Contextual Determinants of Condom Use and Number of Sexual Partners among Emerging Adults in Nigeria

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Abstract

Several studies have examined the determinants of sexual behaviour of young adults in Nigeria. These studies found explanations in individual and household predictors. However, there is little research on the influence of community factors associated with condom use and number of sexual partners. This omission has affected community-based interventions that will address risky sexual behaviour. Hence, this study tested models on condom use and multiple sexual partners and incorporated individual-level alongside household and community characteristics using the 2013 Nigeria DHS. Results showed males used fewer condoms and had more multiple sexual partners than females. The results revealed that age, education, employment status, religion, female-headed household, region, place of residence, ethnic diversity, community poverty and community education influenced condom use and number of sexual partners at varying degree. Familial and community-based interventions should be encouraged with a view to sustaining transition of emerging adults into responsible adulthood.

Introduction

Low condom use and multiple sexual partnership have implications in high prevalence of sexually transmitted diseases including HIV/AIDS. These poor health outcomes have generated a serious public health concern in sub-Saharan Africa. It is well documented in the literature that majority of the young people between ages 15-24 years that engage in risky sexual behaviour live in sub-Saharan Africa, a region with the highest burden of HIV (National Agency for the Control of AIDS, 2016). Low condom use and multiple sexual partners are prevalent among the young segment of the population that countries in the African sub-region leverage on for development, emerging adults (Sawyer *et al*., 2012). Emerging adulthood has been conceptualized in the literature as a developmental age period that is associated with identity exploration and substantial change in roles and responsibility of young people transiting from adolescence to adulthood (Arnett, 2016).

The transition to adulthood remains elongated in most developed countries. It tarries so long these days that marriage and parenthood have come later as many young people continue to pursue their education and career. Age at marriage and enrolment rate for tertiary education increased steeply some decades ago (Arnett, 2015). This is because marriage has been equated to adulthood and its markers, financial independence, separation from parents and gainful employment becomes a milestone difficult to achieve for youth (Lundberg *et al*., 2016). Social transformation and liberal economic system promote individualistic tendencies and reduce the social relevance of marriage. Thus, this makes emerging adults have relative freedom to explore diverse sexual relationships (Waters *et al*., 2012; Klinenberg *et al*., 2012). It is debated in the literature that delayed transition to adulthood requires new conceptualization in the life course perspective, a period termed, emerging adulthood (Arnett, 2015).

Emerging adulthood, the period between ages 18–25, is a time of substantial change in role and responsibility when young people take independent decisions and are spurred to make sense of purpose in life including sexuality (Unemo *et al*., 2017). It is also the phase of life identified with increased risky sexual and other problem behaviour including substance use (Lee, Mun, White, & Simon, 2010; Stone, Becker, Huber, & Catalano, 2012) and sexual activity (Connor, Psutka, Cousins, Gray & Kypri, 2013; Dodge *et al*., 2010; Jozkowski & Satinsky, 2013). Thus, the increased period of schooling and career pursuits extend the window of opportunity for emerging adults to engage in risky sexual behaviour (Williams & Aderanti, 2011; Willoughbys & Carroll, 2012; Epstein, Bailey, Manhart, Hill & Hawkins, 2014).

In sub-Saharan Africa, studies have shown increasing age at first marriage (Garenne, 2014; Palamuleni, 2010) especially among educated women who pursue their career (Garenne, 2004; Mokomane, 2006; Ikamari, 2005); and men who delayed marriage because of its huge financial outlays (Dintwat, 2010). There is evidence that young people delay marriage because of critical mass of youth unemployment, endemic poverty, gender and socio-cultural norms (Akanle, Ademusan & Omotayo, 2019). Yet, evidence from developed countries established a need to address the sexual behaviour of emerging adults who have been overlooked in policy and research agenda (Arnett, 2015).

In this sense, the delayed process to adulthood creates a window of opportunity for emerging adults to explore and experiment with risky sexual behaviour and there is evidence of this in Nigeria (Agunbiade & Aransiola, 2016). The involvement of emerging adults in risky and diverse sexual relationships in the developed countries is also evident in Nigeria. Little evidence in Nigeria shows the need to focus research on emerging adults who assume adulthood lifestyles with permissive sexual behaviour (Settersten Jr & Ray, 2010; Williams & Aderanti, 2011; Willoughby & Carroll, 2012)**.** For instance, a study conducted in Nigeria among some selected undergraduate students showed evidence of high prevalence of multiple sexual partnership, cohabitation and inconsistent or non-use of condom (Agunbiade & Aransiola, 2016). In like manner, evidence from the Demographic and Health Surveys in Nigeria over the course of three decades showed increasing number of sexually active youth and increased age at marriage. However, there is low contraceptive use among these sexually active young people

Besides, researchers have argued that risky sexual behaviour occurs most commonly among emerging adults between age 15 and 24 years in sub-Saharan Africa (Berhan & Berhan, 2015). Evidence suggests that risky sexual behaviour influences negative health outcomes, such as unwanted pregnancies and sexually transmitted infections including HIV/AIDS (Goli, Rammohan & Singh, 2015; Uchidi *et al.,* 2012; Namisi *et al.,* 2013). Meanwhile, HIV and other sexually transmitted infections (STIs) remain a significant public health concern in sub-Saharan Africa and emerging adults are more vulnerable to HIV infections (United Nations Development for AIDS, 2017; Tanser *et al*., 2013). In addition, similar evidence suggests about 71% of these young people are living with HIV/AIDS and more than half of the global estimates on STIs are among young females aged 15-24 years (UNAIDS, 2014; Kharsany & Karim, 2016).

Nigeria is the most populous country in Africa and has about 63% of its population below 25 years. The state of health of this young people has serious implications for the whole country. This young population, however, bears the largest burden of negative health outcomes (NPC & ICF International, 2014; Odimegwu & Somefun, 2017; Okonkwo, 2013). Many studies in Nigeria and elsewhere (Goli, Rammohan & Singh, 2015; Djukpen, 2012; Deckman & Nathan DeWall, 2011; Mutina, Govender, Gow & Gorge, 2013; Adebayo, Ilesanmi & Alele, 2016; Odimegwu & Adedini, 2013) have linked early sexual debut, multiple sexual partnership, inconsistent or non-use of contraception to these poor health outcomes among young people. Nigeria has 63% of her population below the age of 25 years (NPC and ICF International, 2014).

Young adults aged 15-24 years represent a significant proportion (42%) of the youthful population of Nigeria (National Agency for the Control of AIDS, 2016). Emerging adults aged 18-25 years fall in-between this population. However, transition from adolescence to adulthood is fraught with a myriad of public and population health challenges in Nigeria including risky sexual behaviour (Odaga, 2012). It is well documented in the literature that half of the new HIV infections are among young people aged 15-24 years in Nigeria and are caused by unprotected heterosexual intercourse (NACA, 2016). This segment of the population represents what Nigeria would leverage on for future development (Sawyer et al., 2016).

In Nigeria, studies on sexual behaviour of emerging adults have begun to gain research attention, though still in its early stage. For example, a study in Nigeria on patterns and determinants of sexual behaviour of emerging adults in two tertiary institutions lent credence to the argument that young people between the age of 18 and 25 years seek career choices, strive to make headway in life, live and take sexual decisions independent of parents and engage in risky sexual behaviour (Agunbiade & Aransiola, 2016). While the study contributes to the knowledge base on the determinants of sexual behaviour of emerging adults, however, the study failed to expand the scope of inquiry across the diverse ethnic groups in Nigeria and did not use a nationally representative data. Results of this study are likely to be biased because of the diverse ethnic and cultural orientation. Also, more studies are needed for consistency of results in Nigeria. Meanwhile, most of the studies on sexual behaviour of young people examined the influence of individual and household socio-demographic determinant and reported mixed results in Nigeria (Abdulhareem & Fawole, 2009; Adebayo, Ilesanmi & Alele, 2016). However, evidence suggests individual and household interventions aimed at addressing negative sexual behaviour are less successful in Nigeria.

Added to this is the concern for sexual permissiveness towards non-marital sexual relationships as emerging adults adjust marriage expectations (Twenge *et al*., 2015). In this sense, emerging adults are susceptible to risky sexual behaviour because of the ample time available for premarital sexual relationship (Viner *et al.,* 2016). Thus, the wide gap between initiation of sex and marriage promotes sexual exploration. Apparently, emerging adults find it difficult to assume adulthood responsibilities because its markers, financial independence, completion of school and getting promising jobs are increasingly becoming elusive (Lundberg, Pollak & Stearms, 2016). Reviewed studies in the developed countries showed that social transformation and liberal economic system pave way for self-oriented tendencies and make marriage and parenthood socially irrelevant to emerging adults (Allison & Risman, 2017). All of these speak to why high rate of cohabitation, risky sexual behaviour, substance abuse and poor health outcomes are predominant among emerging adults (Posel, 2011; Arnett, 2016).

Meanwhile, community-based interventions are needed in mitigating the effects of risky sexual behaviour because individuals are nested within households and households nested within communities. Socio-ecological system theory emphasised that sexual behaviour and its outcomes are influenced by individual agency, household as well as community characteristics (Uthman, 2010). There is the need to look beyond individual and household characteristics in researching the sexual behaviour of emerging adults. However, there are no studies that consider the influence of individual, household and community factors on sexual behaviour of emerging adults in Nigeria. This research omission will limit interventions designed to address risky sexual behaviour and its negative implications in Nigeria. Many studies in Nigeria have applied multilevel analysis to cater for the omission of exogenous influence of community on sexual behaviour of adolescents and other health outcomes especially in data with heirachical structure (Uthman, 2010; Adedini *et al*, 2014; Solanke & Rahman, 2018).

While studies in other countries are drawing attention to the influence of contextual factors on sexual behaviour of young people (Benefo, 2008; Kayeyi, Fylkesnes, Wiium & Sandoy, 2013; Finneran & Stephenson, 2014; Sommer & Mmari, 2015; Wamoyi *et al.,* 2014), there is dearth of studies in Nigeria that examine the influence of community-level factors on sexual behaviour of emerging adults. The few studies conducted in Nigeria on contextual factors and sexual behaviour focused on adolescents (Uthman, 2010; Fatusi & Bloom, 2008). In the same vein, Nigerian studies have paid much attention to individual and household characteristics, but less to community-level factors. Yet, literature shows that knowledge on the determinants of

sexual behaviour at individual and household characteristics is not sufficient to address risky sexual behaviour (Muchiri *et al*., 2017; Timiun, 2017). This is because the communities where emerging adults are raised tend to modify their characteristics and therefore their sexual behaviour. Based on socio-ecological system theory, I hypothesize that emerging adults living in two different households with similar socio-economic characteristics can exhibit different sexual behaviour if they are from different communities because of the impact of the communities they are exposed to. Hence, this study investigated the contextual determinants of sexual behaviour of emerging adults in Nigeria.

Data and Methods

Study Design

The study employed a multilevel cross-sectional descriptive quantitative research design. The study drew data from the 2013 Nigeria Demographic and Health Survey (NDHS). Data were extracted and pooled for males and females from this survey for unmarried emerging adults aged 18-25 years who are sexually active in the last one-year prior to the survey.

Study Population

The data used in this paper were derived from the 2013 Nigeria Demographic and Health Survey among emerging adults aged 18-25 years in Nigeria. The participants of the study are unmarried emerging adults who are sexually active in the last one year preceding the survey. Having identified in the literature that sex bias limits the results of studies on sexuality of young people, data were extracted for both males and females by pooling data for generalizability of results and to have larger sample to reduce the standard error and enhance the statistical power of the study. Thus, the required total sample size was 4,270 males and 4,244 females making a total of 8,514.

Sampling Technique

The selection of sample was based on clusters and households and this involved a three-staged sampling technique. Nigeria was divided into strata and this consists of all the 36 states and the Federal Capital Territory (FCT). Enumeration Areas (EAs) were created in every state for easy access to the respondents. In the first stage, 896 clusters were randomly selected. The second stage involved a random selection of one EA from most of the clusters and this resulted to the selection of 372 EAs from the urban areas and 532 from the rural areas. A total of 45

households were selected from each rural and urban area. In all, 40,680 households were sampled for the survey: 23,940 in the rural areas and 16,740 in the urban areas. Complete details of the methods used in the 2013 NDHS have been published elsewhere (NPC & ICF International, 2014).

Data Collection

Data were collected through the use of questionnaires that were administered by conducting face-to-face interviews. Information obtained through this process covered socio-economic characteristics, child health, fertility, sexuality, reproductive history, prenatal and postnatal care, nutrition, immunization and HIV/AIDS. Information on sexual behaviour focused on age at first sexual initiation, number of sexual partners and consistency in the use of condom with sex partners. Median age at first sex in Nigeria was reported as 17.6 years.

Outcome variable

We used condom use and number of sexual partners among emerging adults aged 18-25 years. The outcome variables were measures of sexual behaviour and questions on condom used in the most recent sexual intercourse and number of sexual partners young adults had in the past 12 months. These variables were dichotomised into 1 Yes or 0 No. Multilevel Binary Logistic Regression was used to examine the influence of contextual determinants, measured at individual, household and community levels on condom use and number of sexual partnership.

Independent variables

Individual-level factors: the following variables were considered in the study namely; age, sex, education, employment status and religion. Other control variables are HIV perceived knowledge, substance use, knowledge of contraception and mass media exposure. These variables were selected based on their significance in the literature and theory.

Community-level factors

The individual variables were aggregated at the cluster level to build the community-level variables. These variables were considered: region, place of residence, ethnic diversity, community education, and community poverty level and community mass media exposure. The weighted sample size is 8,514, Males (4,270) and females (4,244).

Statistical Analysis

Data were analysed using descriptive and inferential statistics. Three levels of analysis were presented in this paper; univariate, bivariate and multivariate. Frequency distribution, Chi-square and Multilevel Binary Logistic Regression Model were used to analyse the variables

(through Stata). Descriptive analysis was used to estimate condom use and number of sexual partners and other important independent variables. The inferential statistics on the other hand were used to establish association between individual, household, community-level variables and age at first sex using Chi-square and multilevel binary logistic regression. Variance Inflation Factor (VIF) was performed to ensure the absence of multicollinearity among the explanatory variables. This was compared against the mean VIF score of 5 or more suggests multicolinearity. A mean VIF of 3.32 was obtained in this study indicating that the explanatory variables are adequate for the study. The multilevel Cox proportional hazard model was applied to account for the hierarchical nature of the data. This was used to assess the variations in age at first sex attributable to community factors using the xtmixed command in Stata for the continuous nature of the outcome variable (StataCorp, 2011).

A 2-level model was specified. The model was fitted and replicated in four different models with the exclusion of the empty model. Model 1 included only individual characteristics, while Model 2 intervening variables, Model 3 included household and Model 4 community variables. In Model 5, all the variables including the control variables were included in the model. The fixed effects of the multilevel model were assessed using the multilevel binary logistic regression and probability value while the random effects were measured using Intra-Class Correlation (ICC).

Ethical Considerations

Ethical issues have been addressed in the 2013 Nigeria Demographic and Health Survey being a secondary data. Confidentiality and anonymity were maintained through secure storage of data in the DHS.

Results

Individual-level characteristics of emerging adults

Table 1: Percentage distribution of individual-level characteristics

Characteristics	Female (n=4,244)	Male (n=4,270)
Age		
18 – 21	2869(67.60)	2,591(60.70)
22-25	1,375(32.40)	1,678(35.30)
Total	**4,244 (100.00)**	**4,270 (100.00)**
Educational Status		
No education	164 (3.86)	517 (12.10)
Primary	271 (6.38)	405 (950)
Secondary	3,027 (71.32)	2,815 (65.94)
Tertiary	783 (18.44)	532 (12.46)
Total	**4,244(100.00)**	**4,270 (100.00)**
Religion		
Christianity	3,182 (74.97)	2,122 (49.70)
Islam	1,925 (24.16)	2,101 (49.22)
Traditional & others	37 (0.87)	46 (1.08)
Total	**4,244 (100.00**)	**4,270 (**100.00)

Table 2: Percentage distribution of household-level characteristics of emerging adults

Variables	Female(n=4,244)	Male (n=4,270)
Household structure		
Homogeneous	3,122 (73.56)	3,426 (80.24)
Heterogeneous	1,122 (26.44)	844 (19.76)
Total	4,244 (100.0)	4,270 (100.00)
Household size		
Small	1,387 (32.67)	1,514(35.46)
Medium	2,213(52.14)	1,835(42.99)
Large	4,244(15.18)	921(21.55)
Total	**4,244 (100.0)**	**4,270 (100.00)**
Sex of head of household		
Male	2,831 (66.70)	3,603 (84.38)
Female	1,413 (33.30)	6,672 (15.62)
Total	**4,244 (100.0)**	**4,270 (100.00)**
Wealth status		
low	554(13.05)	1,174 (27.49)
Middle	944(22.24)	(22.11)
High	2,747(64.71)	(50.40)
Total	**4,244 (100.00)**	**4,270(100.00)**

Table 3: Percentage distribution of community-level characteristics

Variables	Female(n=4,244)	Male (n=4,270)
Place of residence		
Urban	2,624 (61.60)	2,092 (48.97)
Rural	1,620 (38.40)	2,178(51.03)
Total	4,244 (100.0)	4,270 (100.00)
Region		
North-Central	652(15.37)	682(15.97)
North-West	338(7.96)	590(13.83)
North-East	527(12.41)	1,199(28.09)
South-East	932(21.97)	467(10.95)
South-South	917(21.61)	643(15.04)
South-West	878(20.69)	688(16.12)
Total	**4,244 (100.0)**	**4,270 (100.00)**
Ethnic Diversity		
Low	4,138 (97.49)	4,197 (98.31)
High	106 (2.51)	73(1.69)
Total	**4,244 (100.0)**	**4,270 (100.00)**
Community mass media exposure		
Low	3,310(77.99)	2,672(62.60)
High	934(22.01)	1,597(37.40)
Total	**4,244 (100.00)**	**4,270(100.00)**
Community poverty level		
High	309(72.9)	995(23.31)
Medium	1,3228(31.28)	1,221(28.61)
Low	2,607(61.43)	2053(48.08)
Total	**4,244(100.00)**	**4,270(100.00)**
Community Education Level		
Low	395(9.29)	1,099(25.76)
Medium	1,311(30.90)	1,181(27.65)
High	2,538(59.81)	1,989(46.58)

Total	**4,244(100.00)**	**4,270(100.00)**

Percentage distribution of outcome variables

The outcome variables number of sexual partners and condom use. Besides, the results revealed higher use of condom among males (58.5%) compared with 47.2% for females. More than half of female did not use condom in their last sexual experience (53%) compared with (41.5%) for males. In addition, the results showed almost three-quarters of males (69%) had multiple sexual partners compared with females (42%). About two-thirds of females reported to engage in sexual relation with a partner (58%) while (31%) of males reported sex with a single partner.

Table 4: Percentage distribution of outcome variables

Characteristics	**Female (n=4,244)**	**Male (n=4,700)**
Condom use		
Use	847 (47.11)	858 (58.52)
Non-Use	949 (52.83)	608 (41.48)
Total	1796 (100.00)	1,465 (100.00)
Number of sexual partners		
Single	1,287 (57.73)	577 (31.03)
Multiple	942 (42.27)	1,281 (68.17)
Total	2,229 (100.00)	1,858 (100.00)

Multilevel analysis of individual, intervening, household, community and condom use

Fixed effects: Individual-level factors and condom use

The results presented in (Table 4) in Model 1 with the individual-level factors as the only covariate in the multilevel analysis showed female emerging adults aged 22-25 years are 3% less likely to use condom in their most recent sexual intercourse compared to those aged 18-21years (OR: 0.97, p>0.05). Educational attainment was significantly related to condom use. The results showed females with primary education are 81% less likely to use condom compared to those that are not educated. (OR = 0.19, p > 0.05), those with secondary education are 93% less likely to use condom compared to those with no education (OR = 0.07, p < 0.05), and those with tertiary education are 97% less likely to use condom compared to those not educated (OR = 0.03; p < 0.05). For males, age is not significantly related to condom use (OR = 0.76, p > 0.05). Males that have secondary education are 81% less likely to use condom compared to those who are not educated (OR = 0.019, p < 0.05), and those with tertiary education are 95% less likely to use condom compared to those not educated (OR = 0.05, p < 0.05). Employment status and religion were not significantly related to condom use for males.

Fixed Effects– Intervening factors and condom use

Concerning the intervening variables, the result revealed that those with low knowledge of contraception are 84% less likely to use condom compared to those with no knowledge (OR = 0.16, p < 0.05), those with average knowledge are 88% less likely to use condom relative to those with no knowledge (OR = 0.12, p < 0.05), and those with high knowledge of contraception are 93% less likely to use condom compared to those with no knowledge of contraceptives (OR = 0.07, p < 0.05). Mass media exposure was significantly associated with condom use. Females that are exposed to mass media are 57% less likely to use condom relative to those not exposed.

For males, knowledge of contraception was not related to condom use. Media exposed was associated with condom use. The results showed those exposed are 66% less likely to use condom relative to those not exposed (OR = 0.34, $p < 0.05$). HIV perception and substance use were not associated with condom use for both females and males.

Fixed Effects– Household-level factors and condom use

With regard to household level factors, females from large household are two times more likely to use condom relative to those from small households (OR = 1.59, $p < 0.05$). Wealth status was also significantly associated with condom use. Results revealed females from medium wealth category were 48% less likely to use condom compared to those from low wealth category (OR = 0.52, $p < 0.05$). Those from high wealth status category are 74% less likely to use condom relative to those from low wealth category (OR = 0.26, $p < 0.05$). Sex of head of households was not related to condom use for female emerging adults. For males, wealth status was related to condom use. Males from medium wealth category are 51% less likely to use condom relative to those from low wealth category (OR = 0.59, $p < 0.05$). The results revealed males from high wealth category are 78% less likely to use condom relative to those from low wealth category (OR = 0.22, $p>0.05$). Sex of head of household was not significantly related to condom use for males.

Fixed Effects– Community-level factors and condom use

Regarding community-level factors, the results showed region of residence was significantly related to condom use. Those form North-West were almost 4 times likely to use condom compared to those who from North Central (OR = 3.66, $p<0.05$). Females form South-South are almost two times more likely to use condom relative to those from North Central (OR = 1.63, $p<0.05$). Place of residence was also significantly related to condom use. Females who reside in urban areas are 64% more likely to use condom compared with those from rural areas

(OR = 1.64, p<0.05). The results were also significant with community-level poverty. Females from community with average poverty are 51% less likely to use condom relative to those from high community poverty level (OR = 0.49, p<0.05). In addition, the results revealed those from low community poverty are 68% less likely to use condom relative to those with high community poverty level (OR = 0.32, p<0.05). For males, the results showed region of residence was significantly related to condom use. Males from North West are almost 8 times more likely to use condom compared with those from North Central (OR = 7.21, p<0.05). Those from North-East are 6 times more likely compared to those from North Central (OR = 6.024; p<0.05). The results further revealed that males from South East are 3 times more likely to use condom relative to those from North Central (OR = 2.27, p<0.05). In addition, those from South-South are three times more likely (OR = 2.74, p<0.05) and similarly those from South-West are 3 times more likely relative to those from North Central (OR = 3.11, p<0.05). With regard to place of residence, the results revealed those from urban areas are 3 times more likely to use condom relative to those from North Central (OR = 2.58, p<0.05). Concerning community poverty level, the results revealed males from community with average poverty level are 60% less likely to use condom relative to those with high community poverty level (OR = 0.40, p<0.05). Those from low community poverty are 73% less likely to use condom relative to those from high community poverty level (OR = 0.27, p<0.05). Community mass media exposure was associated with condom use. The results showed that males with high exposure are 3 times more likely to use condom relative to those with low mass media exposure (OR = 2.35, p<0.05). Ethnic diversity and community education were not significantly associated with condom use for both

males and females.

Fixed Effects: Full Model– Individual, household, community-level factors and condom use

For the full model, the results showed education was significantly related to condom use. Those who have secondary education are 78% less likely to use condom compared to those who are not educated (OR = 0.12, p<0.05). In addition, females who have tertiary education are 94% less likely to use condom compared with those not educated (OR = 0.06, p<0.05). Females from rich households are 46% less likely to use condom compared with those from low wealth status category (OR = 0.54, p<0.05). Sex of head of household was significantly related to condom use. Females who have female-headed households are almost two times likely to use condom compared to those with male-headed households (OR = 1.30, p<0.05). Region of residence was associated with condom use. Females from North West are three times more likely to use condom relative to those from North Central (OR = 3.66, p<0.05). Also, those from South-South are 50% more likely to use condom relative to those from North Central (OR = 1.50, p<0.05). For males, the results revealed those with secondary education are 64% less likely to use condom relative to those with not educated (OR = 0.36, P<0.05).

Also, emerging adults who have tertiary education are 88% less likely to use condom compared to those not educated (OR = 0.12, p<0.05). With respect to wealth status, those with average wealth status are more likely to use condom relative to those with low wealth status category (OR = 1.01, p<0.05) and those from rich wealth status category are 47% less likely to use condom relative to those with low wealth status category (OR = 0.53, p<0.05). Region of residence was significantly related to condom use. The results showed males from North West were 6 times more likely to use condom relative to those from North Central (OR = 5.92,

p<0.05). In addition, the results revealed those from North East are 5 times more likely to use condom relative to those from North Central (OR = 5.31, p<0.05), South East are almost three times more likely to use condom relative to those from North Central (OR = 2.41, p<0.05). In addition, the results showed that those from South-South are 3 times more likely to use condom relative to those from North Central (OR = 2.97, p<0.05) and those form South-West are almost 4 times likely to use condom relative to those from North Central (OR = 3.71, p<0.05). Furthermore, the results showed that place of residence was significantly related to condom use. Urban residents are two times more likely to use condom relative to those form rural areas (OR = 1.78, p<0.05).

The Random Effects

The results of the empty Model in the multilevel analysis (Model 0 that has no independent variables) showed a significant variation with respect to female emerging adults in Table 5. The results showed that the intra-class correlations (ICCs) of 19% and 13% across community and individual levels, respectively. With the inclusion of individual-level factors in the analysis, Model 1, the results showed significant variation across community and individual levels with ICC values put at 14% and 9% respectively. The proportional change in variance attributed with the inclusion of individual-level factors in the multilevel analysis showed significant variation, 31% and 30% at community and individual levels, respectively in Model 1. Furthermore, the inclusion of intervening variables (Model 2, Table 5.2) also revealed significant variation across community and individual levels, respectively. The values of ICC across community and individual levels respectively were 16% and 13%. This is the variation attributed with the inclusion of intervening variables. In addition, Model 3 was included into the multilevel analysis by considering household-level factors. The results showed a significant variation across community and individual levels with ICC values put at 12% and 13% respectively. This is the

variation that occurred with the inclusion of household-level factors. The PCV also showed values of 39% and 6% across community and individual levels, respectively (Model 3, Table 4).

Additionally, the measures of variation with the inclusion of community-level variables showed significant variation across community. The variation in the use of condom attributed to the community-level factors showed ICC of 12% and 12% across community and individual-levels, respectively. The PCV showed significant variation 40% and 6% across community and individual levels, respectively. The inclusion of the full Model (Model 5) showed a significant variation across community and individual levels, respectively. The values of the ICC were 9% and 9% across community and individual levels, respectively. The PCV showed significant variation attributed to condom use, 55% and 42% across community and individual levels, respectively.

With regard to male emerging adults, the results showed a significant variation in the odds of condom use in Model 0 without the inclusion of explanation factors. The values of the ICC were 32% and 33% across community and individual levels respectively. With the inclusion of individual-level factors (Model 1, Table 4), the odds of using condom showed significant variation with the values of ICC, 26% and 33% across community and individual levels, respectively. When intervening variables (Model 2) were included into the multilevel analysis, the values of the ICC vary across community and individual levels, 31% and 36% respectively. The PCV showed a significant variation in the odds of condom use attributed to intervening variables – 5% and 18% across community and individual levels, respectively.

Furthermore, the results showed significant variation with the inclusion of household-level factors (Model 3) into the multilevel analysis. The values of ICC were put at 26% and 32% across community and individual level respectively in Table 4 Also, the inclusion of community-level variables (Model 4) showed a significant variation with the values of ICC put at 22% and

32% respectively. This is the variation across community and individual levels attributable with the inclusion of community-level factors. On the whole, the inclusion of the full Model (Model 5, that combined individual, household and community level factors) into the multilevel analysis showed significant variation with ICC values put at 17% and 30% across community and individual levels, respectively. The PCV also showed the variation attributed to the inclusion of the full Model, 54% and 14% across community and individual levels respectively.

Multi-Level analysis of individual, intervening, household, community and number of sexual partners

Fixed Effects: Individual-level characteristics and Number of Sexual Partners

Model 1 in Table 5 shows the effect of individual-level characteristics – including age, educational status, religion, and employment status disaggregated by sex. These variables were included in the Models to examine whether the odds of having multiple sexual partners vary across all the variables. The results showed that age was significantly associated with number of sexual partners (OR = 3.11, $p<0.05$) and (OR = 2.62, $p<0.05$) for both female and male emerging adults respectively. Females aged 22-25years are almost three times likely to have multiple sexual partners compared with those aged 18-21 years. In like manner, the results revealed those aged 22-25 years and 3 times more likely to have multiple sexual partners compared with those aged 18-21years for males.

Furthermore, educational status was related to number of sexual partners for both females and males. The results revealed that females with tertiary education are 64% less likely to have multiple sexual partners compared with those who are not educated. On the other hand, males that had primary, secondary and tertiary education had significantly higher odds of having multiple sexual partners compared to those who are not educated (OR = 2.27, $p<0.05$), (OR = 1.86, $p<0.05$) and (OR = 2.59, $p<0.05$) relative to those who are not educated. Additionally,

employment status was significantly associated with number of sexual partners for males but not females. The results revealed that unemployed males are 28% less likely to have multiple sexual partners compared with the employed (OR = 0.72, $p<0.05$). Religion was not associated with number of sexual partners for both females and males.

Intervening variables - Fixed Effects

Incorporating this into the multilevel analysis, knowledge of contraception was not associated with number of sexual partners for both females and males. For males, the results revealed that those exposed to mass media are 3 times likely to have multiple sexual partners relative to those not exposed (OR = 2.25, $p<0.05$). HIV perception was not associated with number of sexual partners for both sexes. However, males who used substance are 3times more likely to have multiple sexual partners relative to those who did not use substance (OR = 2.64, $p<0.05$).

Household-level factors – Fixed Effects

The results revealed that females from medium household size are 25% less likely to have multiple sexual partners compared with those from small household size (OR = 0.75, $p<0.05$). For males, the results showed those from medium and large household size are 31% and 49% less likely to have multiple sexual partners relative to those from small household size (OR = 0.69, $p<0.05$), and (OR = 0.51, $p<0.05$) respectively. The results showed male emerging adults from average wealth index households are 36% more likely to have multiple sexual partners relative to those from low wealth index households (OR = 1.36, $p<0.05$).

Community-level factors– Fixed Effects

The selected community-level covariates were considered in the multilevel analysis in model 4. After incorporating community-level factors into the multilevel models, the results revealed that (Table 6) the risks of having multiple sexual partners remained significantly higher in North West (OR = 2.46, $p<0.05$), South East (2.75, $p<0.05$) and South-West (OR = 1.56, $p<0.05$) relative to those from North Central for females. For males, the results revealed that the odds of having multiple sexual partners was significantly lower in North West (OR = 0.61, $p<0.05$), North East (OR = 0.46; $p < 0.05$) but higher in South West (OR = 1.42, $p<0.05$) relative to those from North Central. Females from rural areas are almost 3 per cent more likely to have multiple sexual partners compared with those from urban areas (OR=1.03, $p<0.05$). On the other hand, males from rural areas are 5% more likely to have multiple sexual partners compared with those from urban areas (OR=1.05, $p<0.05$).

The results showed community ethnic diversity was significantly associated with number of sexual partners for females. The results revealed that those whose ethnicity is heterogeneous are almost three times likely to have multiple sexual partners relative to those from homogenous ethnicity (OR = 2.72, $p<0.05$). For males, those from community with low and average community poverty are almost 2 times likely to have multiple sexual partners compared with those from community with high poverty level (OR=1.59; OR=1.32, $p<0.05$). Community education was significantly related to number of sexual partners. Males from community with high proportion of educated emerging adults are 33% less likely to have multiple sexual partners compared with those from community with low proportion of educated emerging adults (OR=0.67, $p<0.05$). Also, males from community with average proportion of educated emerging

adults are 16% less likely to have multiple sexual partners compared with those from community with low proportion of educated emerging adults (OR=0.84, P<0.05).

On the other hand, community education was significantly related to number of sexual partners for females. Females from community with high proportion of educated emerging adults are 26% less likely to have multiple sexual partners compared with those from community with low proportion of educated emerging adults (OR=0.74, p<0.05). Also, females from community with average proportion of educated emerging adults are 27% less likely to have multiple sexual partners compared with those from community with low proportion of educated emerging adults (OR=0.73, P<0.05).

Fixed Effects: Full Model– Individual, household, community-level and number of sexual partners

Furthermore, incorporating all the variables – individual, household and community into one model, the results showed risk of having multiple sexual partners was higher among females aged 22-25years (OR = 3.13, p<0.05), males (OR = 2.54, p<0.05) respectively. For education, the results revealed lower odds of having multiple sexual partners for tertiary education (OR = 0.36, p<0.05). However, the results showed significantly higher odds of having multiple sexual partners for primary education (OR = 2.17, p<0.05), secondary education (OR = 1.85, p<0.05) and tertiary education (OR = 2.87, p<0.05). Males who are unemployed are 28% less likely to have multiple sexual partners relative to those employed (OR = 0.72, p<0.05). Incorporating household-level factors, the results revealed males from average household size and those from high household size are 19% and 35% less likely to have multiple sexual partners compared with those from small household size (OR = 0.81, p<0.05) and (OR = 0.65, p<0.05) respectively. Adding community-level variables into the model, the results revealed that the risk of having

multiple sexual partner significantly increased across regions with North West (OR = 3.09, $p<0.05$), North East (OR = 7.23, $p<0.05$), South South (OR = 2.84, $p<0.05$), and South-West (OR = 1.71, $p<0.05$) compared with those from North Central. For males, the risk of having multiple sexual partners remained significantly lower across region with North West (OR = 0.62, $p<0.05$), North East (OR = 0.48, $p<0.05$) and South West (OR = 1.59, $p<0.05$) relative to those from North – Central. The results also showed that the odds of having multiple sexual partners was higher among female emerging adults from heterogeneous ethnic group (OR = 3.35, $p<0.05$) compared with those from homogenous ethnic group.

The Random Effects:

The results of the null model from the multilevel analysis (model 0, which contained no explanatory variable) showed a significant variation in number of sexual partners (Table 5.3) at individual and community levels. The results revealed that the intra-class correlations (ICCs) of 21% and 24% were associated with number of sexual partners at community and individual levels, respectively. Comparing measures of variation in model 0 and Model 1 (Table 5.3), the results showed that inclusion of individual-level characteristics in the multilevel model yielded significant variation across individual and community levels. For instance, the proportional change in variance (PCV) in Model 1 Table 5.3 indicated 24% and 48% of the variance in the odds of having multiple sexual partners across individual and community levels, respectively. These variations were explained by the inclusion of individual-level characteristics into the multilevel analysis.

Furthermore, incorporating intervening variables into the multilevel analysis, Model 2, the measures of variation remained significant across community, with ICC associated with risk of having multiple sexual partners estimated at 20% and 24% across individual and community levels, respectively. In addition, household-level characteristics showed significant variation with

ICC put at 20% and 22% across community and individual levels, respectively. As indicated by the PCV in Model 2 in Table 5.3, 6% and 2% of variation across individual and community levels respectively could be explained by characteristics at the intervening level. Similarly, the PCV in Model 3 with the inclusion of household-level variables showed that 3% and 6% of variation across individual and community levels respectively could be explained by characteristics at household-level. Variance associated with the inclusion of community-level factors in the multilevel modeling was significant across community (Model 4, Table 5.3). The values of ICC of 15% and 25% across community and individual levels, respectively, were associated with the odds of having multiple sexual partners.

The results showed PCVs of 34% and 5% across community and individual levels, respectively in the odds of having multiple sexual partners that could be explained by community-level characteristics (Model 4, Table 5.3). Regarding the full Model, Model 5, that contains all the selected variables at individual, household and community level factors. The intervening variables were excluded because of multicolinearity. The values of ICC were put at 18% and 31% across community and individual levels, respectively were associated with the odds of having multiple sexual partners. The results showed PCVs of 15% and 46% across community and individual levels, respectively in the odds of having multiple sexual partners that could be explained by the combined full model (Model 5, Table 5.3).

For males, the results of the null Model from the multilevel analysis (Model 0, which conained no explanation variable) showed a significant variation in number of sexual partners (Table 5.3) at individual and community levels. The results revealed that the intra-class correlations (ICCs) of 9% and 8% were associated with number of sexual partners at community and individual levels, respectively. Comparing the measures of variation in Model 0 and Model 1 (Table 5.3), the results showed that inclusion of individual-level characteristics in the multilevel model yielded significant variation across community and individual levels. For example, as

shown by the proportional change in variance (PCV) in Model 1 (Table 5.3), 24% and 48% changes in the odds of having multiple sexual partners across community and individual level characteristics.

Furthermore, incorporating intervening variables into the multilevel analysis, Model 2, the measures of variation remained significant across communities, with ICC associated with odds of having multiple sexual partners estimated at 10% and 29% across community and individual-levels respectively for intervening variables across community and individual-levels respectively. For household-level characteristics in Model 3, the results indicated a significant variation across the community and individual level characteristics with ICC put at 8% and 26%. With the inclusion of community-level variable, the result showed 7% and 15% variance across community and individual level, respectively that could be explained by community-level factors. Considering the full Model, with the exclusion of intervening variables, the values of ICC was put at 9% and 15% across community and individual levels respectively were associated with the odds of having multiple sexual partner.

Discussions

This study examined relationship between contextual determinants and condom use and number of sexual partners in Nigeria. Some salient results were in the study. The results of this study showed that condom use was higher among males and number of sexual partners. Males used condom more and had fewer number of sexual partners than the females. This stance is in consonance with the position in the literature that males are inclined to overestimate their sexual activity in a context where masculinity tendencies are common and sexual power dynamics are in favour of male (Sprecher, 2014; Pica *et al.,* 2012).

Previous research has reported high rate of multiple sexual partnership, early age at first sex and low condom use among young people and these differ by sex (Steffenson, Pettifor, Seage Rees & Cleary, 2011). Consistent with other studies (Stack *et al*., 2011, Zembe *et al*., 2012; Namisi *et al*., 2013), condom use was higher among males than females. Narratives from the interviews and discussions confirmed that more males engaged in multiple sexual partnership, used condom and had sex earlier than females. Evidence from this study showed that risky sexual behaviour is on the high side among emerging adults especially the ones in higher institutions. Females perceived their engagement in unsafe sexual practices to lack of loyalty of males in sexual relationships. Males also accused females of transactional sex and claimed financial and material gains are the reasons why females engage in multiple sexual partnership. Different patterns of sexual behaviour were revealed in this study including gang rape, drug-induced sex, pornography and sexting and oral sex. These findings are consistent with previous studies (Bersamin *et al*., 2014).

Furthermore, the results support the hypothesis that individual – level factors – age education, religion, employment status influenced age at first sex, multiple sexual partnership condom use and this varied by sex. For example, this study revealed that age of respondents was related to age at first sexual debut, condom use and multiple sex partnership. The plausible reason for this is because older emerging adults are likely to be independent and be exposed to sexual activity than the younger emerging adults. This position is in line with previous literature (Onoya *et al*., 2014; Exavery *et al*., 2012a).

Education was significantly related to age at first sex. The plausible reason is that educated young ones are less likely to engage in first sex. This result is in agreement with previous studies that argued that schooling extends the period of engagement of emerging adults in sexual activities (Clark & Mathur, 2012). The plausible explanation for this is that educated people are knowledgeable of the negative implications of risky sexual behaviour and thus delay the period of having first sex.

Also, this study found that employment status was associated with age at first sex and this result varied by sex. The possible reason for this is that employed emerging adults have access to sexual and reproductive health information and this perhaps reduces their involvement in early sexual activities. In addition, Islamic religion was associated with age at first sex for females. The plausible reason for this is that Islamic religion allows early marriage and parents give out their daughters in marriage at young age. Evidence from this study provided support to social action theory that argues that individual behave in a particular way based on the actions and expectations of people in that particular context (Somefun, 2019; Magadi & Uchudi, 2015). The study found that emerging adults from medium and high household wealth are less likely to have early sex compared to those from poor household wealth index. This result lends credence to the argument that emerging adults from socio-economic disadvantaged households are prone to risky sexual behaviour (Uchudi,

Magadi & Mostizer, 2012). Emerging adults from poor households especially females may be exposed to early sexual debut so as to survive by engaging in transactional sex. The rich may also be ambitious and determined to succeed in life. Thus, they may not engage in risky sexual behaviour that will jeopardize their ambition.

Furthermore, household size was significantly related to age at first sex in this study. Previous studies have established that large households are poorer and belong to the lower socio-economic class. Thus, emerging adults from large household may struggle with resources especially the females who may engage in transactional sex (Evans *et al*., 2016; Ngidi *et al.*, 2016). The result of this study found that females exposed to mass media are more likely to initiate sex and have multiple sexual partners. The result is similar to the study that found no relationship between mass media exposure and sexual behaviour (Odimegwu, Somefun & Chisumpa, 2018). Yet, this may be because mass media exposure may pollute the mind and mislead females to risky sexual activities. This stance is in contrast to the findings of prior studies that argued that exposure to mass media encourages positive sexual behaviour (Muche *et al*., 2017).

Also, this study found that males that used substance are more likely to engage in early sex. This result is plausible because substance use and risky sexual activities have been established to be inextricably intertwined in the literature (Whiteford, 2013; O'Hara & Cooper, 2015). Male emerging adults who take substance or drug have been found to sexually harass females (Horwood, 2013). The study further revealed that knowledge of contraception increases the chance of condom use. This is in line with previous studies that have found high knowledge of contraception as a driver of resilience against risky sexual behaviour (NPC and ICF International, 2014; Simons *et al*., 2018; Whiteford *et al*., 2013).

Additionally, age was a significant predictor of condom use. Older emerging adults used condom in their last sexual intercourse compared to the younger ones. One possible reason for this is that the older emerging adults (22-25) years explore sexual activities because they are close to adults and some of them at this period must have had sexual intercourse (Macphail & Campbell, 2001). This result provided additional support to the emerging adulthood theory that claims young people in their early twenties and close to thirties is spurred to explore and experiment with sexual activity as they transit to adulthood (Amett, 2015). Education was also significantly related to condom use in this study. This result is in tandem with prior studies that established that educated youth are more knowledgeable about protective sex and have access to sexual and reproductive health information that promotes condom use (Agunbiade & Aransiola, 2016; Marteleto *et al*., 2008).

Religion was significantly related to early sexual debut and multiple sexual partnership in this study for females. This is because Islamic religion supports early sexual relationship and marriage for females. However, religion may not be adequate enough to explain sexual behaviour of emerging adults in line with previous studies (Somefun, 2019; Olivier & Wondon, 2015). Religiosity markers such as religious attendance, commitment to religious activities and importance attached to religious activities predict sexual behavIn line with previous studies (Hadash *et al*., 2017; Tsala *et al*., 2011), household size was found to influence the number of sexual partners. Emerging adults from large and moderate households are more likely to have multiple sexual partners. This result speaks volume on how emerging adults from small household size are better off and exhibit positive sexual behaviour. In addition, wealth status was found to influence sexual behaviour. Emerging adults from rich households are less likely to have multiple sexual partnership in this study.

This result is in contrast with studies that argued that emerging adults from rich household engaged more in risky sexual behaviour (Odimegwu, Somefun & Chisumpa, 2018).

It was found in this study that sex of head of household influenced sexual behaviour of emerging adults. For example, studies have shown two-parent families positively influence the sexual behaviour of young adults (Epins *et al*., 2016; Tsala *et al*., 2011). Female emerging adults with female household head are more likely to engage in risky sexual behaviour as noted by previous studies (Odimegwu, Somefun & Chisumpa, 2018; Muchiri *et al*., 2017). This may be because female head of households are not strict with their children especially the male children. The absence of a father-figure in the households could make emerging adults compromise pro-social sexual behaviour.

Community-level characteristics were associated with sexual behaviour of emerging adults in Nigeria. Region of residence was found as a predictor of sexual behaviour of emerging adults in Nigeria in line with previous studies (Odimegwu & Somefun, 2017) Emerging adults in the Northern regions are more likely to engage in risky sexual behaviour as do emerging adults in the Southern parts of the country. These findings support the central idea of the theory of socio-ecological system theory that environmental factors influence sexual behaviour (Jones *et al*., 2017).

Place of residence was also found to influence sexual behaviour of emerging adults. For instance, this study found that emerging adults who live in the rural areas are less likely to have first sex and more likely to use condom compared to those from the urban areas. The plausible explanation for this is that rural dwellers are not exposed to environment where liberal sexual orientation is commonplace. This stance is against previous studies that established that emerging adults in the urban areas exhibit positive sexual behaviour because of availability of youth-friendly centres for sexual and reproductive health services and

information and high awareness about the danger of HIV and access to condom (Odimegwu, Somefun & Chisumpa, 2018). Yet, this study found that emerging adults from urban areas had single sexual partners more than those from rural areas. This result lends credence to socio-ecological system theory that posits that environmental factors influence sexual health outcomes (Agba *et al.,* 2017; Oster, 2012). Residents of rural areas may not have access to information on sexual and reproductive health. Emerging adults in the urban areas have access to SRH services, HIV Campaign and this may enhance positive sexual behaviour.

Furthermore, the relationship between community poverty level and sexual behaviour supports the hypothesis that emerging adults from economically disadvantaged areas are more likely to exhibit negative sexual health outcomes (Sicard *et al*., 2016; Lippman *et al*., 2018, Kayeyi, Fylkesnes, Wiium & Sanday, 2012). This result is in consonance with the main thrust of socio-ecological system theory. The evidence shows that areas with high proportion of economically disadvantaged (physical and quality of life indicators) emerging adults are more vulnerable to negative sexual health outcomes. This is consistent with the findings that explain socio-economic disadvantage is a predictor of multiple sexual partners (Pascoe *et al*., 2015; Amare *et al*., 2019; Sicard *et al*., 2016). This study found community mass media exposure as an influential factor of sexual behaviour of emerging adults. This corroborates the findings of previous studies that emphasised exposure to mass media reduces risky sexual behaviour (Adebayo, Ilesanmi & Alele, 2016; Muche *et al*., 2017). This is because high proportion of mass media exposure in a community enriches knowledge and practice of protective sexual behaviour. However, other studies have established that community mass media exposure does not influence sexual behaviour of emerging adults (Agunbiade & Aransiola, 2016).

At the community level, ethnic diversity influenced sexual behaviour of emerging adults in this study. This is in agreement with previous studies (Carlson, 2013; Rojas *et al*., 2016) that argued that heterogeneous ethnic group produces emerging adults with tendencies for risky sexual behaviour (Mberu, 2011). The plausible explanation for this is that a heterogeneous ethnic group tends to have different cultures and values about positive sexual behaviour. In such context, prosocial sexual behaviour may be difficult to promote among young people. In addition, community education in this study showed a significant relationship with number of sexual partners. The results showed that emerging adults with middle and high level education are less likely to have multiple sexual partners compared to the uneducated ones. This is supported by prior studies (Keyeyi, Fylkesnes, Wium & Sandoy, 2012; Muchiri *et al*., 2017). By this, high proportion of educated emerging adults in a community engaged in positive sexual behaviour

Conclusion

This study revealed that contextual factors were associated with condom use and number of sexual partners. One of the limitations of this study is that it was a cross-sectional survey. So, causality relationship may not be a true reflection of the results. Changes in condom use and number of sexual partners may not be totally associated with the independent variables. However, the multilevel approach is a rigorous statistics that presents better estimates than the normal survival analysis. Data from self-reported sexual behaviour may be biased as females may like to report socially desirable responses and may exaggerate their sexual behaviour to show masculinity tendencies such as claiming to have initiated sex earlier when it is not.

Policy Implications

The results of this study suggest that programmes and interventions on sexual behaviour of emerging adults should focus on individual, household and community-based interventions. Interventions should be sex-specific across the geo-political zones. Existing programmes should be reviewed to examine how emerging adults could exhibit positive sexual behaviour. The message has to be communicated beyond individual level characteristics to involve community-level factors.

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