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Abstract

Purpose – *The purpose of this paper is to investigate the relationship between child sexual abuse and sexual risk behaviours as well as its potential mediators.*

Design/methodology/approach – *This cross-sectional study used data from a cross-sectional study from 12,800 women between 15 and 49 years of age included in the 2008 Nigerian Demographic and Health Survey. Structural equation modelling (SEM) was applied to assess the association between childhood sexual abuse (CSA) and sexual risk behaviours.*

Findings – *The authors found that CSA was directly associated with sexual risk behaviours. In addition, the association between CSA and sexual risk behaviour was also partially mediated by alcohol and cigarette use.*

Research limitations/implications – *The results show that being abused in childhood is important for the subsequent development of sexual risk behaviours in adulthood and the association is mediated by alcohol and cigarette use.*

Practical implications – *The results may be helpful for policy makers and health care planners in designing cultural sensitive public health intervention that will reduce the burden of CSA, its long-term effects (sexual risk behaviours) and intervening mediators that increase the risks.*

Social implications – *These findings suggest that to reduce sexual risks, interventions to address sexual abuse needs to include other social problems (smoking, alcohol) that victims result to when faced with trauma.*

Originality/value – *The current study is the only one so far in sub-Saharan Africa to have explored the relation between CSA and sexual risk behaviours using SEM.*

Keywords *Alcohol, Structural equation modelling, Sub-Saharan Africa, Smoking, Childhood sexual abuse, Sexual risk behaviours*

Paper type *Research paper*

Background

Childhood sexual abuse (CSA) of girls is a public health problem and an issue of great concern in sub-Saharan Africa (SSA). The World Health Organisation (WHO) Global School-based Student Survey conducted in SSA estimates the prevalence of CSA to be between 9 and 33 per cent (Brown *et al.*, 2009). CSA is predominantly more common among the female sex than their male counterparts and the perpetrators of this crime are usually men of an older age group (Lalor, 2004). There has been well-documented negative sequelae of CSA, which ranges from drug abuse, physical abuse, mental health problems, difficulties with sexual relationships and engaging in sexual risk behaviours (Browne and Finkelhor, 1986; Dinwiddie *et al.*, 2000; Fergusson *et al.*, 1996, 1997; Peltzer *et al.*, 2013; Senn *et al.*, 2008). A growing number of studies indicate that those who were sexually abused in childhood often engage in behaviours

(earlier age of first consensual sex, engaged in commercial sex work, higher numbers of sexual partners, unprotected sex) that carry risk for human immunodeficiency virus (HIV) and other sexually transmitted diseases (STDs) (Arriola *et al.*, 2005; Browne and Finkelhor, 1986; Thompson *et al.*, 1997; Wyatt, 1988; Zierler *et al.*, 1991). Sexual risk behaviours lead to more problems in life, ranging from STDs including HIV, infertility and breakdown of marital homes. Knowledge of the magnitude of such problems is indeed essential for its prevention. The spread/prevention of STDs depends on an individual's assessment of the risk of infection and the subsequent judgement of whether that risk should influence sexual behaviour. To reduce the risks of STDs including HIV and its burden, it is essential that effective preventive strategies are adopted. Such measures are practical when there is an understanding of conditions such as CSA, which can either directly or indirectly influence conditions or behaviours that will increase high sexual risk behaviours.

Evidence suggests that adult sexual behaviour is influenced and predicted by the experiences during childhood and adolescent sexual development (Purcell *et al.*, 2008). While CSA may be considered as one of many childhood and adolescent experiences that influence adult sexual behaviour, it can nonetheless precipitate rapid sexual development (Purcell *et al.*, 2008). Miller and colleagues (Miller, 1999) attributed the relationship between CSA and sexual risk behaviours to three things: the initiation of and/or increasing reliance on drug use as a method of coping with sexual abuse experience, problems with sexual adjustment that may be related to sexual risk taking, and psychopathology, which may increase the likelihood of the individual participating in sexual risk behaviours.

Though there are existing studies that had looked at the association between CSA and subsequent risky sexual behaviours. However, most of these studies were from high-income countries. To the best of our knowledge, to date, only few studies had examined this association from SSA's perspective (Peltzer *et al.*, 2013; Richter *et al.*, 2013). Furthermore, there is no existing study from SSA that had examined the potential mediating pathways between exposure to CSA and subsequent risky sexual behaviours. Therefore, the overarching aim of the study was to fill this research gap by assessing the relationship between child sexual abuse and sexual risk behaviour as well as potential mediators using national representative and population-based survey data from Nigeria.

Our hypotheses were as follows:

H1. Women with a history of CSA will report cigarette and alcohol use.

H2. Women with a history of CSA will report engaging in sexual risk behaviours, including lack of condom use with non-spousal partners, engage in extramarital sex and have higher rates of STDs.

H3. The association between history of CSA and sexual risk behaviours will be mediated by alcohol and cigarettes.

Methods

Setting

Nigeria is located in West Africa and is bordered in the north by Niger, in the south by the Atlantic Ocean, in the west by the Republic of Benin and in the east by Cameroon. Nigeria has a total area of 923,768 square kilometres (km). It has a population of 168,833,776 according to the latest The World Bank Group's (2013) data, making it the most populous country in Africa. The population is distributed as 48.3 per cent urban and 51.7 per cent rural and a population density of 180 people per km^2. Nigeria has over 500 ethnic groups with the three main ethnic groups being Hausa/Fulani, Yoruba and Igbo.

The estimated prevalence of HIV among adults between the ages of 15 and 49 years in Nigeria was 3.1 per cent in 2012 (UNAIDS, 2013), and it varies greatly by geo-political zone. Of the 25 million people with HIV in SSA, Nigeria accounts for 3.4 million (UNAIDS, 2013). This makes Nigeria the second highest burden of HIV and AIDS in the world after South Africa.

Females account for 1.3 per cent of young people aged 15-24 living with HIV while 0.7 per cent are male. Sexual intercourse remains the most common mode of HIV transmission.

Study design

The study was a cross-sectional design and it used data from the 2008 Nigerian Demographic and Health Survey (DHS). DHS surveys are usually well conducted with a high response rate. They are designed to collect good quality, nationally representative data on demographic and health indicators of women and members of their households in countries lacking good register data. Methods and data collection procedures have been published elsewhere (ICF International, 2012). This survey used a two-stage cluster sampling design, using strata for rural and urban areas and for different regions of the countries. This ensures that the sample is generally representative at all levels (national, residence and regional levels). Administratively, Nigeria was divided into 36 states and the federal capital Abuja, with each state subdivided into local government areas (LGAs). Each of the LGAs was further divided into localities. In addition, each of the localities was further divided into convenient areas called census enumeration areas (EAs) during the Nigerian population census in 2006. The primary sampling unit (PSU), a cluster, for the 2008 NDHS was defined on the basis of the EAs from the 2006 EA's census frame. The sample was selected using a stratified two-stage cluster design consisting of 888 clusters, 286 in the urban and 602 in the rural areas.

The first stage involved selecting 888 clusters, otherwise known as PSUs. The second stage involved sampling of households from an updated list of households within each EA. Within each state, the number of households was distributed proportionately among its urban and rural areas. A female participant (aged between 15 and 49 years) is randomly selected for the violence module. A standardised questionnaire was administered by interviewers to all female participants aged between 15 and 49 years in the selected households.

Data collection

Data collection procedures have been published elsewhere (National Population Commission & ICF Macro, 2009). Briefly, data were collected by visiting households and conducting face-to-face interviews to obtain information on demographic characteristics, wealth, anthropometry, HIV knowledge, sexual behaviour and domestic violence. Women of reproductive age (15-49) are the focus of the survey. In total, three standard core questionnaires (household, woman and man) are included in the survey. In addition to the core questionnaires are also standardised modules not contained in the core questionnaires designed for countries with interest in those topics. Such topics include: maternal mortality, domestic violence, malaria and HIV/AIDS. This study utilised the advantage of the DHS domestic violence module to collect and analyse data on violence against girls.

Interviewers were well trained and received special training to ensure good professional standards throughout the entire process. In any household, only one woman should receive the domestic violence module and the Kish grid is used to randomly select one woman from the eligible women in the household. Only female interviewers are allowed to interview female respondents in the domestic violence module and strict privacy is ensured during the entire interview. Before starting the interview, additional informed consent is obtained for the violence module and respondents are reassured of the confidentiality of the information.

Ethical consideration

This study was based on an analysis of existing survey data with all identifier information removed. The survey was approved by the Ethics Committee of the ICF Macro at Calverton in the USA and by the National Ethics Committee in the Ministry of Health in Nigeria. All study participants gave informed consent before participation and all information was collected confidentially (National Population Commission & ICF Macro, 2009).

Variables

This sample was obtained from eligible women aged between 15 and 49 years who were administered the domestic violence module and completed the questions related to CSA. This

subgroup was used for analysis in which CSA was the independent variable (IV), sexual risk behaviours, comprising of lack of condom use, extramarital sex and STDs in the last 12 months, was the outcome variable, while cigarette and alcohol use were the mediators. Although there are potential mediators to be used in this study, the only mediating variables available from the DHS to suits this study were alcohol and cigarette use.

CSA. CSA was defined as sexual violence on or before the age of 18 years. To assess if participants were sexually abused in childhood, all eligible women were asked the following questions: "At any time in your life, as a child or as an adult, has anyone forced you in any way to have sexual intercourse or perform any other sexual acts?" The two possible outcomes for the questions were "yes" or "no". Respondents who said yes were then asked questions about the age at which this first happened and the person who committed the act. Respondents who gave an affirmative reply and if the violence occurred when they were under the age of 18 years, were considered as cases of CSA and coded as "1" while those who gave a negative response or if the abuse occurred after the age of 18 years, formed the other group of the dichotomy and were coded "0". All women who did not respond to the question were excluded.

Cigarette use. The respondents answered questions about their tobacco use habits by identifying if they currently consumed cigarettes (yes/no).

Alcohol use. Alcohol use was defined as the act of drinking alcohol before the last sexual intercourse. The amount of alcohol consumed by the participant was not quantified. But rather, four categories were identified, namely:

1. neither the respondent nor the partner consumed alcohol before the last sex;
2. the respondent consumed alcohol but the sexual partner did not;
3. the sexual partner consumed alcohol but the respondent did not; and
4. both the respondent and the sexual partner consumed alcohol.

A binary outcome variable was created for alcohol use, coded as "0" if the respondent did not drink alcohol and coded "1" if the respondent consumed alcohol at least in one situation.

Sexual risk behaviours. Sexual risk behaviour is a latent variable and was constructed from three variables: lack of condom use with non-spousal partner, extramarital sex and history of STD in the last 12 months. We defined extramarital sex as the act of having sexual intercourse with a man other than one's spouse or cohabitating sexual partner. Latent variable is a variable that are not directly measured but are rather inferred from directly measured variables.

Statistical analyses

Descriptive statistics were used to describe demographic characteristics within the study sample. The correlations between variables were identified using Pearson's product moment correlation. Following a two-step approach recommended by Anderson and Gerbing (1992, 1998), the first step involved a confirmatory factor analysis to develop an acceptable measurement model. The measurement model defined the observed variables in terms of "true" latent variables (endogenous or exogenous) and a measurement error term. At this stage, each latent variable was allowed to correlate freely with every other latent variable. In step two, the measurement model was modified to represent the postulated causal model framework. A mediator (M) (i.e. alcohol and cigarette use) or an intervening variable is a third variable that links the IV (CSA) to the dependent variable (DV) (sexual risk behaviours) (Baron and Kenny, 1986). The indirect effect involves the direct effects of the IV on M and from M to DV, while the total effect is denoted as the sum of the direct effect of IV on DV and the indirect effect.

Model fit diagnosis

We conducted model testing with the Stata for Windows version 12.1. We evaluated model fit by examining the following fit indicators, using criteria suggested by Hu and Bentler (1999). These include examination of χ^2 statistics, a comparative fit index, a Tucker-Lewis index and a root mean square error of approximation. The χ^2 statistics indicate the correspondence between the proposed model and data. The root mean square error approximation is a measure of the

error of approximation between hypothesised model-implied covariance matrix in the sample and the population covariance matrix. The comparative fit index assessed the improvement in fit of the hypothesised model compared with a baseline model (i.e. null model), when covariances among the population are assumed to be zero. The Tucker-Lewis index corrects for model complexity, favouring parsimonious models over more complex ones. Values for the root mean square error approximation ranging from 0 to 0.05 and for comparative fit index and Tucker-Lewis index above 0.90 and 0.95, respectively, represent acceptable fit of the model.

Results

Sample characteristics

The study analysed 12,800 women sampled in Nigerian DHS 2008. Table I shows the summary characteristics of the respondents. About 2 per cent of the women reported a history of CSA. About 1.5 per cent of the responded reported history of STD in the last 12 months prior to the survey; 0.5 per cent of the respondents did not use condoms in the last sexual intercourse with non-spousal partner. In total, 13 per cent of the respondents reported extramarital sex. Only one per cent of the respondents reported use of cigarette and alcohol. As shown in Table II, all of the variables were found to be significantly and positively correlated (ranged from 0.0258 to 0.1796).

Measurement and path models

In the measurement model, the confirmatory factor analyses indicated that the measurement model for high sexual risk behaviours had a satisfactory fit. All factor loadings were significant

Table I Distribution of the sample, Nigerian DHS 2008

	Number	*%*
Childhood sexual abuse		
Yes	224	1.7
No	12,577	98.3
Sexually transmitted diseases		
Yes	198	1.5
No	12,603	98.5
Lack of condom use		
Yes	60	0.5
No	12,740	99.5
Extramarital sex		
Yes	1,630	12.7
No	11,170	87.3
Alcohol or cigarette use		
Yes	142	1.1
No	12,658	98.9

Table II Pearson's correlations between study variables

	Childhood sexual abuse	*Sexually transmitted diseases*	*Lack of condom use*	*Extramarital sex*	*Alcohol or cigarette use*
Childhood sexual abuse	1				
Sexually transmitted diseases	0.027**	1			
Lack of condom use	0.0258**	0.0750***	1		
Extramarital sex	0.0656***	0.0360***	0.1796***	1	
Alcohol or cigarette use	0.0372***	0.0352***	0.0692***	0.1229***	1

Notes: $^{**}p < 0.001$; $^{***}p < 0.0001$

with values: lack of condom use ($\beta = 0.61$, $p < 0.0001$), extramarital sex ($\beta = 0.29$, $p < 0.0001$), and history of STD ($\beta = 0.12$, $p < 0.0001$).

Regarding the Path model, the final structural equation model (see Figure 1) demonstrated a good model fit to the data (RMSEA = 0.025, CFI = 0.958, TLI = 0.896). As shown in Figure 1, the final model revealed that the women who had experienced CSA were more likely to drink alcohol and smoke cigarettes, and more likely to engage in sexual risk behaviours. Those that reported using alcohol and smoking cigarettes were also more likely to engage in sexual risk behaviours.

Testing the mediation effect

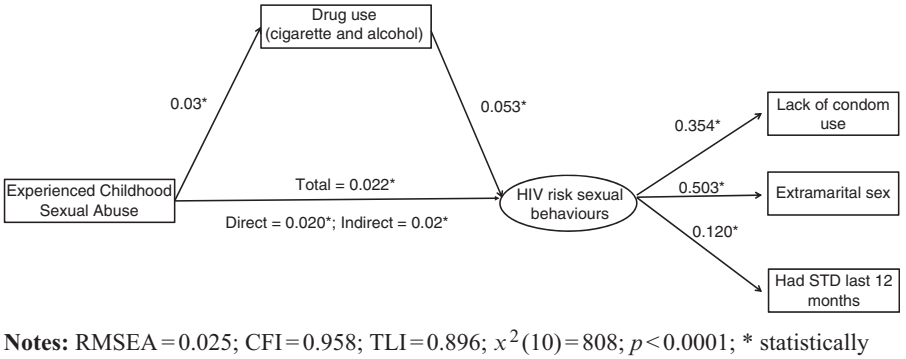
The total effect of child sexual abuse on sexual risk behaviours was statistically significant ($\beta = 0.022$, $p < 0.0001$), i.e. the effect we would find if there was no mediator in our model. Child sexual abuse had a significant direct effect on high sexual risk behaviours ($\beta = 0.020$, $p < 0.0001$). The indirect effect of child sexual abuse that passes through the alternate pathway (alcohol consumption and cigarette smoking), while significant ($\beta = 0.002$, $p < 0.0001$), it was much smaller than the direct effect. The percentage of the total effect mediated was just 7.3 per cent. These results indicate that CSA predicted on sexual risk behaviours both directly and indirectly through the use of alcohol and cigarettes, though the effect is partially moderated.

Discussion

Main findings

This study examined the effects of history of CSA on sexual risk behaviours. In total, three major findings emerged from this study. First, women with a history of CSA reported using cigarettes and alcohol. This is consistent with previous studies that found that CSA is associated with alcohol and cigarette use (Malow *et al.*, 2006b; Meade *et al.*, 2012; Senn *et al.*, 2008). Although, the use of alcohol is common among adolescents and it occurs for a range of reasons, the reason for drug and alcohol use in adolescents with a history of sexual abuse is to avoid abuse-specific memories and affective responses (Briere and Runtz, 1991, 1993). Second, our hypothesis that women with a history of CSA were more likely to report sexual risk behaviours was confirmed. The present findings support earlier work linking CSA and sexual risk behaviours in adulthood and are in accordance with both empirical findings and theory (Holmes *et al.*, 2005; Miller, 1999). It is thought that women with sexual abuse histories place themselves at HIV risk through sexual behaviours linked to beliefs about sexuality developed in response to sexual abuse (Miller, 1999). While several studies have found an association between CSA and sexual risk behaviour in adulthood (Arriola *et al.*, 2005; Miller, 1999; Richter *et al.*, 2013; Senn *et al.*, 2006; Senn and Carey, 2010), some studies have not found any association (Peltzer *et al.*, 2013).

Figure 1 Model pathway of the association between child sexual abuse and sexual risk behaviours



Notes: RMSEA = 0.025; CFI = 0.958; TLI = 0.896; $x^2(10) = 808$; $p < 0.0001$; * statistically significant

It is difficult to know why some of these studies were not significant, but possible reasons may be because the studies were not adequately powered to detect any association, or it may have been the way CSA and sexual risk behaviours were operationalized.

Of particular interest in this study was that the association between CSA and riskier sexual behaviours was partially mediated by alcohol use and cigarette smoking. In fact, history of CSA was associated with sexual risk behaviour both directly and indirectly through drug use. Though preponderance, i.e. 93 per cent of the total effect of the association was via direct route. The findings from this study were similar to previous studies on CSA and sexual risk behaviour (Senn *et al.*, 2012). Many studies have shown the adverse effects of sexual abuse on later behaviours (e.g. substance abuse, alcohol, use of control medications). Likewise, studies have shown the adverse impacts of substance abuse on sexual risk behaviour in later life. It is also well documented that victims of CSA may have maladaptive emotional or behavioural problems like depression, which may also be further associated with sexual risk taking. While alcohol, cigarette smoking and other recreational drugs had been used as coping mechanism following traumatic effect of sexual abuse, it further impairs judgement regarding safe sexual practice (Zawacki *et al.*, 2009). This further limits the ability to successfully negotiate condom use, increase likelihood of multiple sexual partners, which will subsequently increase the risk of exposure to STDs including HIV. Findings from this study also corroborate existing knowledge regarding the association between CSA and sexual risk behaviour in SSA. Existing research on CSA in SSA has been limited and primarily focused on cross-sectional data using logistic regression techniques. No study has attempted to utilise the structural equation modelling (SEM) technique.

Study limitations and strengths

There are certain study limitations that should be acknowledged. First, because the data were drawn from national surveys, the variables available were restricted. Other potential mediators that could have been of interest were not available in the survey and so could not be included in the analysis. The cross-sectional nature of our data limits our ability to draw causal inferences. Second, the way our outcome variable was constructed may influence bias in the study. In this study, sexual risk behaviours were constructed from three variables (lack of condom use with non-spousal partner, extra-marital sex and history of STD) but they may not cover all sexual risk behaviours possible. The validity of this study may also be affected by the possible under-reporting of child sexual abuse. In our study, about 25 of the participants reported a history of CSA, compared to a minimum of 6 per cent in population studies conducted by the WHO (Brown *et al.*, 2009). As the data were collected through self-reporting and due to the sensitive nature of the questions being asked, there is likelihood that some respondents might not disclose their past experience. Therefore, it is likely that an exact account of the CSA will be unavailable. Although only two factors (alcohol and cigarettes) were used as meditational factors in this study, there are other potential mediators that could be used, such as drug use, assertiveness, self-efficacy, psychological symptoms (depression, post-traumatic stress disorders) and re-victimization (Malow *et al.*, 2006a; Miller, 1999) which are beyond the scope of this study.

Despite these limitations, this study makes several key contributions to the existing literature. The data from the DHS are widely considered to be of high-quality based on sound sampling methodology and adherence to ethical standards of data collection. Furthermore, DHSs are considered to have a high response rate. In this study, a more appropriate and recent SEM technique was used to examine the mediating effects of drug abuse and alcohol on the link between CSA and sexual risk behaviours.

Conclusion

The results from this study suggest that female respondents that experience CSA may subsequently develop sexual risk behaviour in adulthood and that the association is partly mediated by alcohol use and smoking.

Implications for practice

- Findings from this study have important policy implications.
- The results may be helpful for policy makers and health care planners in designing cultural sensitive public health intervention that will reduce the burden of childhood sexual abuse, its long-term effects (sexual risk behaviours) and intervening mediators that increase the risks.
- These findings can provide support to policy makers and those in public health to raise awareness about the links between childhood sexual abuse and high risk sexual behaviour later in adult life, with the hopes of finding wider solutions.

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