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Afr. J. Biomed. Res. Vol. 23 (Special Edition, July, 2020); 47- 52

Research Article

Adverse Childhood Experiences and Psychosocial Wellbeing among Preclinical Medical Students of The University of Ibadan

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ABSTRACT

Adverse childhood experience (ACE) portends future consequences on physical, mental and social wellbeing. The impact of ACEs is amplified by stressors, such as academic, physical, social and emotional stressors, which medical students are constantly exposed to. This study is aimed at determining the association between adverse childhood experiences and adult psychosocial wellbeing among preclinical medical students. A cross sectional study was conducted among medical students in the 2nd and 3rd year of study, at the University of Ibadan, Nigeria. Participants completed socio-demographic, an Adverse Childhood Experience, the World Health Organization's Quality of Life (WHOQOL-BREF) and the Rosenberg's self-esteem questionnaires. Data obtained were analyzed using SPSS. Descriptive and inferential statistical analyses were performed. A total of 277 respondents with a mean age of 20.1 years (SD=5.6) participated in the study. At least one out of ten categories of ACEs were reported by 40.8% of respondents; physical abuse (19.1%), emotional abuse (18.2%), parental divorce (9.4%) and sexual abuse (9.0%). There was a significant association between adverse childhood experiences and adult psychosocial wellbeing ($p<0.05$), as well as low self-esteem ($p<0.05$). Respondents with previous exposure to ACEs were six times more likely to suffer from low esteem compared to non-exposed students (Adj OR:6.3, 95%CI:1.3-31.4, $p=0.003$). Mother's ($p=0.001$) and father's ($p=0.028$) level of education, parental separation ($p<0.0001$), and having lived with step-parent ($p=0.009$) or other relatives ($p=0.041$) were associated with exposure to ACEs. This study shows an association between exposure to adverse childhood experiences and adult psychosocial wellbeing among medical students.

Keywords: *adverse childhood experience; medical students; psychosocial wellbeing; stressors*

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Received: September, 2019; Accepted: March, 2020; Published: July 2020

Abstracted by:

Bioline International, African Journals online (AJOL), Index Copernicus, African Index Medicus (WHO), Excerpta medica (EMBASE), CAB Abstracts, SCOPUS, Global Health Abstracts, Asian Science Index, Index Veterinarius

INTRODUCTION

The impact of childhood experiences on adult psychosocial wellbeing as defined by mental wellbeing, life satisfaction, interpersonal relationships and educational achievement is well documented in the literature (Oladeji, Makanjuola and Gureje, 2010; Bellis *et al.*, 2013, 2014). Every child is influenced and eventually grows up to become a product of familial, environmental and societal influences, which may be positive or adverse.

The concept of adverse childhood experiences is encompassing and includes sexual, physical and emotional abuse; household dysfunction such as mother being treated violently, household substance abuse, household mental illness, parental separation or divorce and incarcerated household member (Felitti *et al.*, 1998; Oladeji, Makanjuola and Gureje, 2010; Reavis, 2013; Bellis *et al.*, 2014; Van Niel *et al.*, 2014); physical and emotional neglect (Oladeji, Makanjuola and Gureje, 2010; Reavis, 2013; Van Niel *et al.*, 2014); death of a parent; economic adversity, chronic medical illness (Oladeji, Makanjuola and Gureje, 2010) and bullying at school (Bellis *et al.*, 2013).

Global prevalence of adverse childhood experiences (ACEs) ranges from 40% - 100% of study populations (Felitti *et al.*, 1998; Oladeji, Makanjuola and Gureje, 2010; Bellis *et al.*, 2013; Salawu and Owoaje, 2014), with those affected being twice at risk for smoking (Salawu and Owoaje, 2014; Van Niel *et al.*, 2014) and 12 times at risk for both anxiety disorder (Oladeji, Makanjuola and Gureje, 2010) and suicide attempt (Van Niel *et al.*, 2014) compared to their unexposed counterpart.

Stressors have been reported to serve as mediators between ACEs and poor adult well-being; Concurrently ACEs increase the number of stressors thus accentuating these effects (Mc Elroy and Hevey, 2014). Medical students are reputedly exposed to a high degree of stress, with about three-

quarters reporting perceived stress including academic, emotional, physical and social stress (Supe, 1998; Yussuf *et al.,* 2013). Psychosocial morbidity pre-admission is a major predictor of stress in university students. Specifically, in a local study conducted among medical student at Ilorin, Nigeria, participants who had psychosocial morbidity were nine times more likely to be at risk of academic stress with attendant coping mechanisms such as spirituality and self-blame (Yussuf *et al.,* 2013). Vice-versa, stress is reported to be a major predictor of psychiatric morbidity, including anxiety and depression among medical students (Saravanan and Wilks, 2014).

Notwithstanding, the literature has limited information on the relationship between exposure to ACEs and psychosocial wellbeing. Furthermore, academic functioning among undergraduate medical students is yet to be explored in Nigeria. The present study therefore aims to determine the association between ACE and psychosocial wellbeing as well as academic performance among preclinical medical students of the University of Ibadan.

MATERIALS AND METHODS

Study design, sample and setting: A cross sectional study design was conducted among the preclinical (second year [200L] and third year [300L]) medical students of the University of Ibadan. Total sampling of all consenting second- and third-year students was done.

Study procedure and instruments: Respondents were approached after a class session and asked to complete self-reported study instruments (questionnaires) consisting of socio-demographic characteristics and the following validated instruments:

- World Health Organization (WHO)'s Quality of Life scale (WHOQOL-BREF) - a 26 item questionnaire that measures quality of life in four domains: social, physical, psychological and environmental. It has been previously used in Nigeria (Issa and Bayewu, 2006; Adewuya *et al.,* 2008; Gureje *et al.,* 2008; Akinyemi *et al.,* 2012) and has good internal reliability, Cronbach's alpha=0.86 (Gureje *et al.,* 2008)
- Rosenberg's self-esteem questionnaire - It is a 10-item instrument that asks the respondents about their self-esteem and to reflect on their current feelings. The Rosenberg's self-esteem questionnaire has been previously used in Nigeria (Olley, 2008; Adewuya *et al.,* 2009; Salami, 2010; Oshodi *et al.,* 2014) with an excellent reliability, Cronbach's alpha=0.87 (Salami, 2010).
- Adverse Childhood Experience (ACE) questionnaire - This is a 10-item questionnaire designed by the Centre for Disease Control and prevention (CDC) of the United States of America. It retrospectively asks questions on abuse (physical, psychological and sexual), neglect and household dysfunction experienced during childhood. It has been previously used in the Nigerian environment (Salawu and Owoaje, 2014) and in a similar setting (Ramiro, Madrid and Brown, 2010). A good reliability and valid internal consistency (Cronbach's alpha= 0.81) was reported in a previous study (Bruskas and Tessin, 2013).

Ethical considerations: Ethical approval was granted by the Ethics Review Board of the University of Ibadan and the University College Hospital (UI/UCH) Ibadan, Nigeria with the approval number UI/UCH/EC 15/0262. Written informed consent was obtained from all participants, after the study had been introduced and explained to them. Participation was voluntary and participant's confidentiality was assured as no identifying markers were required. Participants were assured of the liberty to withdraw from the study at any point in time without consequences.

Data entry and analysis: Data generated were entered and analyzed using the Statistical Package IBM SPSS statistics version 23. Frequencies and proportions were reported as summary statistics for all categorical variables, while mean and standard deviation was computed for all continuous variables. The prevalence of adverse childhood experience was determined using answers to items on the ACE questionnaire and summarized using frequencies and proportions. Adult psychosocial wellbeing was determined using the converted scoring system on a scale of 100, of the WHOQOL-BREV analysis guideline. Self-esteem was evaluated using the Rosenberg's self-esteem scoring system. Quantitative scores for exposure to ACE were categorized as exposed vs. non-exposed while self-esteem was categorized as low, normal and high. Associations between categorical data were assessed using Chi-square test while difference in quantitative data were assessed using independent t-test. All analyses were performed at 0.05 level of significance. Furthermore, variables found to be significant at the bivariate analysis were further investigated using logistic regression model. Odds ratio (OR), adjusted odds ratio (AOR) and 95% confidence intervals (CI) were reported.

RESULTS

A total of 277 respondents participated in the study with a mean age of 20.1 years (SD=5.6) with ages ranging from 18 to 37 years. The study population had slightly more males than females, with most of them in 200L (64.7%). Most of the respondents were from a monogamous family (88.0%), and the majority of the respondents had a 1st class GPA in their first year of study (65.7%) with 26.4% and 5.9% having GPA in the 2nd class upper and 2nd class lower respectively. Other details of the sociodemographic characteristics are on Table 1. The overall prevalence of adverse childhood experiences (ACEs) was 40.8% with the commonest being physical assault (19.1%) followed by verbal assault (18.2%) and parental divorce (9.4%). The prevalence of other ACEs is presented in figure 1.

The transformed score in the psychological domain i.e. on the WHOQOL-BREF scale for respondents who had been exposed to ACEs (14.74 ± 2.5) was lower than the score for those that had not been exposed to ACEs (15.51 ± 2.0), p = 0.009. In the social domain, the transformed score for participants who had been exposed to ACEs was 14.52 ± 2.8 compared to 15.30 ± 2.6 for the unexposed counterparts (p = 0.021).

Table 1:
Correlates of socio-demographic parameters with exposure to ACEs.

		No ACE exposure n (%)	ACE Exposed (at least 1) n (%)	Total n (%)	Statistics Chi^2	P-value
Class level	200	107 (58.2)	77 (41,8)	184		
	300	54 (61.4)	34 (38.6)	88	0.254	0.614
Age	<20yrs	91 (65.5)	48 (34.5)	139		
	20-25yrs	61 (60.0)	48 (40.0)	109	2.831	0.243
	>25yrs	5 (50.0)	5 (50.0)	10		
Sex	Male	90 (57.3)	67 (42.7)	157		
	Female	70 (61.4)	44 (38.6)	114	0.454	0.500
Religion	Islam	32 (69.6)	14 (30.4)	46		
	Christianity	115 (58.1)	83 (41.9)	198	3.444	0.179
	Traditional/others					
Tribe	Yoruba	123 (60.9)	79 (39.1)	202		
	Igbo	27 (58.7)	19 (41.3)	46	2.019	0.364
	Others	11 (45.8)	13 (54.2)	24		
Family type	Monogamous	144 (60.5)	94 (39.5)	238		
	Polygamous	17 (51.5)	16 (48.5)	33	0.971	0.324
Marital status	Single	59 (59.3)	109 (40.7)	268		
	Married	1 (33.3)	2 (66.7)	3	0.829	0.570
Father's level of education	No formal education	2 (20.0)	8 (80.0)	10		
	Primary	7 (70.0)	3 (30.0)	10	9.083	0.028*
	Secondary	12 (46.2)	14 (53.8)	26		
	Tertiary	137 (61.4)	86 (38.6)	223		
Mother's level of education	No formal education	1 (10.0)	9 (90.0)	10		
	Primary	3 (27.3)	8 (72.7)	11	16.022	0.001*
	Secondary	24 (58.5)	17 (41.5)	41		
	Tertiary	129 (63.2)	75 (36.8)	204		
Parental separation	No	158 (63.2)	92 (36.8)	250	21.709	P<0.001*
	Yes	2 (10.0)	18 (90.0)	20		
Lived with step parent	No	159 (61.2)	101 (38.8)	260	8.081	0.009*
	Yes	2 (18.2)	9 (81.8)	11		
Lived with other people	No	102 (64.6)	56 (35.4)	158	4.163	0.041*
	Yes	59 (52.2)	54 (47.8)	113		

*statistically significant

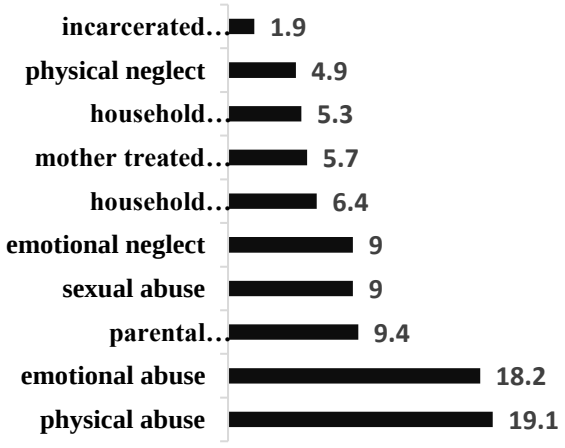

Figure 1:
Prevalence of ACEs (in percentage): Experienced at least one = 40.8%

Similar relationships were recorded between the transformed scores for the physical and environment domains and exposure vs non-exposure to ACEs (Table 2).

The association between exposure to ACEs and self-esteem is shown in figure 2. Participants who had been exposed to ACEs were six times more likely to have lower self-esteem compared to their unexposed counterparts even after adjusting for socio-demographic variables (AOR:6.3, 95%CI:1.3-31.4, p=0.003) [Table 3].

More than 80% of participants whose parents are separated (and/or lived with stepparents) had experienced ACE, same for those whose parent(s) have low level of education. Less than 40% of participants whose parents have tertiary education had experienced ACE, p<0.05, Table 1.

The current academic performance of the participants is shown in figure 3, with about 70% of the participants having CGPA in the first class division. The proportion of those who had experienced ACE was the same (40%) in the first class and second class lower division.

Table 2:
Association between exposure to ACEs and adult psychosocial wellbeing.

Outcome (psychosocial well-being) QOL domains	No experience Mean[SD]	Experienced at least 1 Mean[SD]	t-test	Mean difference [95% CI]	p-value
Physical	14.87 [2.1]	14.24 [2.6]	2.13	0.64 [0.0-1.2]	0.034
Psychological	15.51 [2.0]	14.75 [2.5]	2.65	0.76 [0.2-1.3]	0.009
Social	15.30 [2.6]	14.52 [2.8]	2.33	0.78 [0.1-1.4]	0.021
Environment	13.7 [2.1]	13.1 [2.1]	2.45	0.67 [0.1-1.2]	0.015

Table 3:
Logistic regression analysis for the association between ACEs and self-esteem.

	Low self esteem	
ACEs	**Unadjusted OR(95% CI)**	**Adjusted OR(95% CI)^**
No experience	Ref	Ref
Experienced at least 1	7.00(1.5-33.0)*	6.32(1.3-31.4)*

^adjusted for father's & mother's level of education, parental separation, lived with step parent/other people.
**significant*

DISCUSSION

This study investigated the association between ACEs and psychosocial wellbeing in adulthood. Previous studies have reported the link between ACEs and poor mental health in adulthood including other problems such as poor physical health, violence, impaired neurocognition and poor academic performance (Felitti *et al.*, 1998; Oladeji, Makanjuola and Gureje, 2010; Perkins and Graham-Bermann, 2012; Bellis *et al.*, 2013, 2014; Bruskas and Tessin, 2013; Reavis, 2013; Mc Elroy and Hevey, 2014; Van Niel *et al.*, 2014). Our results confirmed this trend among medical students with a remarkably high prevalence (40.8%) of ACE. This is consistent with previous studies, which reported prevalence rates of 50% in the United States of America (Felitti *et al.*, 1998) and from Nigeria (Oladeji, Makanjuola and Gureje, 2010). The slightly lower rate from our study may be a reflection of the difference in study population, as ours was a study among medical students, while the studies were from heterogenous national surveys. However, our finding is lower than that reported in a Nigerian study among students in a low-income urban community, which reported a prevalence of 100% (Ige, Ilesanmi and Adebayo, 2012). This may be highlighting the relatively higher prevalence of ACEs in socio-economically disadvantaged communities as earlier reported by a previous study from the USA (Schilling, Aseltine and Gore, 2007).

The top 5 types of ACE exposure in this study sample indicate that nearly 1 in 5 of the sampled medical students had experienced physical or emotional neglect; while almost 1 in 10 had suffered from emotional neglect, sexual abuse or parental separation. These figures are a cause for concern.
Similar to results of an earlier study conducted in South-Western Nigeria (Salawu and Owoaje, 2014), physical abuse was the commonest ACE in the current study. This is probably explained by the fact that certain practices such as corporal punishment remains socio-culturally acceptable in our society, in addition to the pervasively poor parental attitude towards physical abuse, that is seen as parental discipline (Nuhu and Nuhu, 2010). The prevalence of parental separation, divorce or demise is also a source of concern, but it is much lower than results obtained in the Kaiser Permanente ACE study (CDC, 2016) which found very high rates. This may be partly due to the high rates of divorce in the USA, with divorce rates nearing half (50%) of all marriage rates within a particular time period (CDC, 2015).

Certain socio-demographic variables were found to be predictors of exposure to ACEs. A high proportion of participants with low parental level of education had at least one ACE. This is due to the fact that level of education greatly correlates with behavior and attitudes towards child upbringing; and parents with lower level of education have been reported to have poorer attitudes (Nuhu and Nuhu, 2010). Other predictors of ACE include parental separation (or divorce) and having lived with step-parents and/or other people. Parental separation, which is by itself, an ACE; is also a predictor of exposure to other ACE either alone or in combination with its sequelae such as living with step parents and other relatives. Perhaps this is attributable to the fact that children are often neglected and maltreated in the absence of their parents, either resulting from parental separation, divorce or from the demise of one parent.

Our results showed an association between ACE(s) and poor psychosocial well-being among the medical students. Respondents who have been exposed to ACE had lower scores for well-being on the WHOQOL-BREV scale as compared to their unexposed counterparts. This finding was consistent across all the four domains of the WHOQOL-BREV: physical, psychological, environmental and social well-being. This poor sense of social well-being can be explained by several negative coping mechanism that these individuals may have developed over the years, leading to poor interpersonal relationships, low self-worth and low trust in others (Mullen *et al.*, 1996; Bellis *et al.*, 2013; Reavis, 2013). Furthermore, ongoing stressors, such as academic demands and time constraints in medical school adds an additional layer of complexity that puts such vulnerable medical students at a social disadvantage.

Exposure to ACE was associated with lower self-esteem compared to the non-exposed respondents. Indeed, this study found that medical students who had been exposed to ACE were 6 times more likely to suffer from low self-esteem (adjusted OR=6.32; CI of 1.3-31.4, p=0.003), than their unexposed peers. This is consistent with a previous report indicating that household dysfunction and experience of abuse is related to low self-esteem; while family bonding plays a protective role (AlShawi and Lafta, 2014). Although the individual components of ACE were not tested for an association with low self-esteem in this study, Mullen et al,.(Mullen *et al.*, 1996), reported that emotional abuse is specifically associated with low self-esteem. It is therefore,

not surprising that early experience of physical abuse, lack of care and protection, feeling of not being loved, and shame due to either mental illness in the household, or a household member in prison may all contribute to a feeling of low self-esteem.

There was no significant association between exposure to ACE and current academic performance, in contrast to earlier findings on the link between ACEs and poor neurocognition (Perkins and Graham-Bermann, 2012). This might be due to the fact that this study was conducted amongst medical students who are admitted after satisfying the exceptionally high standards for the course requirements, and on average have excellent performance in the first year of study with the majority falling within the range of first class grade.

In conclusion, this study revealed an association between exposure to adverse childhood experiences and adult psychosocial well-being with those exposed reporting poorer wellbeing and functioning; and a strong likelihood of having low self-esteem. No significant association was found between ACEs and academic performance, even though the performances were poorer than those of unexposed students. Additional research is required to provide more insight into stressors and how they may be influencing the relationship between ACE and psychosocial wellbeing amongst medical students. This may generate useful information to guide the development of structured interventions that will aim at improving the psychosocial wellbeing of medical students. Especially, as a big proportion may already be vulnerable to poor mental health by ACE(s) on the one hand; with the superimposed layer of the routine medical school stressors as an additional burden, on the other hand.

Acknowledgements

This study was supported by the Medical Education Partnership Initiative in Nigeria (MEPIN) Project, funded by Fogarty International Center, the Office of AIDS Research, and the National Human Genome Research Institute of the National Institute of Health, the Health Resources and Services Administration (HRSA) and the Office of the U.S. Global AIDS Coordinator under Award Number R24TW008878.

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