-1.69)) more likely among women whose husband drinks alcohol compared with their counterparts whose husband do not take alcohol. Women in the urban areas were 29% (OR=0.71, (0.54-0.92))less likely to experience GBV compared to women in the rural areas. However, women in North East, Nigeria were 68% less likely to experience GBV compared to women in North Central. Women in the South West, Nigeria were approximately five times (OR=4.68, 95%CI: 3.07-7.12) more likely to experience GBV when compared with women residing in the North Central at community-level. Gender-Based violence was approximately four times (OR=3.82, 95%CI: 2.49-5.84) more likely to occur among divorced women compared to married.

The use of multilevel models revealed the true state at which various factors influenced the experience of GBV among women in Nigeria. The model showed strong presence of GBV among women in southern, Nigeria. In addition, alcohol continues to be a strong contributor to GBV.

Key words: Multilevel models, Correlation, Multistage

Word count: 499

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CHAPTER ONE

INTRODUCTION

1.0 BACKGROUND

A contextual perspective to raising and answering research questions is intrinsically multilevel, as well as factors that affect health are viewed as simultaneously operating at the level of individuals and at the level of contexts. The term multilevel relates to the levels of analysis in researches, which usually, but not always, consists of individuals (at lower level) who are nested within spatial units (at higher levels). The term 'multilevel' has also been used to advocate a multidisciplinary perspective of public health (Anderson, 1999).

In addition, 'multilevel' refers to an analytical perspective, that is, in relation to the levels of analysis in research, which involves taking a multidisciplinary perspective on the questions of epidemiologic interest. Multilevel models also known as variance component models, random effects models and hierarchical linear models (Bryke and Raudenbush, 2002; Goldstein, 2003) provide an alternative type of analysis for univariate or multivariate analysis of repeated measures. Multilevel methods, meanwhile, consist of statistical procedures that are pertinent such as intrinsic interest in describing the variability and heterogencity in the population, over and above the focus on average relationships (Diez Roux, 2002; Subramanian, Jones et al., 2003; Subramanian, 2004); since it is clear that individuals are organized within a nearly infinite number of levels of organization, from the individual up (e.g., families, neighborhoods, countries, states, regions), from the individual down (e.g., body organs, cellular matrices, DNA), and for overlapping units (e.g., area of residence and work environment). Therefore it is necessary that links should be made between these possible levels of analysis (Susser, 1998; McKinlay and Marceau, 2000).

Causal processes are thought to operate simultaneously at more than one level which has posed an important challenge for researchers interested in understanding ecologic effects. Nevertheless, it makes intuitive sense to test for the possibility of ecological effects, besides anticipating that the impact of individual level, compositional factors may vary by context. Thus, unless contextual variables are considered, their direct effects and any indirect mediation through compositional variables remain unidentified. Moreover, composition itself has an essential ecologic dimension;

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the very fact that individual (compositional) factors may 'explain' ecologic variations serves as a reminder that the real understanding of ecologic effects is complex. Multilevel models with its simultaneous examination of the characteristics of the individuals at one level and the environment or ecologies in which they are located at another level offers a comprehensive framework for understanding the ways in which places can affect people (contextual) or, alternatively, people can affect places (composition) and also where and how effects occurs (Raudenbush at el, 2003).

The existence of multilevel data structures is neither random nor ignorable; for instance, individuals differ but so do the neighborhoods. Differences among neighborhoods could either be directly due to the differences among individuals who live in them; or groupings based on neighborhoods may arise for reasons less strongly associated with the characteristics of the individuals who live in them. Importantly, once such groupings are established, even if their establishment is random, they will tend to become differentiated. This would imply that the group (e.g. neighborhoods) and its members (e.g. individual residents) can exert influence on each other, suggesting different sources of variation (e.g., individual-induced and neighborhood-induced) in the outcome of interest and thus compelling analysts to consider independent variables at the individual and at the neighborhood levels. In recent times, observations that are being analyzed are large repeated or hierarchical or correlated or clustered along spatial, non-spatial, or/and temporal dimensions due to the complexity of the survey such as the Nigeria Demographic Health Survey (NDHS) but multilevel models (MLM) offer analysts of large scale, complex survey data a relatively new approach to understanding individual and contextual influences on public health. Complex sampling designs organize populations into clusters (e.g., states or geopolitical zones) and then collect data within the clusters. For example, a survey may first identify clusters (e.g., all communities within an area), sample the clusters (i.e., select some but not all of the communities), and then select units within the clusters (e.g., people within a community). Individuals living in the same neighborhood can be expected to be more alike than they would be if the sample were truly random. Clustered data also arise as a result of sampling strategies. For instance, while planning large-scale survey data collection, for reasons of cost and efficiency, it is usual to adopt a multistage sampling design. A national population survey, for example, might involve a three-stage design, with regions sampled first, then neighborhoods, and then individuals. A design of

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this kind generates a three-level hierarchically clustered structure of individuals at level-1, which are nested within neighborhoods at level-2, which in turn are nested in regions at level-3. Similar correlations can be expected for neighborhoods within a region. Much documentation exists on measuring this "design effect" and correcting for it (The LANCET GLOBAL HEALTH, 2015).

Indeed, clustered designs (e.g., individuals at level-1, nested in neighborhoods at level-2, nested in regions at level-3) are often a nuisance in traditional analysis. However, individuals, neighborhoods, and regions can be seen as distinct structures that exist in the population that should be measured and modeled. While the conventional approach to such correlated data structures is to treat the clustering as a nuisance, multilevel models view such hierarchical structures as a feature of the population and one that is of substantive interest.

1.2 PROBLEM STATEMENT

Gender-based violence (GBV) is a major public health and human rights problem nationwide; around the world at least one out of three women is beaten, coerced into sex or otherwise abused during her life time (WHO, 2004). For example, wife beating is regarded an acceptable part of marriage, an acceptance that is seen among victims and perpetrators alike (Fawole et al., 2005; Odjurin, 1993; Lawoko, 2006; Lawoko, 2008). According to Fawole (2014), wife beating is a common (31.3%) form of violence against women by husbands. Ezechi et al (2009) also reported that major perpetrators of violence experienced by pregnant women (78.7%) were husbands and boyfriends. Violence against women is widespread in terms of physical, psychological, sexual and has economic aspects such as negative impact on women's income generating power, damage to women's confidence resulting in fear of venturing into public spaces (this can often curtail Women's education, which in turn can limit their income-generating opportunities), reduced ability to participate in social and economic activities which are associated to traditional or customary practices, which may be confined to specific communities or geographical area (Pickup, Williams, Sweetman; Oxfam 2001).

According to the 2012 Gender Report in Nigeria, one out of every five Nigerian women and girls aged 15-24 years has been a victim of one form of violence or the other which shows adequate knowledge about Gender-Based Violence is still low and the risk that a woman will experience any form of violence in a lifetime is inevitable (Josephine, 2013).However the issue of

underestimating standard errors of regression coefficient might be unavoidable if the hierarchical nature is not taken into consideration which is a consequence of a researcher who fails to recognize the hierarchical structure of the data.

1.3 JUSTIFICATION

The need to explore the variations in the geopolitical zones arises from the disparity in the prevalence of GBV in different zones. Research into Gender-Based Violence, however, has largely ignored the role of macro-level factors in affecting a woman's risk of violence and the geographical distribution of abuse (Lori, Andreas; The LANCET GLOBAL HEALTH, 2015).

The multilevel model as a number of advantages in estimating group effect simultaneously with group level predictors i.e. effect of variables from both observed and unobserved group can be estimated. Ignoring the multilevel structure of variations does not simply risk overlooking the importance of neighborhood effects; it has implications for statistical validity.

1.4.1 MAIN OBJECTIVE

The main objective of this study is to investigate the effect of factors associated with experience of GBV among women of reproductive age in Nigeria taking into account the hierarchical structure of the population

1.4.2 SPECIFIC OBJECTIVES

1. To explore the differences in GBV experience in Nigeria
2. To investigate factors associated with GBV taking into account the hierarchical structure of the population
3. To assess the contribution of geographical variation to GBV in Nigeria

CHAPTER TWO

LITERATURE REVIEW

2.1 GENDER-BASED VIOLENCE

Gender-based violence is an act of Violence that is directed at an individual based on his or her biological sex, gender identity, or perceived adherence to socially defined norms of masculinity and femininity. It includes physical, sexual, and psychological abuse; threats; coercion; arbitrary deprivation of liberty; and economic deprivation, whether occurring in public or private life. Gender-based violence is a universal reality existing in all societies regardless of income, class and culture. It is both a public health challenge, a human-rights violation, and a barrier to civic, social, political and economic participation. Gender-based violence is widely recognized as an important public health problem, both because of the acute morbidity and mortality associated with assault and because of its longer-term impact on women's health, including chronic pain, gynecologic problems, sexually transmitted diseases, depression, post-traumatic stress disorder, and suicide (Campbell, 2002). It undermines not only the safety, dignity, overall health status, and human rights of the millions of individuals who experience it, but also the public health, economic, stability and security of nations (Dickens, 2016; USAID 2015). It would be difficult to find one woman, whom at one time or the other in her lifetime had not been afraid merely because she was a woman (Oni-Ojo et al, 2014). Those women who are particularly vulnerable to violence are those who live in extremely precarious conditions or who are discriminated against on the basis of race, language, ethnic group, culture, age, opinion, religion or membership in a minority group (Jekayinfa, 2012). Gender-based violence arises from the patriarchal system which since time immemorial has exerted control over women's lives. Gender-based violence affects both the physical and psychological integrity of women and men. There is no common knowledge and therefore universal agreement on a definition of what GBV is, based on the variation in national and cultural contexts being different from country to another, it is normal that GBV is been understood differently. However, common aspects of GBV have led to some consensual definitions.

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Gender-Based Violence encompasses a wide range of human rights violations and can be directed at adult women and men and male and female children. Gender-Based Violence takes the form of rape, domestic violence, sexual assault and harassment, trafficking of women, girls and boys and several harmful traditional practices including female genital mutilation/cutting, early marriage, bride inheritance and many others. Gender-Based Violence is pervasive in times of peace whereas in times of crisis, GBV may become more extreme. In armed conflict, one form of GBV, sexual violence, can become so widespread and systematic that it is considered a method of war and can escalate into a crime against humanity, a war crime and an aspect of genocide. Many consider Gender-based Violence as a synonym of Violence against Women; however there are differences between the GBV and VAW; GBV as an act of violence is not limited to the famine alone but masculine inclusive while VAW is an act of violation against the famine no matter their age range. For instance, the UN General Assembly (1993) defines violence against women as "any act of gender based violence that results in, or is likely to result in, physical, sexual or psychological harm to somebody just because they are female or male. Such act results in the deprivation of freedom and negative consequences. This violence may be exercised within or outside the household". Therefore, gender-based violence should be seen as physical, sexual, emotional or social harm or abuse directed against a person because of his or her gender role in a given society. Gender Based Violence is also defined as "any behavior aimed at sexual relations or any other sexual behavior which affects the dignity of a male or a female victim, whether such behavior may be from a superior at the work place, school or whether from families as well as from elsewhere" (Copelon, 1994). As it appears, this definition aims on one aspect of GBV, namely sexual violence. Shelah S. Bloom proposes a more contextualized definition of GBV. According to the author, "GBV is the general term used to capture violence that occurs as a result of the normative role expectations associated with each gender, along with the unequal power relationships between the two genders, within the context of a specific society" (GMO, 2010; Rwanda, 2008).

In the context of this study, GBV is understood as any harm perpetrated against a person whose results from unequal power relationships determined by social roles ascribed to women of reproductive age. Gender Based Violence encompasses a broad range of abuses, from physical and sexual assault to emotional and institutional abuse or the threat of such abuse. As such, manifestations of GBV might variously include domestic violence, rape, sexual harassment,

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In the context of this study, GBV is understood as any harm perpetrated against a person whose results from unequal power relationships determined by social roles ascribed to women of reproductive age. Gender Based Violence encompasses a broad range of abuses, from physical and sexual assault to emotional and institutional abuse or the threat of such abuse. As such, manifestations of GBV might variously include domestic violence, rape, sexual harassment,

exploitation, trafficking of women and girls, denial of rights, exclusion from social benefits and other forms of discrimination, and cultural practices that have harmful implications particularly for women and or suffering to women, including threats of such acts, coercion arbitrarily deprivations of liberty, whether occurring in public or private life". (Beck, 1999), such a definition is limitative: it sees GBV as specifically directed against women, which is not true. It is important to note that GBV also include violence perpetrated against men and boys. For instance, boys may become subjected to sexual abuse by family members or trafficked for the purpose of sexual exploitation. There are also instances where men have become survivors of domestic violence by partners or children (Bloom, 2008). In some settings, sexual violation against male may be even more prevalent compared to females, examples Prison and Armed Forces whereby in prisons, forced sex can occur among inmates to establish hierarchies of respect and discipline. Sexual violence by prison officials, police and soldiers is also widely reported in many countries. Such violence may take the form of prisoners being forced to have sex with others as a form of ''entertainment'', or to provide sex for the officers or officials in command. Elsewhere, men who have sex with other men may be ''punished'', by rape, for their behaviour which is perceived to transgress social norms. Studies conducted mostly in developed countries indicate that 5-10% of men report a history of childhood sexual abuse. In a few population-based studies conducted with adolescents in developing countries, the percentage of males reporting ever having been the victim of a sexual assault ranges from 3.6% in Namibia and 13.4% in the United Republic of Tanzania to 20% in Peru. Studies from both industrialized and developing countries also reveal that forced first intercourse is not rare. Unfortunately, there are few reliable statistics on the number of boys and men raped in settings such as schools, prisons and refugee camps. Most experts believe that official statistics vastly under-represent the number of male rape victims. The evidence available suggests that males may be even less likely than female victims to report an assault to the authorities. There are a variety of reasons why male rape is underreported, including shame, guilt and fear of not being believed or of being denounced for what has occurred. Myths and strong prejudices surrounding male sexuality also prevent men from coming forward (WHO, 2003). Men and male children can also suffer from GBV.

Nevertheless, as highlighted earlier, because of the unequal distribution of power between men and women, women and girls constitute the vast majority of persons affected by GBV, with major perpetrators being males (WHO/PAHO, 2012). The UN referred to "gender-based" violence to

exploitation, trafficking of women and girls, denial of rights, exclusion from social benefits and other forms of discrimination, and cultural practices that have harmful implications particularly for women and or suffering to women, including threats of such acts, coercion arbitrarily deprivations of liberty, whether occurring in public or private life". (Beck, 1999), such a definition is limitative: it sees GBV as specifically directed against women, which is not true. It is important to note that GBV also include violence perpetrated against men and boys. For instance, boys may become subjected to sexual abuse by family members or trafficked for the purpose of sexual exploitation. There are also instances where men have become survivors of domestic violence by partners or children (Bloom, 2008). In some settings, sexual violation against male may be even more prevalent compared to females, examples Prison and Armed Forces whereby in prisons, forced sex can occur among inmates to establish hierarchies of respect and discipline. Sexual violence by prison officials, police and soldiers is also widely reported in many countries. Such violence may take the form of prisoners being forced to have sex with others as a form of ''entertainment'', or to provide sex for the officers or officials in command. Elsewhere, men who have sex with other men may be ''punished'', by rape, for their behaviour which is perceived to transgress social norms. Studies conducted mostly in developed countries indicate that 5-10% of men report a history of childhood sexual abuse. In a few population-based studies conducted with adolescents in developing countries, the percentage of males reporting ever having been the victim of a sexual assault ranges from 3.6% in Namibia and 13.4% in the United Republic of Tanzania to 20% in Peru. Studies from both industrialized and developing countries also reveal that forced first intercourse is not rare. Unfortunately, there are few reliable statistics on the number of boys and men raped in settings such as schools, prisons and refugee camps. Most experts believe that official statistics vastly under-represent the number of male rape victims. The evidence available suggests that males may be even less likely than female victims to report an assault to the authorities. There are a variety of reasons why male rape is underreported, including shame, guilt and fear of not being believed or of being denounced for what has occurred. Myths and strong prejudices surrounding male sexuality also prevent men from coming forward (WHO, 2003). Men and male children can also suffer from GBV.

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acknowledge that such violence is rooted in gender inequality and is often condoned and tolerated by laws, institutions and community norms. Other authors state that GBV is not only a manifestation of gender inequality, but often serves to enforce it (Sen, 2007; Fergus, 2012; Bott, 2004).

Gender Based Violence is often divided into two interlinked categories, interpersonal and structural/institutional violence. Interpersonal violence refers to an act of economic, sexual and psychological or other violence perpetrated by individual against another individual. Structural/institutional violence refers to any form of structural inequality or institutional discrimination that maintains a person in a subordinate position, whether physical or ideological to other people within her family, household or community (Manjoo, 2011).

2.2 GLOBAL OVERVIEW OF GENDER BASED VIOLENCE

Around the world, violence against women (VAW) is a global phenomenon that exists even beyond cultural, geographical, religious, social and economic context cases such as beating, coerced into sex or otherwise abuse is suffered at least to one out of every three women during her life time. It is widely recognized that even today, a lack of reliable and continuous data is an obstacle in having a clear picture of violence against women (UN, 2013) so a historical picture of violence against women becomes even more difficult to capture. Although the history of violence against women is difficult to track, some claim that violence against women has been accepted, and even condoned and legally sanctioned throughout history. (VAW, 2013) Examples include the fact that Roman law gave men the right to chastise their wives, even to the point of death, (Virginia Law Register, 2013) the burning of witches, which was condoned by both the church and the state, (VAW, 2013) and an 18th-century English common law allowing a man to punish his wife using a stick "no wider than his thumb." This rule for punishment of wives prevailed in England and America until the late 19th century. (VAW, 2013) Some historians believe that the history of violence against women is tied to the history of women being viewed as property and a gender role assigned to be subservient to men and also other women. (Penelope Harvard and Peter Gow, 1994). GBV against women has been acknowledged worldwide as a violation of basic human rights in which majority of these perpetuators happens to be member of her own family

(WHO, 2004). The research reported that more than 60% of women worldwide have been abused (UNFPA, 2002). According to report, a total of 48 population-based surveys around the world estimates 10-69% of the women were reportedly assaulted by an intimate partner (Krugal et al, 2002). Although statistics on the prevalence vary, the scale is tremendous, the scope is vast and the consequences for individuals, families, communities and countries are devastating. Prevalence of women in developing countries who experience violation during pregnancy ranges from 4-20%, (Nasir et al, 2003). Gazamararian (1995) reported that GBV is four times more likely among women with unwanted pregnancy compared with those who intentionally got pregnant. Violence against women is widespread in terms of physical, psychological, sexual and economic aspects which are associated to traditional or customary practices, which are confined to specific communities or geographical area (UNECE, 2010). Findings from a cohort study from Uganda showed that pregnant women exposed to violation are more likely to deliver babies of low birth-weight and have a 37% higher risk of obstetric complications (such as hypertension, premature rupture of membranes, and anaemia) that necessitate antepartum hospitalisation (Kaye et al., 2006). Although violence experience affects women of all ages, women of reproductive age have increased vulnerability, and the increasing evidence supporting the adverse impact of violence on women's reproductive health, further strengthens this assertion. Research indicates a correlation between violence exposure and an increased risk of gynecological disorders, unwanted pregnancies, terminated pregnancies, child loss during infancy, premature labour, more births, and sexually transmitted diseases including HIV/AIDS (Bourke-Martignoni, 2002; WHO, 2002; Heise, 1994; Ilika, 2002; Tjaden & Theonnes, 1997). Violence against women has been linked to negative health outcomes, including physical injuries such as bruises and fractured bones (Koenig et al., 2003; Aimakhu et al., 2004; Fawole et al., 2005)

A 2007 study by researchers at Centers for Disease Control, (CDC) found out that women are slightly more likely to be victimized by reciprocal violence suffered in the past not minding the source of the wrong doing. This study also observed that almost three quarters of non-reciprocal violence is perpetuated by women which might actually be due to the state of females has been fragile. Additionally, women are more likely to be injured in non-reciprocal violence and men are likely to be injured by reciprocal violence (Tjaden and Thoennes, 2000). The great reluctant of many men and boys to report domestic violence makes it difficult to accurately assess its scope worldwide. The limited statistics that exists, almost certainly vastly under-report the number of

male victims. The war against this multi-faceted problem short changed by the lack of adequate data to accurately estimate its incidence and health impact which hampered various efforts to present the issues raised in broader perspective. An increasing amount of research highlights the health burdens, intergenerational effects and demographic consequence of such act (UN, 2006). The knowledge of these issues is necessary for the development of interventions needed to curb the menace.

Findings from most extensively conducted study on gender violence; "The World Health Organization multi-country study on women's health and domestic violence against women which involves over 24,000 women in ten countries around the world, confirms that GBV seriously affects women's health and that level of violence varied greatly both within and between countries (WHO Summary report, 2005).

In some African societies e.g. Ghana, an individual's risk of gender violence has been associated with childhood experience of family abuse. Meanwhile, In some African societies e.g. Ghana, an individual's risk of gender violence has been associated with childhood experience of family abuse. Meanwhile, family violence differs along ethnic lines (Tenkerang and Owusu, 2013). It is possible for GBV to be under-reported especially among married couples given the stigma and other related challenges attached to reporting such incidence in most African countries (Zubairu, 2011). Besides, there are certain types of violence, associated to traditional or customary practices, which are confined to specific communities or geographical area. For instance, wife inheritance in Southern Africa, female genital mutilation among others in East and West Africa etc.

2.3 OVERVIEW OF GENDER BASED VIOLENCE IN NIGERIA

In a nation like Nigeria, GBV is of a serious concern to agencies such as human rights and other sectors such as economic, health institutions including law enforcement agencies such as Convention on the Elimination of All Forms of Discrimination against Women, (CEDAW) which has showed different efforts and improved services for women who are victims in other to eradicate or bring to the barest minimum through awareness programs. Though GBV has been centered on men as the perpetuators of domestic violence however, this is not to deny the cases of

men being victims of domestic violation do exist (Yusuf et al, 2011; WHO, 2000). Abuse is a control issue, abusers believe they have the right to manipulate, control and humiliate another person and this belief is not only held by some men but also by some women too. For example, wife beating is regarded an acceptable part of marriage, an acceptance that is seen among victims and perpetrators alike (Fawole et al., 2005; Odjurin, 1993; Lawoko, 2006; Lawoko, 2008). A culture of silence surrounds cases of violence against women in most countries in Africa like Nigeria, making it difficult to get true picture of its extent within families, inside homes and communities (Jakayinfa, 2015). More than 20% of employed women take time off work because of being abused, and 2% lose their jobs as a result of abuse (Eze-Anaba, 2010). Fawole et al (2014) reported a GBV prevalence of 24% among young women with a prevalence of 30.4% for sexual violence among young female hawkers in southwest, Nigeria. In the study on the prevalence and correlates of violence against female sex workers in Abuja, Nigeria, exposed that prior to the survey, 52.5% of the participant had experienced various forms of violence of which 41.9% were sexually abused, 37.7% experienced economic violence 35.7 and 31.9% experienced physical and psychological violence respectively (Fawole et al, 2014). As reported by a survey conducted by Project Alert (2001) on violence against market women, other professions and ladies in senior schools and higher institutions in Lagos, Nigeria; almost six out of every eight women interviewed in the working place revealed been violated by partner (boyfriend or husband). In Nigeria, the family authority structure gives men the autonomy to take major domestic decisions without reference to women, thereby placing women in a subordinate position, and making them vulnerable to various acts of gender-based violence (Okemgbo et al, 2002). For example, although it is culturally unacceptable to inflict acts of violence upon a pregnant or lactating mother, wife beating is an acceptable practice in most parts of Nigeria (Ilika, Okonkwo & Adogu, 2002). This phenomenon even has legal backing in northern, Nigeria. According to the 2012 Gender Report in Nigeria, one out of every five Nigerian women and girls aged 15-24 years has been a victim of one form of violence or the other. Report from Amnesty International, (2012) stated that a nation such as Nigeria is among several others who records high incidence of female abuse in sub-Sahara Africa with two-third of their women found to be victims. In Nigeria, domestic violence cuts across all social and cultural backgrounds. According to Fawole (2014), wife beating is a common (31.3%) form of violence against women by husbands. Ezechi et al (2009) also reported that major perpetrators of violence experienced by pregnant women (78.7%)

were husbands and boyfriends. Finding from a study conducted in Abuja by Agbo and Choji, (2014) exposed the experience of a woman whose husband constantly abused her whenever he was drunk, which lead to two miscarriages. Findings from a study conducted among pregnant Nigerians attending antenatal clinic in Lagos also discovered that 47.1% of the women had history of abuse, of which 49.2% are experiencing it during the current pregnancy (Ezechi et al, 2009). In Abeokuta, Nigeria 66.2% of pregnant women experienced a form of violation and perpetrators were often husbands (65.8%). As a result of this act almost 25% of the pregnancies were unplanned (Fawole et al., 2008).

As reported by various studies, there seems to be a cause for this variability in the prevalence of violence among individuals, between neighbours in a community or villages in a district (Lori L Heise, Andreas Katsadam, 2015; Okenwa, 2011). However, researches into gender-based violence has largely ignored the contribution of this variations to the clustered and the hierarchical structure of the data. Large-scale survey data collection, due to cost and efficiency, usually adopts a multistage sampling design and because of the clustered structure, a suitable method which could take care of such design is necessary, hence the need for hierarchical models. A national population survey, for example, might involve a three-stage design, with regions sampled first, then neighborhoods, and then individuals. A design of this kind generates a three-level hierarchically clustered structure of individuals at level-1, which are nested within neighborhoods at level-2, which in turn are nested in regions at level-3. Similar correlations can be expected for neighborhoods within a region. Much documentation exists on measuring this "design effect" and correcting for it according to Lori and Andreas, (2015). Hierarchical modelling are most useful on data that have hierarchical or clustered structure. This cluster sampling scheme often introduces multilevel dependency or correlation among the observations and as such that can have implications for model parameter estimates. When the variance of the residual errors is correlated between individual observations as a result of these nested structures, traditional logistic regression is not appropriate (Khan and Shaw, 2011).

Several studies have examined factors or predictors associated with violence in different parts of the world. The documented factors of GBV operate on different levels, ranging from individual socio-demographic characteristics to culturally related factors, predominantly in the African environment. Frequently reported socio-demographic factors that are positively associated with

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GBV include the woman's age (Koenig et al., 2003; Survey, Z.D. A. H. 2014; Gbolahan et al., 2016; Juliana et al., 2016) childhood experience of domestic violence as reported by Yount and Carrera, (2006) having a low level of education, being unemployed, financial dependence on the partner according to Dutton and Golant, (1995), using drugs or drinking alcohol [(Koenig et al., 2003; Fawole et al., 2008: Yusuf et al., 2011; Gbolahan et al., 2016;), and having more surviving children (Hinden, 2003).

2.4.0 FORMS OF GENDER BASED VIOLENCE

There are many forms of GBV such as sexual harassment, coercion, stigmatization, insult, public disgrace, obsessions, etc. which have been grouped into these categories of violation namely; physical, emotional and psychological, sexual, harmful traditional practices, socio-economic violence (Pickup, Williams, Sweetman, 2001).

2.4.1 PHYSICAL VIOLENCE

Physical violence comprises a range of physically violent acts including hits, slaps, slavery/trafficking ; forced labor, removal of organs, servitudes, kicks, beatings, burns and physical assault; use of a weapon. A total of 28% of all women have experienced physical violence since age 15; this proportion is virtually the same as that found in the both Demographic Health Survey for years 2008 and 2013 but there was decline in the experienced of physical violence within a year from an estimate of 15% in 2008 to 11% in 2013. Behaviors such as pushing, beating, slap, threatening with weapons or any form of way in inflicting injury on the body or any part of the victim is a form of physical violence. In Japan and Peru the proportion of ever-married women to have encountered physical assault by a male intimate partner ranges from 13-61% (Garcia-Moreno, 2005). Experiencing of this form of violation may vary both within and between religious groups, wealth quintile, employment status, residence, ethnicity, alcohol use, geopolitical dispensation, marital status etc.

2.4.2 SEXUAL VIOLENCE

Sexual violence is defined as: any sexual act, attempt to obtain a sexual act, unwanted sexual comments or advances, or acts to traffic, or otherwise directed, against a person's sexuality using coercion, by any person regardless of their relationship to the victim, in any setting, including but not limited to home and work. Coercion can cover a whole spectrum of degrees of force. Apart from physical force, it may involve psychological intimidation, blackmail or other threats – for instance, the threat of physical harm, of being dismissed from a job or of not obtaining a job that is sought. It may also occur when the person aggressed is unable to give consent – for instance, while drunk, drugged, asleep or mentally incapable of understanding the situation. Sexual violence includes rape, defined as physically forced or otherwise coerced penetration – even if slight – of the vulva or anus, using a penis, other body parts or an object. The attempt to do so is known as attempted rape. Rape of a person by two or more perpetrators is known as gang rape. Sexual violence can include other forms of assault involving a sexual organ, including coerced contact between the mouth and penis, vulva or anus (WHO, 2000).

2.4.3 EMOTIONAL AND PSYCHOLOGICAL VIOLENCE

Psychological and emotional violence takes account of constant disparagement or scorn, the enforcement of strict isolation; confining a person from friends, family, restricted movement, deprivation of liberty to free movement and embarrassing behavior. This form of violation usually occurs as a result of pre-occurrence or establishment of the other forms of violations which can result into serious of health issues such as depression, hypertension, suicide etc. which can lead to death or life threatening problems. This can also influence the behavior of a child either male or female that is already used to this act as a result of trauma. Examples of such abuse or harassment; which is non-sexual verbal abuse that is insulting, degrading, demeaning, and compelling the victim to engage in humiliating act whether in public or private, denying basic expenses for family survivor etc.

2.4.4 HARMFUL TRADITIONAL PRACTICE

Acts or cultural norms such as Female Genital Mutilation (FGM) is among harmful tradition practiced around the world. The existing approaches to eliminate FGM are principally founded on health-based arguments and methods. Supporters of that approach established their arguments on the need to protect women's health from hazards caused by FGM. It is acknowledged that FGM affects women's health, reproduction, and sexual functioning. According to the World Health Organization's findings (WHO) "women who have had experienced FGM are significantly more likely to experience difficulties during childbirth and that their babies are more likely to die as a result of the practice". (Shell-Duncan, Bettina; 2008) Moreover, it can "result in myriad complications, from infections, menstrual difficulties and painful intercourse to...stillbirths and brain-damaged infants, increased risk of HIV infection, and psychological and emotional stress. " (Rule, Sheila; 1985) Therefore, in order to eradicate the procedure, advocates of the health risks approach designed strategies to raise public awareness of negative impacts of FGM to women's bodies and health issues which is the cutting of genital organs for non-medical reasons, usually done at a young age; ranges from partial or total cutting, removal of genital stiches whether for cultural or non-therapeutic reasons; often undergone several times during life-time i.e. after delivery or if a girl/woman has been victim of several assaults.

2.4.5 SOCIO-ECONOMIC VIOLENCE

This form of violence which addresses the following issues such as discrimination and/or denial of opportunities which includes ; services exclusion, denial of access to education, health assistance or remunerated employment, denial of property rights etc. Socio-exclusion/ostracism based on sexual orientation such as; denial of access to services or social benefits prevention of exercise and employment of civil, social, economic, cultural and political rights, imposition of criminal penalties, discriminatory practices or physical and psychological harm and tolerance of discriminatory practices, public etc. which could lead to issues such as increased vulnerability to other types of gender-based violence, rejection, ostracism and social stigma at community, Job loss due to absenteeism as a result of violence etc. (Pickup, Williams, Sweetman, 2003; UNHCR, 2003).

2.5.0 THE MULTILEVEL MODEL

Multilevel modelling is used in the analysis of data that have hierarchical or clustered structure. Such data arise routinely in various fields such as educational research in which pupils are nested in schools; in family studies where children are nested within families; in medical research in which patients are nested in hospitals, and in biomedical research in which teeth are nested within different people's mouth in dental analysis (Joop and Cora, 2005).

This specific research design may also give rise to clustered data. Considering cost, time and efficiency consideration, stratified multistage samples are the standard for sociological and demographic surveys. For such samples, the clustering of the data is a nuisance which should be taken into consideration. This cluster sampling scheme often introduces multilevel dependency or correlation among the observations that can have implications for model parameter estimates. For multistage clustered samples, the dependence among observations often comes from several hierarchical stages. The appropriate approach to analyzing large-scale survey data which follows a hierarchical structures is based on nested sources of variability which come from different levels of the hierarchy. When the variance of the residual errors is correlated between individual observations as a result of these nested structures, traditional logistic regression is not appropriate (Khan and Shaw, 2011).

Multilevel models generally assumes that the grouping criterion is clear and that variables can be assigned unambiguously to their appropriate level or stages (Joop and Cora, 2005). Multilevel models are set to design variables from different levels simultaneously, using a statistical model which includes various dependencies. There are many types of multilevel models, which differ in terms of the number of levels (e.g., 2, 3), type of design (e.g., cross-sectional, longitudinal with repeated measures, cross-classified), scale of the outcome variable (e.g., continuous, categorical), and number of outcomes (e.g., univariate, multivariate). These models have been used to address a variety of research questions involving model parameters that include fixed effects (e.g., average student socioeconomic status mathematics achievement slope across schools), random level-1 coefficients (e.g., student socioeconomic status-mathematics achievement slope at a particular school), and variance-covariance components (e.g., amount of variation in the student socioeconomic status-mathematics achievement slope across schools).

2.5.1 MULTILEVEL REGRESSION MODEL

Research literatures explains majorly that multilevel regression model has become known under a variety of names as; hierarchical linear model, random coefficient model, variance component model and mixed (linear) model.

Often, it assumes hierarchical data, with one response variable measured at the lowest level and independent variables at all other existing levels.

The model is often viewed conceptually as a hierarchical system of regression equations. Hierarchical linear models allow for the simultaneous investigation of the relationship within a given hierarchical level, as well as the relationship across levels. Two models are developed in order to achieve this: one that reflects the relationship within lower level units, and another that models how the relationship within lower level units vary between units (thus correcting for the violation of aggregating or disaggregating data (Hofmann, 1997). This is applicable when lower lever units are nested within higher-level units.

2.5.2 APPLICATION OF HIERARCHICAL MODELLING

In the study of gender-based, alcohol use, sexual risk among female patrons of drinking venue in Cape Town, South Africa (Pitpitan et al., 2013), Multivariate hierarchical logistic regression was used to examine a conceptual model of the association between gender-based violence and alcohol use which was categorized by cognitive and behavioral aspects of use and severity. In addition, this model was further used to examine whether demographic characteristics would be associated with violence. However, hierarchical modelling helped to identify factors that were uniquely associated with recent experience of gender-based violence. It was used to detect the true significant effects of the predictors on the outcome after controlling for some factors in the stages. Eventually, it was able to reveal the extent of use and severity of alcohol with gender-based violence with alcohol.

Hierarchical models was used to check for the expected proportion of the number of Anti-Natal Care visits. This model was helpful in checking for the significant variations in the number of antenatal visits women make to health facilities and the effect of geographical variations on both the individual and state level predictor factors respectively. The result showed evidently that the number of ANC visits is significantly associated with predictor factors such as wealth index,

location of residence, educational attainment, religion etc. in the Statistical analysis of Anti-Natal Care use in Nigeria: multilevel logistic regression approach (Akinrefon et al., 2015).

Hierarchical models was applied in the impact of small cluster size on multilevel models: a Monte Carlo examination of two-level models with binary and continuous predictors (Bell et al., 2010). It evaluated the impact of sparse structures for analyzing non-normal outcome (e.g. dichotomous or count variable) not minding the model complexity. It was adequately significant on the proportion of singletons which appreciated or reduced in accuracy of their confidence interval for level predictors.

In the research survey of a cross national and multilevel correlates of partner violence: an analysis of data from population based study (Lori, Andreas, 2015), was analyzed using hierarchical modelling. The multicenter survey comprises 44 countries, representing 481205 women. It was used to examine associations between macro-level measures of socioeconomic development, women status, gender inequality and gender-related norms and prevalence of current partner violence at levels. Moreover, they tested for interactions to explore the risk at individual level which was significant when adjusted for some factors. Therefore, Gender-related factors at the national and subnational level helped to predict the population prevalence of physical and sexual partner violence within the previous 12 months as revealed from the analysis, especially predictive of the geographical distribution of partner violence are norms related to male authority over female behavior using hierarchical models.

CHAPTER THREE

METHODOLOGY

3.1 Study Area

Nigeria is located in the western Sub-Sahara Africa on the Gulf of Guinea on the Atlantic coast in the south with a land mass area of approximately 923,768 kilometer squared (km^2), making it the14th largest country and most populous country in Africa with an estimated population of 140,431,790 people according to the nation's 2006 population census (FRN Official; Gazette, 2009). The country is shares borders with the Republic of Benin in the west, Chad and Cameroon in the East and Niger in the North. Presently, Nigeria is made up of 36 states and a Federal Capital Territory, grouped into six geopolitical zones: North Central, North East, North West, South East, South South, and South West. There are 774 constitutionally recognized local government areas (LGAs) in the country. Nigeria has more than 250 ethnic groups with varying languages and customs, creating a country of rich ethnic diversity. The largest ethnic groups are the Fulani/Hausa, Yoruba, Igbo accounting for 68% of population whereby the Edo, Ibibo, Kanuri, Ijaw, Tiv, Nupe and Ebira comprises of 27% with other minorities to make up the remaining 5%.

3.2 Study Design

Dataset used for this study was obtained from the individual recode dataset of the Nigeria Demographic Health Survey (NDHS 2013) and a secondary data analysis was done to achieve the study objectives. This study was a cross-sectional population based study design.

3.3 Study Population

The population for the 2013 National Demographic Health Survey comprises of females aged 15-49 years and males aged 15-59 years in Nigeria. Samples were derived from the target population through random selection of households in the country, the selected individuals were interviewed. In regards to this study, women within the reproductive age 15-49 years in Nigeria are the target

population. The study population was gotten as a subsamples from the samples of women interviewed in the survey of the year 2013.

3.4. Sampling Frame and Technique

Administratively, Nigeria is divided into states. In turn, each state is subdivided into local government areas (LGAs) and each LGA into smaller (secondary and tertiary) localities. Nigeria has 36 states and a Federal Capital Territory (FCT). These states are subdivided into 774 LGAs. Furthermore, the states are regrouped by geographical location to form six zones. In addition to these administrative units and geographical zones, during the last population census in 2006, each locality was subdivided into convenient areas called census enumeration areas (EAs). The average number of households per EA in the corresponding locality frame was assigned to each EA. The EAs in Nigeria are small in size, with an average of 211 inhabitants (equivalent to 48 households). Since these EAs were too small to be DHS clusters, the 2013 NDHS included several EAs per DHS cluster (with a preferred minimum cluster size of 80 households).

The sample for the 2013 NDHS was a stratified sample, selected independently in three stages from the sampling frame. Stratification was achieved by separating each state into urban and rural areas. In the first stage, 893 localities were selected with probability proportional to size and with independent selection in each sampling stratum. In the second stage, one EA was randomly selected from most of the selected localities with an equal probability selection. In a few larger localities, more than one EA was selected. In total, 904 EAs were selected. After the selection of the EAs and before the main survey, a household listing operation was carried out in all of the selected EAs. The household listing consisted of visiting each of the 904 selected EAs, drawing a location map and a detailed sketch map, and recording on the household listing forms all occupied residential households found in the EA with the address and the name of the head of the household. If a selected EA included less than 80 households, a neighboring EA from the selected locality was added to the cluster and listed completely. The resulting list of households served as the sampling frame for the selection of households in the third stage. In the third stage of selection, a fixed number of 45 households were selected in every urban and rural cluster through equal probability systematic sampling based on the newly updated household listing.

3.5 Data Source and Sample Size

A representative sample of 40, 320 households were selected for the 2013 NDHS survey. Of the occupied households, 38,522 were successfully interviewed, whereby a total of 39,902 women aged 15-49 and 18,229 males aged 15-59 were eligible for interview. However, 38,948 females and 17,359 males were successfully interviewed. For this study, a sample size of 27,634 women within the reproductive age of 15-49 years who have been violated or experienced violence prior to the survey and providing information about their experience as victims of violation.

3.6 Data Collection

The Woman's Questionnaire was used to collect information from all women age 15-49. These women were asked questions on the main topics such as background characteristics (age at cohabitation, religion, education, literacy etc.), marriage and sexual activity, woman's decision making, domestic violence etc. The 2013 NDHS gathered information on attitudes toward wife beating. Women and men were asked whether a husband is justified in beating his wife in various circumstances: if the wife burns the food, argues with him, goes out without telling him, neglects the children, or refuses sexual intercourse with him. However, information was obtained from ever-married women on violence committed by spouses and others and from never-married women on violence committed by anyone, including boyfriends. The use of valid measures of violence was adopted with the instrument (questionnaire) for questions such as if the respondent has ever been humiliated, threatened by harm, insulted, pushed, slapped, physically forced into sex, undergone circumcision etc. which are grouped into the forms of violence like physical, sexual, emotional and psychological, harmful traditional practice and socio-economic violence.

The DHS survey fieldwork was launched in the six zones (rather than all of the states); the teams in each zone remained together, and the first clusters were assigned in the vicinity. This enabled close supervision of the teams, as three to four trainers were available in each zone. Interviewers had ample opportunities to build their confidence before they were finally dispatched to their respective states. Fieldwork for the 2013 NDHS was carried out by 37 interviewing teams, one for each of the 36 states of the country and Federal Capital Territory. Each team consisted of a supervisor, a field editor, four female interviewers, two male interviewers, and two drivers. Fieldwork was conducted from February 15, 2013, to the end of May (with the exception of the two teams in Kano and Lagos, who completed fieldwork in June).

The technical team and trainers, who also functioned as the quality controllers, were responsible for ensuring data quality. Data quality was also monitored through field check tables generated concurrently with data processing operations.

3.7 Data Structure

The data was structured in a three stage hierarchical form (NDHS Report, 2013). The first stage is the sampling probability of the individuals (unit i) for each of the 904 selected households (cluster j) within the i^{th} locality as the second stage which were further clustered in 45 communities (super-cluster k) the third stage of the study. The structure of the hierarchical model is shown in figure 1 below:

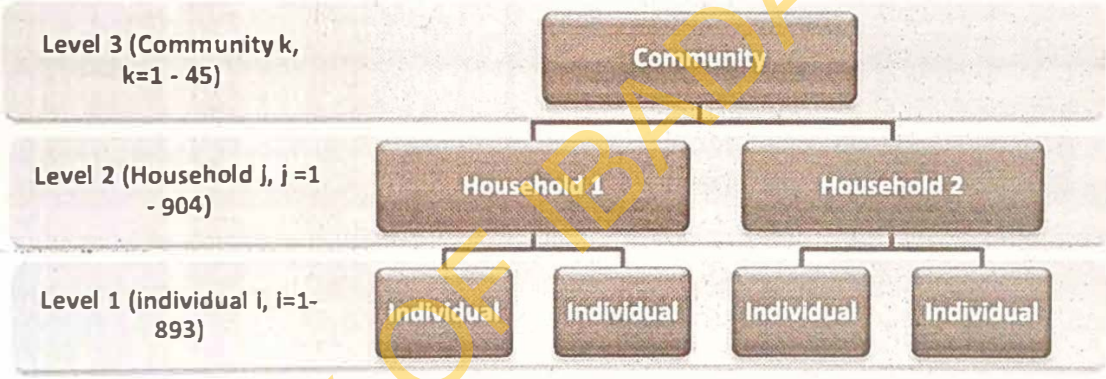

Figure 1: Hierarchical Structure of the data

3.8.0 STUDY VARIABLES

3.8.1 Outcome Variable

The outcome variable considered in this analysis was the experience of any form of violence, which were physical, sexual, emotional and psychological, harmful traditional practice and socio-economic violence. This forms of violence were collapse to a single variable; Gender-based violence. Gender-based violence was determined based on the response to questions asked on whether the respondent had any past experience of any of the form of gender-based violence experienced labelled as (Yes or No).

3.8.2 Explanatory Variables

The choice of variables for the identification of risk factors which was inclusive in the NDHS data collected was based on previous published studies and literature review on gender based violence (Heise, 1998; Hindin and Adair, 2002; Jewks et al, 2002; Karamaji et al., 2006; Tia Palermo, 2013; Fawole 2005;; Uthman, Lamoke and Moradi, 2009; Okenwa, 2011, Yusuf et al., 2011; Gbolahan, 2016). The explanatory variables used in the analysis were measured at three levels which includes individual level comprising of age at first sex, age at cohabitation, marital status, highest educational level, partner/husband smoking status, partner/husband alcohol use and literacy. Household level variables were religion and wealth index, while community level variables were residence (urban/rural), and region. The figure 2 below shows the three levels.

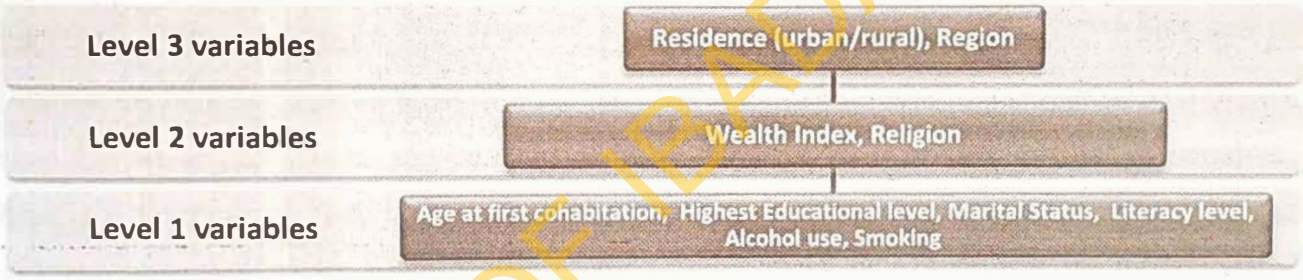

Figure 2: Distribution of the explanatory variables across the levels

3.8.2.1 Level 1 (Individual) Variables

Age at first cohabitation (age at which they got married or started living with partner which pertains to individuals) ranges from 15-49years, Current marital status which is categorized as (never in union, married, living with partner, widowed, divorced and separated), Highest educational level in categories (no education, primary, secondary and tertiary), literacy level (cannot read at all, able to read only part, able to read all, no card with required language, visually impaired), Alcohol use (Yes, No) and Smoking (Yes, No).

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3.8.2.2 Level 2 (Household) Variables

Wealth Index pertaining to each family which individual belong to and Religion; the entire household happened to be affected based on religious teachings and believes in their way of conduct as a family.

3.8.2.3 Level 3 (Community) Variables

One of the variable identified in this cluster is region which is categorized as (South West, South South, South East, North Central, North East and North West), Residence (two categories i.e. rural and urban).

3.9 Data Management and Analysis

3.9.1 Data Management

Descriptive statistics such as mean and standard deviations were used to summarize quantitative variables while proportions and percentages were used for summarizing qualitative variables. Bivariate analysis was used to investigate the factors (covariates) which are associated with the outcome variable (Gender Based Violence) and differences in the experiences among women of reproductive age. P-value less than 5% were considered to be statistically significant.

The variables which showed significant association in the bivariate analysis were further analysed using a multilevel model to further investigate the association and to identify among the factors influencing GBV among women of reproductive age in Nigeria due to its hierarchical structure. Multilevel model was used to investigate these factors and their effect including influence on GBV. This was also used to check for contributions due to geographical variations to GBV among women of reproductive age by assessing the factor, region.

The generalized linear latent and mixed models (GLLAMM) as adopted by (Rabe-Hesketh, Skrondal, and Pickles, 2004) was installed on the stata version 12 to handle wide array of response types including continuous, ordered and unordered categorical responses which due to this generality, there were estimations implemented using numerical integrations. The installation was because gllamm is more general and has more options for predictions and diagnostics.

3.9.2 Model Assumptions and Specifications

3.9.2.1 Model Assumptions

The structure behind assumptions which happened to be attributed with multilevel models is that they are virtually identical to those for ordinary regression—only that there are more error terms to be evaluated. Failure to meet the assumptions of a proposed statistical model may cause the results to be misleading and conclusions from such analysis invalid. Thus, assessing these assumptions is essential for the confidence level on the validity of such conclusions.

For the multilevel logistic model for binary response, the major assumptions are:

1) Distributional assumption: y_{ijk} takes on values 0 or 1 (i.e. the probability of success $(y_{ijk} = 1)$ is identical for all individual within clusters). y_{ijk} ~Bernoulli(p_{ijk}) with a logit link i.e. logit $\{\Pr(y_{ijk} = 1|X_{ijk})\} = \text{logit}(p_{ijk})$, (see Equations 1 and 2 below) where p_{ijk} is the systematic component of the model.

2) Observations between clusters are independent, whereas pairs of observations within clusters have a common correlation, i.e. observations within the same individual, likewise, individuals within the same household and household within the same community are correlated. But observations between different individuals (household) and different household (community) are not correlated.

3) The random effects u_{jk} and d_k are normally distributed, with mean zero (i.e. each random effect can be estimated using maximum likelihood) and are independent for different groups.

4) Random effects and model predictors at all levels are independent

In this study, the first assumption held because Experience of any form of violence – the outcome variable, was categorized i.e. dichotomous.

It was also assumed that the each individual, household and community had its own underlying level at which Gender based violence is been experienced which varied from each individual to individual, each household to household and from each community area to community area. This implied a certain correlation structure to the levels and repeated measures in the sense that the

random effects u_{jk} and d_k respectively accounted for the interdependencies of the observations within individuals, households and communities, which further validate the second, third and fourth assumptions respectively.

3.9.2.2 Model Specifications

In the following model specifications, y_{ijk} represents the dependent variable and $X_{ijk} \equiv (x_{1ijk}, x_{2ijk}, \ldots, x_{10ijk})^T$ is a vector containing Q fixed effect predictors such as Age at first cohabitatio, Smoking, Current marital status, Highest Educational level and Wealth index. $u_{jk} \sim N(0,\sigma_u^2)$ is a random intercept varying over households (level 2), and at (level 3), $v_k \sim N(0,\sigma_v^2)$ is a random intercept varying over communities, (clusters) which were assumed to be independent of each other. In other words it is assumed that there was a random heterogeneity in respondents' underlying risk of GBV that persists throughout the entire duration of the study. The models are all specified as random-intercept. The unconditional and the fixed effects models were given by:

An unconditional (empty) random intercept three-level logistic model (Model 0)

In this model, no predictor is included. It serves as a baseline for comparing other models. It first assesses the mean of the outcome variable and then the amount of outcome variation that exists in individual, household and community levels. This latter information is important as it helps determine which level (i.e., Level 1, Level 2 or 3) of predictors to add when fitting the subsequent models. If the variation is high, it suggests that certain amount of outcome variation could be explained by the predictors at that level. This model considers that the overall level of violation is allowed to vary over individuals, households and communities with no controlling factors and covariates.

$y_{ijk} \sim \text{Bernoulli}\,(p_{ijk})$, with

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An unconditional (empty) random intercept three-level logistic model (Model 0)

In this model, no predictor is included. It serves as a baseline for comparing other models. It first assesses the mean of the outcome variable and then the amount of outcome variation that exists in individual, household and community levels. This latter information is important as it helps determine which level (i.e., Level 1, Level 2 or 3) of predictors to add when fitting the subsequent models. If the variation is high, it suggests that certain amount of outcome variation could be explained by the predictors at that level. This model considers that the overall level of violation is allowed to vary over individuals, households and communities with no controlling factors and covariates.

$y_{ijk} \sim \text{Bernoulli}\,(p_{ijk})$, with

$$\text{logit}\ \{\Pr(y_{ijk} = 1|X_{ijk})\} = \text{logit}\ (p_{ijk}) = \beta_0 + u_{jk} + v_k \quad (1)$$

Here $X_{ijk} \equiv \{\phi\}^{\mathrm{T}}$ is an empty matrix.

A three-level logistic fixed effects random intercept model (Models 1, 2 and 3)

These models consider that the overall level of violation is allowed to vary over individuals and households after controlling for other factors and covariates. Fixed effects variables are included in this model:

$y_{ijk} \sim$ Bernoulli (p_{ijk}), with

$$\text{logit}\ \{\Pr(y_{ijk} = 1|X_{ijk}, u_{jk})\} = \text{logit}\ (p_{ijk})$$

$$= \eta_{ijk} + \beta_1 x_{1ijk} + \beta_2 x_{2ijk} + \cdots + \beta_6 x_{6ijk} \quad (2)$$

Where the intercept η_{ijk} varies between households j and community (cluster), k. Denoting the six covariates the individual level as $x_{1ijk}, \ldots, x_{6ijk}$.

The two covariates at the household level as w_{2jk} and w_{3jk}, the household level (level-2) model for the intercept becomes

$$\eta_{ijk} = \Pi_{11k} + \Pi_{7k} w_{2jk} + \Pi_{8k} w_{3jk} + u_{jk} \quad (3)$$

Here only the intercept Π_{11k} has the k subscript and therefore requires a community-level, (cluster) (level-3) model.

$$\Pi_{11k} = \gamma_{11k} + \gamma_{9k} z_{2jk} + \gamma_{10k} z_{3jk} + v_k \quad (4)$$

Where z_{2k} is the residence and z_{3k} is region, the covariates at level 3. Substituting the model for Π_{11k} into level-2 and subsequently for η_{ijk} into the level-1 model, we obtain equation(5) below:

N.B.: Note that there is no term for the level 1 error variance, since in binary variables the variance is completely determined by the mean. It is also worthy to mention that the above models can be viewed as latent-response models which assumed that underlying the observed dichotomous response y_{ijk} (whether the participant has any experience of any form of violation or not), there is a latent continuous response y^*_{ijk}, representing the experience of been violated or not experience any violation. If this latent response is greater than 0, the observed response is 1:

$$y_{ijk} = \begin{cases} 1 & \text{if } y^*_{ijk} > 0 \\ 0 & \text{otherwise} \end{cases}$$

The model (2) above can then be specified for the latent response y^*_{ijk} as

$$y^*_{ijk} = \beta_0 + \beta_1 x_{1ijk} + \beta_2 x_{2ijk} + \cdots + \beta_{10} x_{10jk} + u_{jk} + v_k + \epsilon_{ijk} \quad (5)$$

Where ϵ_{ijk} is a residual error term that has a logistic distribution with variance $\pi^2/3$.

3.9.3 Different Types of Intra-class Correlation Coefficients for the Latent-Responses

In a two-level logistic model, one can only consider a single intra-class correlation coefficient (ICC) say,

$$\rho \equiv \text{Cor}\left(y^*_{ij}, y^*_{i'j} \middle| X_{ij}, X_{i'j}\right) = \text{Cor}\,(u_{ij}, u_{i'j}) = \frac{\sigma_u^2}{\sigma_u^2 + \pi^2/3}$$

Unlike the two-level logistic model, one can consider more than 1 type of ICC for pairs of responses in a three-level logistic model:

For the same community k, but two different households say j and j', one obtain

$$\rho(\text{community}) \equiv \text{Cor}\left(y^*_{ijk}, y^*_{i'j'k} \middle| X_{ij}, X_{i'j'k}\right) = \frac{\sigma_d^2}{\sigma_u^2 + \sigma_d^2 + \pi^2/3}$$

In contrast for the same household j (implying the same community k), one obtain

$$\rho(\text{household, community}) \equiv \text{Cor}\left(y^*_{ijk}, y^*_{i'j'k} \middle| X_{ij}, X_{i'j'k}\right) = \frac{\sigma_u^2 + \sigma_d^2}{\sigma_u^2 + \sigma_d^2 + \pi^2/3}$$

The ICC (ρ) quantifies the variation within the same participant (enumeration area) (Larsen & Merlo, 2005). In other words, it directly measures the 'closeness' of observations on (in) the same household (community) relative to closeness of observations on (in) different household (community). Analogously, ρ can also be thought of as R^2 (the coefficient of determination) in linear regression.

3.9.4 Modelling Procedure for the Analysis of Objective 2 and 3

Model 0: The unconditional random-intercept model (Equation 1 above) was fitted firstly to serve as baseline for comparing other models.

Model 1: In this model, all fixed effects variables at level 1 i.e. age at first cohabitation, age at first sex, highest educational level, marital status, alcohol use, smoking and literacy level were included in model 0 in order to develop a fixed effects random-intercept model for level 1 variables.

Model 2: Here, model 1 was adjusted for the fixed and random effect variables respectively at level 2 i.e. wealth index and religion. This helped to investigate the extent to which financial stability influenced the prediction of GBV among women of reproductive age in Nigeria.

Model 3: Finally, model 2 was adjusted for the fixed and random effect variables respectively at level 3 i.e. residence and region. This helped to investigate the extent to which the areas of residence influenced the prediction of GBV among women of reproductive age in Nigeria.

Each model, models 0, 1, 2 and 3, determined its respective Individual (level 1), Household (level 2) variance σ_u^2 and Community (Level 3) variance σ_d^2. From these variances, the variability ρ(household, community) and ρ(community) respectively to within individual and within area factors influencing GBV were estimated.

The results of the fixed part of the models were presented as odds ratios together with their 95% confidence intervals (95% CI); while for the random part of the models, the ICC for each random effect was presented.

The models were compared, to determine which one of them fit best the data, using the deviance statistic -2 × Log Likelihood (-2LL) test; on the assumption that the model with the least -2LL fit best the data.

CHAPTER FOUR

RESULTS

4.1 Characteristics of Respondents

The mean age at which women first cohabitate was 18.6 years (SD=5.0). Table 4.1 shows that the women who were married constitute the highest proportion (89.7%) out of a total sample 14,618 respondents recruited; of this (57.3%) resides in rural areas. The distribution of the respondents in terms of wealth index revealed that a higher proportion of these women belong to the richest wealth quintile (23.9%).About half of these women practiced Islamic religion (49.4%). In addition, approximately 36.9% of these respondents were reportedly uneducated while lower proportion possessed higher education (10.6%).

It is also worthy to note that, about 77.0% of the respondent's partners/husbands were not under the influence of alcohol. Similarly, 99.5% of the respondent's partners were not smokers.

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Table 4.1: Respondent's characteristics

Characteristics	Number (%)
Age at first cohabitation	
15-19	9373 (64.1)
20-24	3325 (22.7)
25-29	1463 (10.0)
30-34	374 (2.6)
35-39	63 (0.4)
40-46	20 (0.1)
Highest Level of education	
No education	5400 (36.9)
Primary	3074 (21.0)
Secondary	4594 (31.4)
Higher	1550 (10.6)
Literacy	
Cannot read at all	6898 (47.4)
Able to read parts of sentence	1173 (8.1)
Able to read whole sentence	6448 (44.3)
No card with required lang.	19 (0.1)
Blind/Visually impaired	8 (0.1)
Current marital status	
Married	13113 (89.7)
Living with partner	568 (3.9)
Widowed	538 (3.7)
Divorced	176 (1.2)
Separated/No longer with partner	223 (1.5)
Smoking	
No	14547 (99.5)
Yes	71 (0.5)
Husband/Partner drink Alcohol	
No	11255 (77.0)
Yes	3363 (23.0)
Religion	
Catholic	1354 (9.3)
Other Christian	5863 (40.1)
Islam	7214 (49.4)
Traditional	118 (0.8)
Other	70 (0.5)
Wealth Index	
Poorest	2522 (17.3)
Poorer	2647 (18.1)
Middle	2708 (18.5)
Richer	3250 (22.2)
Richest	3491 (23.9)
Type of Place of Residence	
Urban	6248 (42.7)
Rural	8370 (57.3)
Region	
North Central	1403 (9.6)
North East	2158 (14.8)
North West	4060 (27.8)
South East	1843 (12.6)
South South	2420 (16.6)
South West	2734 (18.7)

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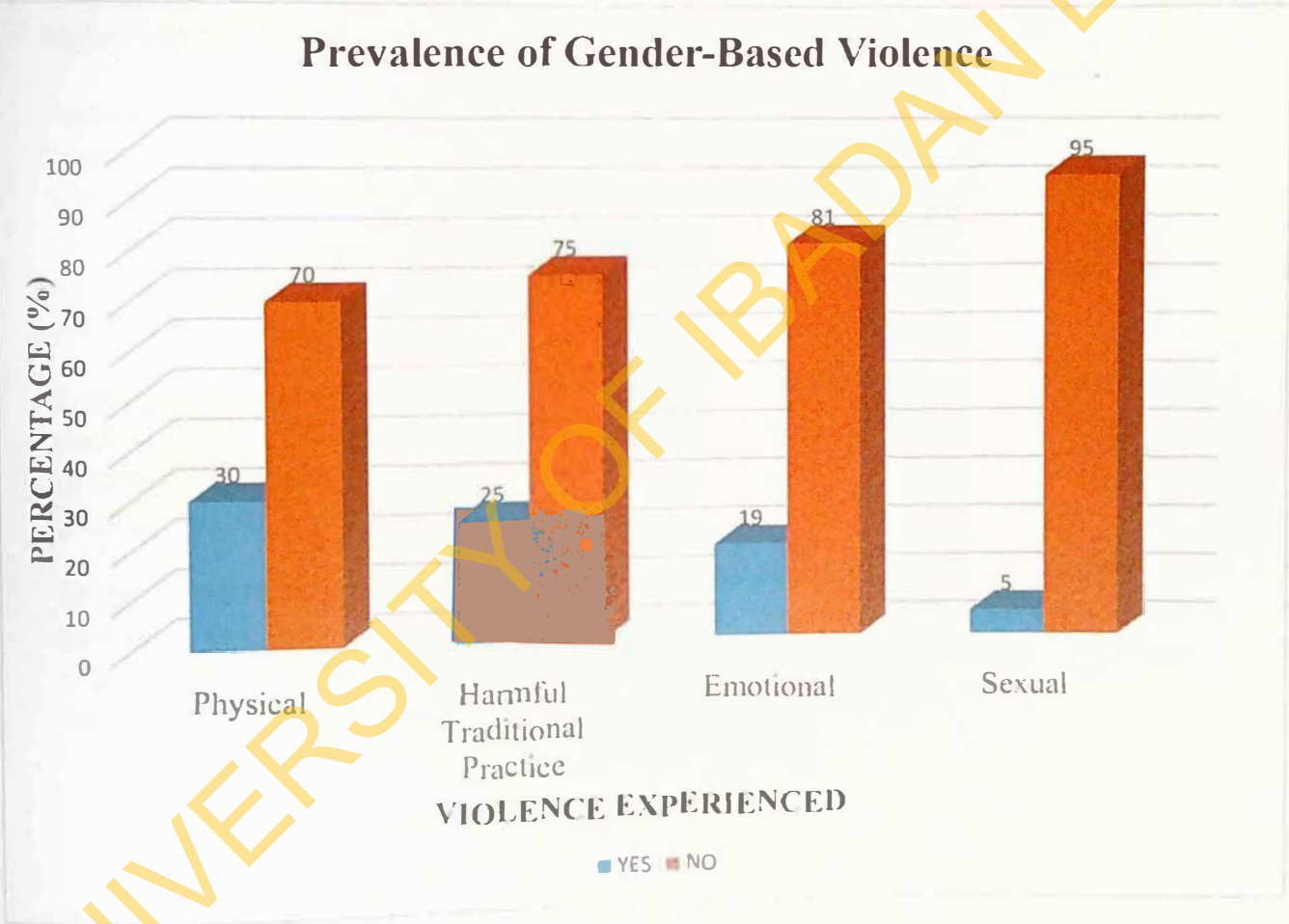
4.2 Prevalence of violence experienced

Figure. 1 revealed that out of 14,618 respondents recruited for the study, slightly above half (52.9%) reported to have experienced one or more forms of violence. Physical violence (30%) was most commonly reported, followed by harmful traditional practices (25%), emotional or psychological violence (19%) and sexual violence (5%).



4.3 Differences in Gender Based Violence experience in Nigeria on selected characteristics.

Table 4.4 shows the differences in Gender-Based Violence experience in Nigeria. The experience of GBV across selected age groups was slightly different in most of the age groups at first cohabitation. However, it was reportedly higher at age groups 24-25 (61.6%) and 25-29 (58.0%) years, ($p<0.001$).

It is worthy to note that GBV experience reported were similar among respondents in the primary (62.9%) and secondary cadre (62.8%). These groups had higher experience compared to those without educational attainment (38.9%), ($p<0.001$). However, the difference in experience was wide among various categories of literacy level, in that 44.7% for those who cannot read at all but higher with 87.5% for blind/visually impaired ($p<0.001$).

Furthermore, the difference in the experience of GBV was reportedly wide among respondents based on their marital status .The experience seems to be higher among those who are no longer with their partner (78.0%) compared to those who still lives with their partners (59.0%), ($p<0.001$). Likewise, the proportion of respondents whose partner indulge in smoking (68.3%) happens to suffer more of GBV experience compared to those whose partners do not smoke (47.7%), ($p=0.011$).

Similarly, as reported in Table 4.4, respondents whose partners engage in alcoholic behavior consumption (67.5%) experienced GBV more compared to those whose partners do not (48.5%), ($p<0.001$). Moreover, the experience increased with wealth quintile except for the richest quintile (58.0%), ($p<0.001$).

Urban dwellers had a higher GBV experience (60.9%) compared to rural dwellers (46.9%), ($p<0.001$). In addition, across the geo-political zones various significant differences were reported with the highest (74.3%) and least (34.4%) proportions of GBV experienced among the respondents for the South West and North West respectively ($P<0.001$).

Table 4.3: Differences in Gender Based Violence experience in Nigeria on selected characteristics.

FACTORS:	Characteristics	Gender-Based Violence		
		Yes	No	P-value
INDIVIDUAL	**Age at first cohabitation**			
	15-19	52.1	47.9	
	20-24	61.6	38.4	
	25-29	58.0	42.0	
	30-34	53.7	46.3	<0.001
	35-39	47.6	52.4	
	40-46	50.0	50.0	
	Highest Level of education			
	No education	38.9	61.1	
	Primary	62.9	37.1	<0.001
	Secondary	62.8	37.2	
	Higher	52.0	48.0	
	Literacy			
	Cannot read at all	44.7	55.3	
	Able to read parts of sentence	62.4	37.6	<0.001
	Able to read whole sentence	59.9	40.1	
	No card with required lang.	68.4	31.6	
	Blind/Visually impaired	87.5	12.5	
	Current marital status			
	Married	51.7	48.3	
	Living with partner	59.0	41.0	<0.001
	Widowed	60.0	40.0	
	Divorced	68.8	31.2	
	Separated/No longer with partner	78.0	22.0	
	Smoking			
	No	47.7	52.8	0.011
	Yes	68.3	31.7	
	Husband/Partner drink Alcohol			
	No	48.5	51.5	<0.001
	Yes	67.5	32.5	
HOUSEHOLD	**Religion**			
	Catholic	68.0	32.0	
	Other Christian	63.2	36.8	
	Islam	58.6	41.4	<0.001
	Traditional	70.3	29.7	
	Wealth Index			
	Poorest	37.7	62.3	
	Poorer	46.7	53.3	<0.001
	Middle	55.9	44.1	
	Richer	61.7	38.3	
	Richest	58.0	42.0	
COMMUNITY	**Type of Place of Residence**			
	Urban	60.9	39.1	<0.001
	Rural	46.9	53.1	
	Region			
	North Central	51.3	48.7	
	North East	39.4	60.6	
	North West	34.4	65.6	<0.001
	South East	72.9	27.1	
	South South	57.1	42.9	
	South West	74.3	25.7	

4.4 Multilevel Logistic Models of Gender-Based Violence among Women of reproductive age in Nigeria

Table 4.5 presents the fixed and random estimates for the unconditional (model 0), the model with level 1 fixed effect variables (model 1), the model with level 1 and level 2 fixed effect variables (model 2) and the full model (model 3) comprising fixed effect variables at levels 1,2 and 3.

4.4.1 The Unconditional Model

In the absence of any predictor or factor but conditioned to the household and community random effect, the value of the intercept (1.01) was not significant (OR=1.01, 95%CI: 0.86-1.18).

A variance of 4.87 at the household level implied an ICC of 0.78 for observations collected on the same participants; this implies that there was an estimate of 78% correlation of the 'closeness' of observations on the same participant relative to closeness of observations on different participants within the same area.

Similarly, a variance of 6.92 at the community level implied that an ICC of 0.32 for households in the same community; this means 32% differences in the effect of GBV among women within the reproductive age attributable to the differences between the communities. The deviance (-2LL) of this model was 15705.91 (Table 4).

4.4.2 Model with Level 1 Characteristics

When all fixed effects variables at level 1 i.e. age at first cohabitation, highest educational level, current marital status, literacy level, partner/husband alcohol use and smoking habit were all included in unconditional model , the value of the intercept decreased to 0.95 with evidence of statistically insignificant (OR=0.95, 95%CI: 0.79-1.14).

All other categories in the level of education attainment except for the higher level category was significant associated with GBV, as shown in Table 4.4. Compared to respondents in the no education category, there were 38% (OR=1.32, 95%CI: 1.17-1.64) and 49% (OR=1.49, 95%CI: 1.05-2.11) increased risk of GBV experience for primary and secondary respectively. This was statistically significant for primary and secondary educational level groups.

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Gender-Based Violence experience was approximately lower 1% (OR=0.99, 95%CI: 0.78-1.25) among the widowed when compared with married participants belonging to the same community. Divorced and separated/no longer with partner groups were about 4 and 3 times more likely (OR=3.82, 95%CI: 2.49-5.84) and (OR=3.16, 95%CI: 2.14-4.64) to experience GBV when compared with married respondents. This association was statistically significant.

It is perhaps worthy to know that there was no statistically significant association between literacy level and GBV as reported in Table 4.4. Compared to respondents who cannot read at all to respondents who are able to read parts of a sentence, the risk of GBV experience was higher by 2% (OR=1.02, 95%CI: 0.84-1.24). Similarly respondents who are able to read a whole sentence had an 18% decrease in experiencing GBV (OR=0.82, 95%CI: 0.59-1.12). The experience of GBV was 2.3 (OR=2.29, 95%CI: 0.68-7.60) and 9 (OR=8.54, 95%CI: 0.80-90.44) times more likely among respondents who were blind/visually impaired living within the same community.

Taking into consideration the age at first cohabitation, the risk of experiencing GBV was lower by, 11% in the age group 20-24 years compared with those between 15-19 years(0.71 (0.59-0.85)) and similarly reported across the age groups. This was significant with age groups 25-29 and 30-34 years.

There was an increased risk of 6% GBV experience among respondents whose husband or partner were involved in the habit of smoking compared to respondents whose husband or partner does not involve in such act in the same community (OR=1.06, 95%CI: 0.53-2.11). This association was not statistically significant.

Also reported, GBV experience was increased by 56% among respondents whose husband/partner drinks alcohol compared to women whose husband/partners does not drink alcohol belonging to the same community (OR=1.56, 95%CI: 1.38-2.11). This association was not statistically significant.

A variance of $4.93e^{-08}$ at the household level implied an ICC of 0.51 for observations collected on the same participants; this implied there was a 51% correlation in the 'closeness' of observations on the same participant relative to closeness of observations on a different participant within the same area.

Similarly, a variance 3.39 at the community level implied an ICC of $7.3811e^{-8}$ for households in the same community; this suggests that <1% (i.e. extremely small difference in the effect of GBV among respondents) were attributable to the differences between the communities.

Addition of level 1 variables to model 0, the deviance (-2LL) reduced from 15705.91 in model 0 to 15390.94 in model 1, meaning that this model fitted the data better than the previous one.

4.4.3 Model Adjusted for Religion and Wealth Index

When model 2 was adjusted for religion and wealth index, the value of the intercept, which increased to 1.13 which was not statistically significant (OR=1.13, 95%CI: 0.84-1.52).

Except for the fact that respondents whose husband/partner drinks alcohol compared with respondents whose husband/partners belonging to the same community were now 49% more likely to report GBV (OR=1.49, 95%CI: 1.31-1.68) consequently the association became statistically significant.

Women within the reproductive age were less likely to experience any form GBV when compared with age group 15-19 years at the community level. This experience was much lower across all age groups in the model 2 compared to previous models was a significant increase in age groups. It was observed that the effect of each level 1 variables such as literacy level, smoking, educational attainment and current marital status were still the same in model 1.

However, compared catholic with other religious categories in the same community, were 8% (OR=0.93, 95%CI: 0.77-1.10), 33% (OR=0.67, 95%CI: 0.52-0.83) and 43% (OR=0.57, 95%CI: 0.30-1.06) less likely to suffer any experience of GBV among other Christian, Islam and other groups while the risk of GBV experience increased by 27% among respondents age who are traditional worshippers. Islam was statistically significant.

The variances reported for both household and community levels in this model were $4.80e^{-10}$ and 3.18 while ICC was 0.49 and $7.42e^{-11}$ respectively in model 2. Moreover, the deviance (-2LL) from 15390.94 in model 1 decreased to 15369.90 in model 2, meaning this model fitted the data better than the previous one.

4.4.4 Model Adjusted for Place of Residence and Region

When model 3 was adjusted for residence and region, the value of the intercept further increased to 1.41, which was not statistically significant (OR=1.41, 95%CI: 0.88-2.25).

In this model, the effect of each level 1 and 2 variables was very similar to model 2 in terms of the significance in the relationship with GBV.

However, there was a statistically significant association in the relationship between place of residence and GBV. There was 29.0% less likely chance of suffering GBV among respondents living in the rural compared to those at the urban settlement.

Respondents in the North East when compared with those from North Central, was reported to be 25% less likely to experience GBV (OR=0.75, 95%CI: 0.48-1.17) which was statistically significant. However, 68% of the respondents are less likely to experience GBV in the North West (OR=0.32, 95%CI: 0.20-0.48). Respondents belonging to the geopolitical zones South East, South South and South West respectively were 4.1 (OR=4.09, 95%CI: 2.59-6.44), 1.5 (OR=1.46, 95%CI: 0.95-2.24) and 4.7 (OR=4.68, 95%CI: 3.07-7.12) times more likely to experience GBV when compared with North Central. North East, South East and South West were statistically significant.

Furthermore, the deviance (-2LL) decreased from 15369.90 in model 2 to 15154.70 in model 3, meaning that this model fitted the data better than the previous one. Therefore, this model best explained the study (Table 4.4).

Table 4.4: Multilevel Logistic Models of GBV among women of reproductive age in Nigeria

FIXED PART	MODEL 0 OR (95%CI)	MODEL 1 OR (95%CI)	MODEL 2 OR (95%CI)	MODEL 3 OR (95%CI)
Individual Variables				
Age at first cohabitation				
15-19		**Reference**	**Reference**	**Reference**
20-24		0.85 (0.73-0.99)*	0.83 (0.71-0.96)*	0.76 (0.65-0.88)*
25-29		0.71 (0.59-0.85)*	0.68 (0.56-0.82)*	0.62 (0.51-0.74)*
30-34		0.73 (0.54-0.98)*	0.69 (0.51-0.92)*	0.63 (0.46-0.84)*
35-39		0.88 (0.47-1.64)	0.82 (0.43-1.53)	0.71 (0.37-1.32)
40-46		0.52 (0.18-1.50)	0.49 (0.16-1.42)	0.45 (0.15-1.29)
Highest Level of education				
No education		**Reference**	**Reference**	**Reference**
Primary		1.38(1.17-1.64)*	1.32 (1.11-1.56)*	1.17 (0.98-1.38)
Secondary		1.49(1.05-2.11)*	1.38 (0.97-1.96)*	1.22 (0.86-1.74)
Higher		1.00(0.68-1.45)	0.90 (0.61-1.30)	0.82 (0.56-1.20)
Literacy				
Cannot read at all		**Reference**	**Reference**	**Reference**
Able to read parts of sentence		1.02 (0.84-1.24)	1.00 (0.82-1.22)	1.00 (0.81-1.21)
Able to read whole sentence		0.82 (0.60-1.13)	0.79 (0.57-1.09)	0.80 (0.57-1.09)
No card with required lang.		2.29 (0.69-7.60)	2.30 (0.70-7.58)	2.27 (0.68-7.50)
Blind/Visually impaired		8.54 (0.81-90.4)	7.56 (0.72-79.2)	7.65 (0.73-79.2)
Current marital status				
Married		**Reference**	**Reference**	**Reference**
Living with partner		0.96 (0.77-1.19)	0.95 (0.76-1.18)	0.92 (0.73-1.14)
Widowed		0.99 (0.78-1.26)	0.97 (0.76-1.23)	0.90 (0.70-1.14)
Divorced		3.82 (2.49-5.85)*	3.81 (2.49-5.85)*	3.76 (2.45-5.75)*
Separated/No longer with partner		3.16 (2.15-4.65)*	3.13 (2.13-4.60)*	2.92 (1.99-4.29)*
Smoking				
No		**Reference**	**Reference**	**Reference**
Yes		1.06 (0.53-2.11)	1.03 (0.52-2.06)	1.01 (0.50-1.99)
Husband/Partner drinks Alcohol				
No		**Reference**	**Reference**	**Reference**

Yes		1.56 (0.79-1.14)	1.49 (1.32-1.69)*	1.42 (1.25-1.60)*
Household Variables				
Religion				
Catholic			**Reference**	**Reference**
Other Christian			0.92 (0.77-1.10)	0.95 (0.79-1.14)
Islam			0.67 (0.52-0.83)*	0.93 (0.72-1.17)
Traditional			1.27 (0.68-2.36)	1.45 (0.77-2.72)
Other			0.57 (0.30-1.06)	0.69 (0.37-1.29)
Wealth Index				
Poorest			**Reference**	**Reference**
Poorer			1.01 (0.84-1.20)	0.92 (0.77-1.09)
Middle			1.12 (0.90-1.38)	0.87 (0.70-1.07)
Richer			1.25 (0.98-1.57)	0.84 (0.66-1.07)
Richest			1.13 (0.95-1.59)	0.77 (0.58-1.01)
Community Variables				
Type of Place of Residence				**Reference**
Urban				0.71 (0.54-0.92)*
Rural				
Region				
North Central				**Reference**
North East				0.75 (0.48-1.17)
North West				0.32 (0.20-0.48)*
South East				4.09 (2.59-6.44)*
South South				1.46 (0.95-2.24)
South West				4.68 (3.07-7.12)*
Intercept	1.01 (0.86-1.18)	0.95 (0.79-1.14)	1.13 (0.84-1.52)	1.41 (0.89-2.25)
RANDOM PART				
Household variance σ_u^2 (SE)	4.47 (13.23)	$4.93e^{-08}$ (0.00002)	$4.80e^{-10}$ (0.00002)	$3.11e^{-10}$ (0.00002)
Community Variance σ_v^2 (SE)	6.92 (12.00)	3.39 (0.23)	3.18 (0.22)	2.53 (0.17)
ρ (household, com.)	0.78	0.51	0.49	0.44
ρ (community)	0.32	$7.3811e^{-8}$	$7.42e^{-11}$	$5.33e^{-11}$
Deviance (-2LL)	15705.9108	15390.9366	15369.9022	15154.6978

*p<0.05; and LL implies Log Likelihood Estimate

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion

This study investigated and assessed individual, household and community factors associated with experience of GBV among women of reproductive age (15-49 years) in Nigeria.

The findings in this study showed that the prevalence of experiencing any form of violence among women of reproductive age was high. This prevalence was similar to the prevalence of 60% reported by UNFPA, (2002). This finding is also in agreement with the estimated prevalence range of 13 and 61% global violation among women WHO, (2005). However, it was higher than what was reported (48%) from a study conducted among Indian women of reproductive age in Nepal Kathmandu, (Government of Nepal, 2012). A prevalence of 58.8% reported by a study in northern Nigeria (Zubairu Iliyasu et al, 2011) and likewise 68.1% among women in Lagos, Nigeria (Odujirin, 1999) were findings which revealed the extent of GBV risk in the southern and northern parts of Nigeria.

According to the report from this study, the experience of violence varies with the educational background of women such that those with no education suffered less violation as compared with their educated counterparts. This is agrees with a similar study on gender-based violence and pregnancy outcomes among couples and cohabitating partners in Nigeria which revealed that GBV is a common scenario among those who seems to be educated compared to their counterparts who happens not to be educated (Gbolahan et al, 2016). This corroborates the reports of a study among women within the reproductive age in South Africa which reported that women with no education experienced less violation compared to educated women (Jewkes and Abrahams, 2002). Nevertheless our findings contradicts report from Ghana which documented that educated women experienced less violence compared to uneducated counterparts (Tenkorang et al., 2013), which might have been due to the difference in the system of education employed by both countries and the role of concerned agencies on the enlightening of citizens and strict punishment on the culprit of this offence.

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Gender-Based Violence experience as reported in this study was extremely high among women who are visually impaired compared to their counterparts. This supports a report by European Union Agency for Fundamental Rights (2014) which stated 34% of women with disability experience violation compare to 19% who are visually good.

This study shows that marital status as a factor was associated with GBV. It revealed that GBV was common among women who are no more with their partners compared to women who still lives with their partner. This was similarly reported in the study conducted in Nigeria by Omideyi, (2011), that high proportion of women separated from their partner experienced GBV compared to those who are still married to their partners. This on the other-hand might be responsible for their present marital position.

Women whose partner drinks alcohol actually experienced more violation as reported from this study. This agrees with several reports from Indonesia, Nicaragua, South Africa, Spain and Venezuela. These reports established a relationship between a woman's risk of experiencing violence and partner's drinking habits (Ellsberg MC, 2000; INCLEAN, 2000; Oladepo et al., 2011; kiss et al, 2012; Berg et al., 2010; Pandey et al, 2009; Soler et al., 2000; Fawole et al., 2012; Tenkorang et al, 2013; Gbolahan et al., 2016). This is not very surprising as alcohol use has been linked to aggressive and violent behavior (Angelucci, 2008). Alcohol consumption by partners is commonly associated with Gender-based Violence and pregnancy in Africa (Fawole et al., 2008; Agbo and Choji, 2014; Ononokpono et al., 2014; Simona et al., 2015).

The risk was not as high as estimated by previous studies, however this study disclosed that GBV was twice likely to occur among those whose partner drinks alcohol compared to women who lived with non-drinkers, which was similarly reported by a study in South Africa on GBV, alcohol use, sexual risk among female patrons (Eileen V. Pitpitan et al., 2013). In Canada, women who lived with heavy drinkers were five times more likely to be assaulted by their partners than those who lived with non-drinkers (Rogers, 1994).

The influence of smoking was not reportedly associated with GBV when analysed. This contradicts the findings of Oladepo et al., 2011); a study conducted on men and women in selected states in Nigeria on factors influencing Gender Based Violence which reported that females whose partners smoked also had a higher risk of experiencing violence (Oladepo et al,

2011) and a report from a study conducted by (Julianna et al., 2016) in Ohio Appalachia which documented that GBV exposure index was associated with smoking behavior.

Wealth has been implicated in GBV experience, as our findings also showed that Gender-Based Violence was higher among women from rich household compared to women from poor households. This was in agreement with a findings conducted on similar group of women in Kenya (Samson and Clifford, 2014). This report differs from a Uganda study which described the prevalence of GBV experience among women in the highest wealth quintile was less than half of the level among those in the lowest wealth quintile (kishor and Bradley, 2012).

Location happens to be of importance when looking at difference in GBV experience among women. Women in the urban reported higher rate of violence experience compared to their counterparts in the rural. This corroborate a study on gender-based violence and pregnancy outcomes among couples and cohabitating partners in Nigeria which documented that GBV experience is protective among women in the rural part of Nigeria compared with the women residing in the urban location (Gbolahan et al, 2016). This supported the study conducted that women in four out of the seven countries residing in rural areas were less likely to experience violence as compared to their counterparts in the urban areas (Kishor and Johnson 2004). A study from the Philippines shows that living in urban slums can lead to a greater incidence of violence against women, especially that perpetrated by someone who is not a partner (McIlwaine, 2013).

Our findings further revealed that there are regional distribution in the experience of GBV among women of reproductive age. Higher prevalence was revealed in southern Nigeria compared to their counterparts in the northern part. This agrees with a study on Gender-based violence conducted on women across Nigeria (Omideyi et al., 2011). This is in agreement with a study on factors related with GBV in southeast, Nigeria where 70% of the respondents reported to have witnessed abuse in the family with female victims at 92% (Gbolahan et al, 2016).

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. Factors such as religion, smoking, wealth index, literacy level etc. which showed significant associations in bivariate analysis vanished in the multilevel regression analysis. Although intra-class correlations

were average, nevertheless, they indicate inherent dependencies in data structure. However, the variations in outcome of interest (Gender Based violence) may have been explained by the measured characteristics alone.

Moreover, after controlling for household and community level factors, there was still an influence of GBV on women who no longer lives with partner had a higher prevalence which might have been cause of their marital status. Strong association in the southern parts of Nigeria as compared to their northerners which might be due to variation in their geographical distribution.

LIMITATION OF THE STUDY

The deficiency of some variables of interest such as female genital mutilation experience had lots of missing data.

CONCLUSION

Combining stages such as individual, household and community-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. The model showed strong presence of GBV among women in southern, Nigeria.

RECOMMENDATION

There should be active act from responsible agencies towards the laws which caution the citizens against violation in the society. In addition, places where this act are most rampant should be placed under surveillance in other to eliminate the causes of this behavior. There should be more studies on the prevalence of GBV experience with inclusion factors which are important but missing in previous researches.

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