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Research article

Multilevel analysis of psychosocial functioning of Adolescents in families affected by HIV/AIDS in Benue state, Nigeria

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ABSTRACT

Psychosocial functioning is increasing a public health priority issue among young people. Previous reports have focused on the effect of personal health conditions on the psychosocial well-being of children but contextual analysis of environmental or social factors could provide relevant information for interventions. In the context of HIV/AIDS, the present study examined the personal- and contextual-level predictors of Psychosocial Functioning Index (PFI) among adolescents in Benue state, Nigeria. Data on 2,276 adolescents was extracted from a cross-sectional study in Benue State for secondary analysis. The PFI was obtained using the final score of an existing scale (Adolescents Psychosocial Functioning Inventory). Participant's characteristics were summarized using descriptive statistics and compared using Chi-square test. Multilevel logit models were used to assess the individual- and contextual-level predictors of the PFI of adolescents. A nominal p-value ≤0.05 was considered significant in all analyses. Participants were 14.77±2.04 years old and mostly female (53.9%). About 19% of the participants have single parents while 62.1% have self-employed mothers. Proportion with elevated PFI was significantly higher among adolescents who have self-employed mothers (84.4%) and alcohol/substance users (82.7%). In adjusted analysis, adolescents who reported alcohol/substance use (OR=1.65; 95%CI: 1.14 to 2.38) were twice more likely to have elevated psychosocial functioning index compared to non-users. The psychosocial functioning index is high among study participants and differs contextually. Adolescent's psychosocial functioning depends on their life styles and parents' marital and economic situations. Family empowerments and other family level intervention programmes will benefit adolescents in these categories.

Keywords: *Psychosocial functioning, Adolescents, Psychosocial problems, Families affected by HIV/AIDS, Multilevel analysis, HV/AIDS*

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INTRODUCTION

Psychosocial factors (Psychological and the surrounding social environmental factors of individuals) have great impacts, not only on their physical and mental wellness but also on their ability to function in day to day activities (Dean, Oxford, Staines et al., 2017; Woodward, 2015; Singh-Manoux, 2003). Psychosocial problems have been recognized as an increasing public health challenge globally. Although the burden of psychosocial problems cut-across all age categories, it is more prevalent and consequential among children and adolescents than any other age group. In 2009, Buckley (2009) found that the learning ability of over 33% of elementary school students was impaired by psychosocial problems which interfered with their ability to attend to and engage fully in instructional activities.

In many situations, assessing psychosocial functioning is complicated by some contextual factors of the individuals being assessed. Such background factors may include disease conditions (Northam, Lin, Finch et al., 2010), difficult life experience (Nsereko, Musisi, Nakigudde et al., 2014; Horn, 2010; Okawa, Yasuoka, Ishikawa, et al., 2011) and other community or family level characteristics whose consequences on the psychosocial variables may significantly affect their impacts on the adolescents' functioning. In developed countries such as the United States of America (USA), a family-based treatment (FBT) study involving family members of adolescents suffering from Anorexia nervosa (AN) reported poorer psychosocial adjustment among siblings of adolescents with AN compared to their peers, both before and after FBT (Abubakar, Alonso-Arbiol, Van de Vijver et al., 2013). In another report, psychosocial problems were implicated in serious mental illnesses and suicide attempts among 10% of college students in the USA (van

Langenberg, Sawyer, Grange et al., 2016]. In china, Adolescents bearing multiple psychosocial problems were reported to experience additive risks of using substances (ACHA, 2006) while in a developing setting such as India, children of parents with posttraumatic stress disorder (PTSD) expressed a significant behavioural disorders, symptoms of intrusion, avoidance as well as significantly higher level of a host of other psychosocial problems compared to children of parents without PTSD [Wu, Wu, Wang, et al., 2015). In Africa, psychosocial functioning of adolescents has been assessed in different context including HIV/AIDS and family systems (Selimbasic, Sinanovic, Avdibegovic, 2012; Govender, Reardon, Quinlan et al., 2014; Atwine, Cantor-Braae, Bajunirwe, 2005; Operario, Pettifor, Cluver et al., 2007; Segendo & Nambi, 1997; Cluver, Gardner, Operario, 2009; Cluver & Gardner, 2006; Nyamukapa, Gregson, Lopman et al., 2008). For instance, a number of factors have been associated with diminished psychosocial wellbeing amongst 'AIDS orphans' compared to other children (Govender et al., 2014; Atwine et al., 2005]. In particular, when controlling for orphan status and related demographic variables, psychosocial outcomes of adolescents in South Africa were more strongly impacted by household composition/size, economic situations, caregiver health and the caregiver-child relationship (Akpa & Bamgboye, 2015).

Studies conducted in Nigeria have reported that parenting styles (Govender et al., 2014) and HIV/AIDS (Nyamukapa et al., 2008) have significant impact on the emotional well-being and quality of life of adolescents. In sub-Saharan Africa, existing studies on association between HIV/AIDS and psychosocial functioning [(Selimbasic et al., 2012; Govender et al., 2014; Atwine et al., 2005; Operario et al., 2007; Segendo & Nambi, 1997; Cluver et al., 2009; Cluver & Gardner, 2006] have not exclusively focused on the population of adolescents in the region. Also, while the available reports have focused on the effect of personal health conditions on the psychosocial well-being of children, recent evidences (Northam et al., 2010, Nyamukapa et al., 2008; Akpa & Bamgboye, 2015; Adegoke, 2008) suggested that certain environmental or social factors could play important role. Thus, there is a need for better understanding of the determinants of elevated psychosocial problems among adolescents in this setting. In this study, we examined the personal- and contextual-level predictors of elevated psychosocial dysfunctions among adolescents in Nigeria. We additionally examine whether there is significant contextual variation in psychosocial functioning of adolescents by quantifying the clustering effect attributable to their relationship with a family member infected by (or dead from) HIV/AIDS

MATERIALS AND METHODS

Ethical consideration: The present study was based on an analysis of anonymised existing survey data with all identifier information removed. The original survey was approved by two ethics committees: The University of Ibadan Institutional Review Board with the ethics approval number UI/EC/12/0235 and the Benue state Ministry of Health's ethical committee with the reference number MED/261/VOL.1/56. Permission was further obtained from the authorities of the various schools while the school principals or designated officers of the institutions stood as guardians for the students. All study participants gave verbal informed consent before participation and information were collected confidentially. Participation was voluntary and individuals were free to withdraw from the study at any time without any consequence.

Study design: The present study is a secondary analysis of data extracted from a large cross-sectional study (among children and youths in Benue state, Nigeria) funded by the Medical Education Partnership in Nigeria (MEPIN), an initiative of Fogarty international, National Institute of Health (NIH), United State of America.

Sampling technique: The sampling strategies of the original study have been published elsewhere [Akpa & Bamgboye, 2015; Akpa, Bamgboye & Baiyewu, 2015]. Briefly, the survey used a multistage sampling technique. For the purpose of the study, Benue state was stratified into 3 broad political districts regarded as Senatorial districts in Nigeria. Each Senatorial district is made up of at least 7 Local Government Areas (LGAs) (i.e Local political administrative area). In addition to the state capital, the first stage involved purposive selection of the headquarter town of the LGA with the highest HIV prevalence in each senatorial districts, making four political administrative areas in all. The second stage involved the selection of the largest public and private Secondary schools (with students from diverse ethnic, family and socioeconomic background) in the selected town. In a selected school, consenting students from randomly selected classes were given the self-administered questionnaires to complete in English language. Where no private school with the desired characteristics was available, only the largest public school was selected and children and youths attending youth friendly centres (who have not been captured in the survey in any school) were interviewed. For the purpose of the present analysis, participants' cluster was established based on the family member (father or mother or brother or sister or uncle) infected by or dead from HIV/AIDS.

Study instruments

Participants' personal and family characteristics: The study questionnaire consisted of sections including the demographics (information on participants' age, sex, ethnicity, birth-order and alcohol use) and family background (information on parents' level of education, occupation of parents, parents' marriage situation mother's number of children and family member infected or dead from HIV/AIDS.

The Adolescent Psychosocial Inventory (APFI): The APFI is a multidimensional psychosocial measure consisting of three subscales: Optimism and Coping Strategies (OCS), Behaviour and Relationship Problems (BRP) and the General Psychosocial Dysfunction (GPD) (Akpa, Bamgboye & Baiyewu, 2015). Domain scores were computed as the sum of the scores of the individual items in the respective domains while the overall Psychosocial Functioning Index (PFI) score was computed as the average of the domain scores after

reversing scores for all items on the OCS domain. Higher domain or overall scores indicated elevated psychosocial functioning problems, except for the OCS where lower scores indicate poorer optimism and coping. In the present analyses, domain and overall scores above the 75th percentiles of domain-specific scores were categorized as "Optimistic" for the OCS and "Elevated" for the other domains and the PFI. The APFI was shown to have an overall reliability estimate of 0.83, and as high as 0.90 for the GPD subscale in an initial validation study (Akpa, Bamgboye & Baiyewu, 2015).

Data extraction, management and scoring of variables: Data were extracted for a total of 2,553 of the participants who were adolescents (aged 10-19 years) in the state wide MEPIN sponsored study. Some participants were further excluded from the current analysis for one or a combination of the following reasons: participant did not provide any response on whether any of their family members was positive for HIV or dead from AIDS; participant endorsed the same response for all items on the APFI or participant did not provide any response for all items of the APFI scale. This reduced the total sample used for the present analysis to 2,276 participants. Data were extracted and scored for the variables as described below:

Outcome variables: Though the Adolescents' Psychosocial Functioning Inventory (APFI) has three dimensions, the outcome variable of interest in the present analyses was the overall (or total) Psychosocial Functioning Index (PFI) (Akpa, Bamgboye & Baiyewu, 2015). For the sake of the present analysis, the PFI was dichotomised as "elevated" and "not elevated" using the 75th percentiles of the score as the cut-off.

Individual-level predictors

Sex was defined as male and female.

Age was categorized into three groups: Early adolescence (10-12 year), Mid-adolescence (13-17 years) and late adolescence (18-19 years).

Ethnicity: participants' ethic affiliation was recoded into three groups: Tiv, Idoma/Igede and others (including the Igala, Hausa/Fulani, Yoruba etc.).

Birth-order: participants' birth-order or position in the siblings was categorized as first born, second born, third born and forth or higher.

Alcohol/substance use was defined as users and non-users.

Family-level predictors

Parents' marital situations: this was categorized as single parent, parents live apart or parents live together.

Mother's occupation: the primary occupation or employments of participants' mothers were grouped into self-employed, employees of private organisations, employees of government organisations and others (including retirees, clergy, house helps etc).

Parity: the total number of children given birth to by participants' mothers was grouped into less or equal to 4 children and greater than four children.

Statistical analyses: Participant's characteristics including demographics, alcohol/substance use and family backgrounds were summarized using descriptive statistics. Summary statistics were point estimates (including percentages, Mean and standard deviation), compared between categories of participants' characteristics using Chi-square test.

As a result of the clustering nature of the data, a 2-level Multilevel Logit Regression Model (MLRM), was used to investigate whether the contextual characteristics (including parents marital situations, mother's occupation, and parity) and the individual-level variables (including sex, age, ethnicity, birth order and alcohol/substance use) contributed or have influence on the psychosocial functioning index among study participants. The general form for the MLRM model is given as:

$$\ln\left(\frac{p_{ij}}{1-p_{ij}}\right) = \beta_0 + \sum_{ij}\beta X_{ij} + u_{0j} \qquad 1$$

where p_{ij} is the probability that the ith adolescent in the jth HIV affected family has elevated psychosocial problems or not; ($\beta_0 + \sum_{ij}\beta X_{ij}$) consist of the fixed part estimating coefficients for the predictor variables, X_{ij} ; u_{0j} is the random quantities attributable to the contextual characteristics such that $u_{0j} \sim N(0, \Phi_u{}^2)$ (Uthman & Kongnyuy, 2008; Yusuf, Omigbodun, Adedokun et al., 2011; Merlo, Chaix, Ohlsson et al., 2006; de Leeuw & Meijer, 2008; Hedeker, 2008). In addition, in assessing the proportion of the total variance in the psychosocial functioning attributable to the clusters, the Intra-class Correlation Coefficient (ICC) was computed as follows:

$$\rho = \frac{\Phi_u{}^2}{(\Phi_u{}^2 + \Phi_e{}^2)} \qquad 2$$

where $\Phi_u{}^2$ and $\Phi_e{}^2$ are the family-level and the individual-level variances respectively (Merlo et al., 2006; de Leeuw & Meijer, 2008). However, in this study, $\Phi_u{}^2$ and $\Phi_e{}^2$ are not comparable because, the former is on the logistic scale while the later is on the probability scale. Consequently, the individual-level variance was converted to the logistic scale using the linear threshold model method described in previous studies (Yusuf et al., 2011; Merlo et al., 2006; de Leeuw & Meijer, 2008; Hedeker, 2008). Therefore, in assessing the amount of variations in psychosocial functioning index that was attributed to the family-level in the present analyses, the Intra-class (intra-family) correlation coefficient (ICC) was calculated as a function of the individual- and family-level variances:

$$\rho_c = \frac{\Phi_u{}^2}{(\Phi_u{}^2 + \pi^2/3)} \qquad 3$$

where π^2 =3.142 and $\Phi_u{}^2$ is as defined earlier. A value of $\rho_c \geq 5\%$ was considered substantial and suggestive of the need for conducting a Multilevel analysis on the sample (Hayes, 2006).

The modeling processes were approached in three steps using the GENLINMIXED procedures in the IBM SPSS Statistics version 22. The first step (Model 1) examined a null model or empty model with no explanatory variables but the random intercept only to allow for detection of a possible contextual dimensions to psychosocial functioning among adolescents. The second step (Model 2) consisted of inclusion of the individual-level variables in the model to investigate the extent to which family-level differences in psychosocial functioning among adolescents is explained by individual-level variables. The final step (Model 3), was an adjusted model consisting of both the individual-level and the family-level covariates. Results of the models were presented as odds ratio (OR) with their respective 95% confidence intervals (95%CI). Model fits were assessed using the Corrected Akaike Information criteria (CAIC) and the Bayesian Information Criteria (BIC), with a lower value on the CAIC and the BIC indicating better model fit (Akpa & Unuabonah, 2011). A nominal p value of 0.05 or less was considered as statistically significant in all analyses.

RESULTS

Participants' personal/family characteristics: Participants were averagely 14.77±2.04 years old and mostly female (53.9%). Birth-order for most participants was 4th or above (43.6%) whiles more than half (54.3%) of the participants have mother who have 4 or more children (Table 1). About 19% of the participants live with single parents while 62.1% of them have mothers who are self-employed. Majority of the adolescents (79.8%) had elevated psychosocial functioning index (Table 1). Across parents' marital situations, proportion with elevated psychosocial functioning index was consistently lower among participants in early adolescence and higher among participants in mid-adolescence, except for participants with single parent (Figure1). Psychosocial functioning index was expectedly elevated among adolescents who reported alcohol/substance use (82.7%) compared to none users. Proportion with elevated psychosocial functioning index was significantly higher among adolescents with higher birth-order (3rd and above) (82.1%), parent living apart (90.4%) and self-employed mothers (84.4%) (Table 1).

Scale reliability and inter-correlation of domains: Average domain scores ranged from 2.26±2.01 (for the BRP) to 6.93±6.03 (for the GPD). Domain and overall scores correlated well with each other. As expected, adolescents with high scores on the overall psychosocial functioning index (PFI) had significantly lower scores on the OCS domain of the APFI (r=-0.30, p<0.001). On the other hand, adolescents with high scores on the PFI also had significantly high scores on the BRP (r=0.648, p<0.001) and GPD (r=0.868, p<0.001) domains of the APFI (Table 2). Overall Cronbach's alpha for the APFI scale is 0.89 in the present analysis.

Multilevel analysis: The results of the random effect model (Null model 1) for the psychosocial functioning index of the adolescents is shown in Table 3.

Table 1:
Participants' personal and contextual characteristics by HIV/AIDS Situations in the family

Characteristics	Number of adolescents	Proportion with elevated psychosocial functioning index	
		Proportion	**p**
Overall sample	**2276**	**79.8**	
Age, Mean±SD	**14.77±2.04**		
Early adolescents (10-12 years)	361(15.9)	82.3	0.158
Mid-adolescents (13-17 years)	1701(74.7)	78.9	
Late adolescents (18-19 years)	214(214)	83.2	
Total	**2276**		
Sex			
Female	1224(53.9)	78.4	0.067
Male	1048(46.1)	81.5	
Total	**2276**		
Ethnicity			
Tiv	1318(58.6)	84.1	<0.001
Idoma/Igede	589(36.2)	75.9	
Others	342(15.2)	69.9	
Total	**2249**		
Birth-order			
1st born	486(22.1)	77.8	0.036
2nd born	397(18.1)	75.8	
3rd born	357(16.3)	82.1	
4th born and above	955(43.5)	81.8	
Total	**2195**		
Alcohol and drug use status			
Non-user	1114(49.1)	77.0	0.001
User	1153(50.9)	82.7	
Total	**2267**		
Parents' marital situation			
Parents are together	1613(72.8)	78.2	<0.001
Parents live apart	178(8.0)	90.4	
Single parent	425(19.2)	81.9	
Total	**2216**		
Mother's occupation			
Self employed	1371(62.1)	84.4	<0.001
Employee of Government organisation	478(21.7)	73.4	
Employee of private organisation	148(6.7)	70.3	
Others	210(9.5)	71.4	
Total	**2207**		
Mothers' number of children			
≤4	345(15.7)	75.1	0.020
>4	1848(94.3)	80.6	
Total	**2193**		

 # - P value is for difference in proportions across categories of the predictor

Table 2: Descriptive, reliability and inter-correlation of the Domains of the APFI

Characteristics	Scale and subscale total score					
	OCS	**BRP**	**GPD**	**PFI**	**Mean±SD**	**α**
Optimism and Coping Strategies (OCS)	1				5.68±2.01	0.69
Behaviour and Relationship Problems (BRP)	0.03	1			2.26±1.61	0.58
General Psychosocial Dysfunction (GPD)	-0.30**	0.47**	1		6.93±6.03	0.90
Psychosocial Functioning Index	-0.31**	0.63**	0.97**	1	10.25±7.32	0.89

*α – Cronbach's alpha; **P<0.01*

Table 3:
Compositional and contextual factors associated with Psychosocial functioning index of adolescents in Benue state, Nigeria

	Null Model (Model I)	Model with individual level variables (Model II)	Model with individual and family level variables (Model III)
Individual characteristics	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
Age			
Early adolescents (10-12 years)		1.32(0.65-2.65)	1.34(0.60-3.00)
Mid-adolescents (13-17 years)		1.19(0.87-1.63)	1.21(0.83-1.77)
Late adolescents (18-19 years)		-	-
Sex			
Female		1.09(0.84-1.41)	1.07(0.84-1.37)
Male		-	-
Ethnicity			
Tiv		2.35(1.24-4.45)***	2.17(1.07-4.40)*
Idoma/Igede		1.19(0.71-1.97)	1.06(0.61-1.86)
Others		-	-
Birth-order			
1st born		1.12(0.90-2.22)	1.42(1.04-1.97)*
2nd born		0.76(0.60-0.97)*	0.74(0.59-0.93)**
3rd born		1.17(0.76-1.81)	1.16(0.79-1.70)
4th born and above		-	-
Alcohol and drug use status			
User		1.64(1.17-2.30)**	1.65(1.14-2.38)**
Non-user		-	-
Family covariates			
Parents' marital situation			
Parents live apart			1.04(0.74-1.45)
Single parent			2.25(1.69-2.99)***
Parents are together			-
Mother's occupation			
Self employed			1.73(1.36-2.21)***
Employee of private organisation			1.14(0.73-1.79)
Employee of Government organisation			0.97(0.79-1.19)
Others			-
Mothers' number of children			
>4			1.20(0.86-1.67)
≤4			-
Intercept	**6.17(3.03-12.56)*** **	**2.071(0.86-4.98)**	**1.24(0.69-2.22)**
Random effect			
Contextual random variance (SE)	1.061(0.69)	0.899(0.61)	0.651(0.52)
ICC (%)	24.4	21.5	16.5
Proportion of variance explained (%)	Reference	15.3	38.6
Model fit statistics			
AICc	7,500.33	7,169.26	6,884.95
BIC	7,505.66	7,174.53	6,890.16

*OR- Odds Ratio, ICC- Intra-class correlation coefficient, AICc- Akaike Information Criterion, BIC- Bayesian Information Criterion, SE- Standard error; *P<0.05, **P<0.01, ***P<0.001*

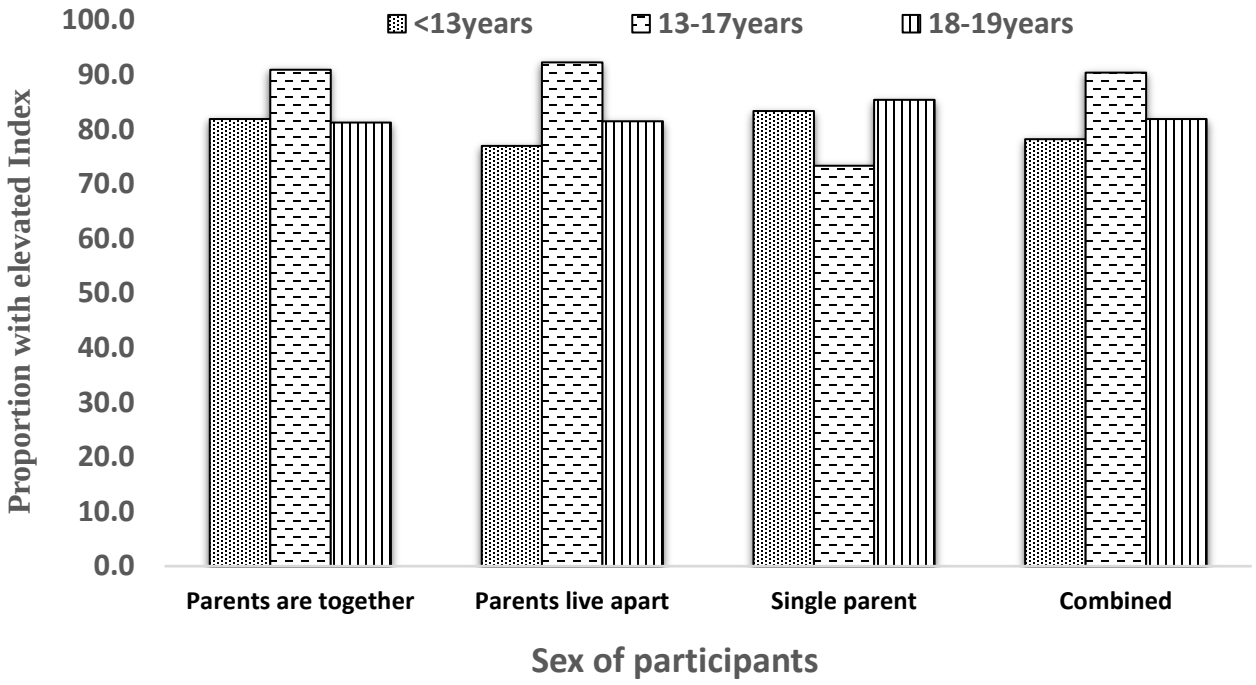

Figure 1:
Adolescents psychosocial functioning index per age group across parents' marital situations

There is no significant variation in the log odds of psychosocial functioning index of the adolescents across family situations ($\Phi^2_\mu = 1.06, p = 0.123$) but the estimate of 24.4% variance (in the odds of psychosocial functioning index of the adolescents) that could be attributed to family-level is considered substantial (Hayes, 2006).

The variation remained substantial even after adjusting for individual-level predictors (Model 2) and both individual and family-level characteristics (Model 3) (Table 3). A part from that, more than one-third (38.6%) of the proportional change in variance in the log odds of psychosocial functioning of adolescents across families were explained by individual both individual compositional and contextual factors (Model 3).

The model fit criteria; the AICc and the BIC revealed that the inclusion of the individual-level factors (Model 2) and the individual and contextual variables (Model 3) increased the ability of the model to explain variation in the log odds of psychosocial functioning (Table 3). Table 3 further shows the results of fitting the multilevel model with only the individual-level factors (Model 2) and the effect of the individual- and family level factors (Model 3). In model 2, adolescents with 2nd birth-order (OR=0.76; 95%CI: 0.60 to 0.98) were less likely to experience elevated psychosocial problems compared to adolescents with 4th birth-order while in model 3, adolescents with 2nd birth-order (OR=0.74; 95%CI: 0.59 to 0.93) were less likely to experience elevated psychosocial problems compared to adolescents with 4th birth-order. In both Model 2 (OR=1.64; 95%CI: 1.17 to 2.30) and Model 3 (OR=1.65; 95%CI: 1.14 to 2.38), adolescents who reported alcohol/substance use were twice more likely to have elevated psychosocial functioning index compared to non-users. As shown in model 3, adolescents with single parent were twice more likely (OR=2.25; 95%CI: 1.69 to 2.38) to have elevated psychosocial functioning index compared to children whose parents are living together (Table 3).

DISCUSSION

Normal psychosocial functioning in adolescence is critical to emotional stability and quality of life in later life. It also has great implications for the public health situations in any country or human setting. The present report on the situations of adolescents in Nigeria is important, not only for our understanding of the family dimension in adolescents psychosocial functioning but could also inform intervention in critical areas of needs. The present study examined the association between individual and family characteristics and psychosocial functioning of adolescents in Nigeria using multilevel modelling framework. Literature search yielded no study had previously considered multilevel analysis in assessing family dimension in psychosocial functioning of adolescents in Nigeria.

Overall, our results show a worrisome proportion of adolescents with elevated psychosocial index in this setting. Psychosocial functioning index is associated with personal demographic characteristics, life styles and family background of adolescents. Across all categories of the personal and background characteristics considered, the

proportion with elevated psychosocial functioning index was above 60%. While we do not have any immediate explanation for this high prevalence, it is not unlikely that the high psychosocial distress was occasioned by the high poverty rate, general poor standard of living in the country, and possibly the burden of HIV/AIDS on the families of the study participants. Unfortunately, there are no local studies with which to immediately compare our findings. Notwithstanding, selected studies in some part of sub-Saharan Africa (Northam et al., 2010; Nsereko et al., 2014; Horn, 2010; Okawa et al., 2011; DeSilva, Skalicky, Beard et al., 2012; Nsereko, Musisi, Nakigudde et al., 2014; Escueta, Whetten, Ostermann et al., 2014) have reported high prevalence psychosocial functioning problems among children and young people. In particular, in a study conducted among undergraduate university students selected from three universities in a similar setting such as Uganda, 37% of the participants were reported to have psychosocial problems and this was due to traumatic life experiences in about 49%; emotional problems in about 35%; antisocial behaviour in about 21% and academic problems in about 38% of the participants (Nsereko, Musisi, Nakigudde et al., 2014). Also, in a similar study conducted among adolescents selected from rural and urban India, the overall prevalence of psychosocial problems was found to be 40.5% and was higher among boys (46.5%) than girls (34.5%) (Jain, Singh, Muzammil et al., 2014). These findings demonstrate that high prevalence of psychosocial problems is characteristics of adolescents in developing countries, especially those exposed to difficult life situations.

The special interest in the present study remained the possible effects of personal characteristics and family context in the odds of reporting elevated psychosocial functioning index among adolescents in Nigeria. Using multilevel frame work, the individual- and family-level characteristics included in the model were able to explain at least two-third (66.5%) of the observed variations in adolescents' psychosocial functioning index. This study further revealed that alcohol/substance use increased log odds of experiencing elevated psychosocial functioning problems among adolescents by sixty five percent. Apart from increasing the risk of psychosocial problems, the proportion of adolescents reporting alcohol and substance use (50.9%) in the current study is of great concerns. Actually, alcohol/substance use, especially in underage is a very important risk factor for a range of physical, academic, and social problems globally. It has been reported that substance use may set adolescents on a pathway of long-term psychological distress, in addition to evidence of negative consequences of frequent use (Green, Zebrak, Robertson et al., 2012).

Notwithstanding, our finding is closely related to previous reports in other parts of the world and despites its negative consequences in underage users, alcohol use continues to be widespread among adolescents globally (Adger & Saha, 2013). In the United States of America (USA), data from an annual survey (Monitoring the Future) of youth, show that 71% of high school seniors reported some experiences with alcohol in the past while 41% reported use in the last one month and, 3% reported daily use of alcohol (Adger & Saha, 2013).

The problem of adolescent substance use and the elevated psychosocial problems in the current population may not be unrelated to family or parenting situations. A previous study among students randomly selected from five local government areas of Ibadan in Nigeria, had reported a significant effects of parenting styles on psychosocial well-being of adolescents (Adegoke, 2008). This corroborate with our finding that adolescents having single parent are twice more likely to have elevated psychosocial functioning index compared to those with parents living together. Based on our local understanding, children of single parents (especially single mothers) in the study location are faced with a number of cultural and social problems. Some are denied access to farm land, and right to inheritance while others are being stigmatized, depending on the reason(s) for lack of second parent. Such difficult life experiences have been reported to play important role in the psychosocial wellbeing of young people in related settings (Northam et al., 2010). Though the current data limits our ability to explore any hypothesis in that direction, many previous studies have reported family dimension in psychosocial wellbeing and health of children and adolescents in sub-Saharan Africa (Horn, 2010; Okawa et al., 2011; Case & Ardington, 2006). Adolescents, in the absence of both or either of the parents are prone to a series of developmental disadvantages resulting in poor education, such as lags in grade for age and school attendance relative to other children (Case & Ardington, 2006; Evans & Miguel, 2007; Ainsworth, Beegle & Koda, 2005). In fact, such children are more vulnerable to a number of other anti-social lifestyles, heightened risk of increased emotional difficulties and other psychosocial problems.

Some necessary caveats need be considered in the interpretation and application of the present results. Associated with every cross-sectional study is the inability to draw causal inference, a longitudinal study would have provided data for causal effect of the relevant factors. As a result of the available data, the predictors of psychosocial functioning used in the present analysis were limited to a few demographics, lifestyle and family background factors. As such, we were unable to conduct an exhaustive selection of other factors to be examined in this study, so that uncontrolled confounding for such factors may have affected our results (Okekunle, Akpa, & Akinyele, 2015). The APFI has not been used outside Nigeria, notwithstanding, the high Cronbach's alpha for the overall score suggested the appropriateness of the measure in this context and settings. Also, a crucial strength of the present study is its novelty; the first in Nigeria to considered family factors as contextual predictors of adolescent psychosocial functioning index using the frame work of multilevel statistical model.

In conclusion, the variation in the psychosocial functioning index of adolescents that is attributable to the contextual factor (i.e the family member infected or killed by HIV/AIDS) is substantial. In general, selected individual- and family- level factors are independently associated with the psychosocial functioning of adolescents in the study area. In particular, adolescents with single parent or involved in alcohol/substance use are more prone to psychosocial problems compared to those having parents living together or non-alcohol/substance users. In the context of HIV/AIDS,

children of self-employed mothers have elevated psychosocial problems than other employment status. Family empowerment and other family level intervention programmes will benefit adolescents in these categories.

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