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Prevalence and Predictors of Depression among Adolescents in Ido Ekiti, South West Nigeria

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Abstract

Background: Depression among adolescents has been recognized as a public health problem all over the world. In Nigeria, as in most developing countries, there is a need for more research on the epidemiology of adolescent depression as this will guide prevention, diagnosis and treatment. **Objectives:** The study sought to determine the one month prevalence and predictors of depression among a sample of in-school adolescents in a rural region in South West Nigeria. **Materials and Methods:** This was a cross sectional descriptive survey among 540 secondary school students randomly selected from the six secondary schools in the study area using a Socio demographic Questionnaire and the Patient Health Questionnaire modified for Adolescents. Subsequently, a proportion of them were interviewed with the Kiddies Schedule for Affective Disorders and Schizophrenia. **Results:** Data were analyzed using the SPSS version 17. Respondents were aged 10 - 19 years (mean age was 14.07 ± 1.84). The one month prevalence of depression among the study population was 16.3% (using weighting method). Logistic regression analysis showed that death of a mother (OR = 11.786, 95% CI, 1.990 - 23.184), being from a polygamous family (OR = 5.781, 95% CI, 3.253 - 24.371), low socioeconomic class (OR = 6.222, 95% CI, 4.705 - 23.379), having a single parent (OR = 2.236, 95% CI, 0.869 - 11.786), having witnessed frequent violence (OR = 12.411, 95% CI, 0.516 - 29.851) and positive history of sexual abuse (OR = 0.203, 95% CI,

0.003 - 0.529) were significantly and independently associated with depression in this sample of adolescents. **Conclusion**: The one month prevalence of adolescent depression within the study population is slightly higher than what has been reported in other parts of the world. Therefore, there is a need for government to design and implement policies which can help to prevent, detect early, and treat depression among youths especially in rural areas.

Keywords

Prevalence, Depression, Adolescents, Predictors

1. Introduction

Depressive disorder as defined by the World Health Organization (WHO) is a mental disorder characterized by an all-encompassing low mood, loss of interest and enjoyment and reduced energy leading to increased fatigability and diminished activity [1]. It is the most common form of emotional problem experienced during adolescence and may be accompanied by inappropriate guilt or regret, worthlessness, hopelessness, and confused thinking [2] [3]. Depression in adolescents is a highly prevalent condition that is often under recognized by families and physicians alike [4]. One of the factors that make depression so difficult to diagnose in adolescents is the common behaviour changes that are normally associated with the hormonal changes of the period [5]. The reported one month prevalence rates of depression among adolescents in developed countries range between 3% - 20% with lifetime prevalence rates estimated to range from 15% - 35% by late adolescence [6].

In urban community settings of developing countries such as Kenya, Khasakhala *et al.* [7] reported 26.4% as the one month prevalence of depression among 1276 adolescents in Nairobi. In Nigeria, Omigbodun *et al.* [8] reported 12.6% as prevalence of probable depression among adolescents in rural South West Nigeria and found experiencing traumatic events as one of the predictors of depression especially when the event directly affected the youth as in sexual assault or physical abuse.

Nigeria has a relatively young population with 44% of the nation's population falling below the age of 19% and 55% of these live in rural area [9]. This study seeks to provide important information on the prevalence and predictors of depression among rural adolescents in this environment. It is hoped that a better understanding of adolescent depression in this environment will serve as a baseline for planning interventions for possible prevention, early detection and treatment.

2. Materials and Methods

This was a cross sectional descriptive survey conducted among secondary school students in Ido Ekiti, Ekiti State, Nigeria using a stratified proportional random

sampling to select respondents from the six secondary schools in the town. The location of the study was in IdoEkiti in Ido/Osi Local Government Area of Ekiti State in the South Western geographical zone of Nigeria.

The total number of students in the six secondary schools in Ido-Ekiti was 1771 comprising 1104 junior secondary school students and 667 senior secondary school students. Subjects included in this study were selected from the school register using a table of random numbers. Those who were absent on the day of the study and those who were not within the age range 10 - 19 years were skipped and replaced by other students from the class register using the same table of random numbers.

The study was carried out in two stages. The first stage involved administration of the Socio demographic Questionnaire and Patient Health Questionnaire-9 modified for adolescents (PHQ-A). This was followed up on the same day with a semi-structured diagnostic interview using the depressive disorders module of Kiddies-Schedule for Affective disorders and Schizophrenia (Kiddies-SADS) to those participants with scores suggestive of depressive disorder on PHQ-A namely all those with PHQ-A scores ≥ 5 which is the optimal cut off score for depressive disorders on PHQ-A validated in this environment [10]. Fifteen percent (15%) of those with PHQ-A scores < 5 were also randomly selected. This was in line with the two stage epidemiological study by Gureje *et al.* [11] to assess psychiatric disorders in a paediatric primary care clinic where 15% of those screened negative on Parents' version of Rutter scale were also subjected to the K-SADS. The randomization in this study was by writing YES or NO on papers which were rumpled and given to those who screened negative on PHQ-A and those who picked YES were interviewed with depressive disorder module of Kiddies-SADS in the second stage to correct for possible missed cases, thus improving the yield of identified cases.

Students were eligible for participation if they were between 10 and 19 years of age and had given assent and had oral/written consent from their parents/ guardians. Students were excluded if they were severely physically ill during the period of questionnaire administration, had a previous history of mental illness as ascertained by the Socio-Demographic Questionnaire.

The study protocol was approved by the Research and Ethical Committee of the Federal Teaching Hospital, Ido-Ekiti. Written permission was obtained from Ido/Osi Local Government Area Education Office and the principals of the participating schools. Participation was voluntary and informed consent was obtained from the parents of the respondents while the adolescents' assent was also obtained.

The sample size that was used for this study was computed based on the Cochrane formula for calculating sample size in cross sectional studies [12] while adjusting for a design effect using the prevalence rate of 12.1% of depressive disorder among adolescents in rural South Western Nigeria [13]. Adjusting for non response rate of 10%, an estimated sample size of 540 was chosen to in-

crease the statistical power of the study.

Data was collected using a semi structured questionnaire for socio demographic characteristics of respondents and a Patient Health Questionnaire (PHQ-9) modified for Adolescents (PHQ-A) and Kiddies-Schedule for Affective disorders and Schizophrenia (Kiddies-SADS).

The Patient Health Questionnaire (PHQ-9) modified for Adolescents (PHQ-A) is a nine item questionnaire which screens for depression. It is useful for assisting primary care clinicians in screening for depression as well as monitoring treatment. The PHQ-9 scores each of the nine DSM-IV criteria as "O" (not at all) to "3" (nearly every day). It has been validated for use in Nigeria by Adewuya *et al.* [10] who reported an internal consistency of 0.85 and optimal cut-off score for depressive disorder as 5 (sensitivity 0.897, specificity 0.989, positive predictive value 0.875, negative predictive value 0.981). The PHQ-A was modified from PHQ-9 for use in adolescents where it also has acceptable psychometric properties [14] [15] [16].

In this study, a cut off of 5 was employed as cut off for depression as recommended by Adewuya *et al* [10]. This cut off has been used in South West, Nigeria to assess the prevalence and predictors of depression among school adolescents in a rural area in Oyo State [17].

The Kiddies-Schedule for Affective disorders and Schizophrenia (Kiddies-SADS) is a semi structured diagnostic interview designed to assess current and past episodes of psychopathology in children and adolescents according to Diagnostic and Statistical Manual of Mental Disorders third and fourth edition criteria (DSM-III and IV) [18]. However, in this study, only the current episode in the last one month was elicited using the depressive disorder module of Kiddies-SADS.

A pre-test was conducted in a non-participating secondary school (OraEkiti Community High School, OraEkiti) which is about 3 kilometers away from the study area. This aimed at ascertaining the duration of administration and acceptability of instruments used in the main study. Areas of difficulties that could be encountered during the main study were also identified.

This cross sectional survey was carried out between the month of December 2013 and January, 2014. The investigators ensured that a separate classroom was provided for the conduct of the interview with the students. Also, the different schools were asked to give convenient days and free periods for data collection based on the weekly programme of each school to minimize disruption in school activities. With the collaboration of the teachers, the selected students were moved to a separate classroom where instructions were given to them as to how the interview would be conducted in order to ensure confidentiality and an atmosphere devoid of intimidation.

The selected students were also advised to bring one of their parents/guardians to the school on the day of interview to corroborate the depressive symptoms. The students were educated about mental health and psychosocial consequences

of depression at the end of the data collection process in each school. After the study interviews, the investigators went back to the different schools to identify students who were found to be depressed. The students who were found to be mildly depressed were referred to their school counsellors and those severely depressed to the mental health department of the Federal Teaching Hospital, Ido-Ekiti, Ekiti State.

The data obtained were coded where appropriate, entered and analyzed using the SPSS version 17. Data exploration was carried out using frequencies. Data was summarized using frequencies, percentages, means and standard deviation. The Chi square test was used to test for associations between categorical variables (socio demographic variables) and outcome variables (depression) while the binary logistic regression was used to determine the variables that were independently associated with depression. The level of significance was set at 0.05, two tailed.

3. Results

3.1. Socio Demographic Characteristics of Respondents

The study population was made up of 276 (51.1%) males and 264 (48.9%) females giving a male: female ratio of 1.1:1. Their ages ranged from 10 to 19years with a mean age of 14.07 years (SD ± 1.84). More than half of them (58.0%) were in the age range of 13 - 15 years, about one fifth of them (19.6%) were in the age range 10 - 12 years, and those in the age group 15 - 19 years were 22.4%. Majority (81.7%) were Christians and about one sixth of them (16.7%) were Muslims. A little above half (57.6%) were in public schools. About two thirds of them (62.4%) were in the junior secondary school class (JSS1-JSS3).

Majority of the fathers of the respondents had at least secondary education (73.9%) and were in the intermediate occupational class or artisans/drivers (74.5%). Also, majority of the mothers of the respondents had at least secondary school education (76.9%) and were in the intermediate occupational class or artisans/drivers group (75.6%). Forty three percent of the respondents were from middle and high socio economic classes (See Table 1).

3.2. Family Characteristics and Social Relationships of Respondents

Majority of them (60.6%) were from monogamous family setting while 39.4% were of polygamous family. Almost half of the respondents (47.2%) lived with both parents. About one fifth of them (22.2%) had lost their mother. About one quarter of them (24.4%) had widowed parents, 11.3% had divorced parents while 58.5% reported that their biological parents were married.

Majority reported cordial relationships with their parents, siblings, teachers and school mates (76.3%, 87.6%, 88.1% and 94.3% respectively) (See Table 2).

3.3. Prevalence of Depression

The prevalence of depression among the respondents was 16.3% using sampling

Table 1. Socio demographic characteristics of respondents N = 540.

Variables	Frequency (n)	Percent (%)
Age group (yrs)		
10 - 12	106	19.6
13 - 15	313	58.0
16 - 19	121	22.4
Gender		
Male	276	51.1
Female	264	48.9
Religion		
Islam	90	16.7
Christianity	441	81.7
*Others	9	1.6
School type		
Public schools	311	57.6
Private schools	229	42.4
Class groups		
JSS Class	337	62.4
SSS Class	203	37.6
Father's Education		
Tertiary	255	47.2
Secondary	144	26.7
Primary	131	24.3
None	10	1.9
Father's Occupation		
Professionals	49	9.1
Intermediate	176	32.6
Artisans and Drivers	226	41.9
Petty traders and Messengers	89	16.5
Mother's Education		
Tertiary	211	39.1
Secondary	204	37.8
Primary	102	18.9
None	23	4.3
Mother's Occupation		
Professionals	59	10.9
Intermediate	209	38.7
Artisans and Drivers	199	36.9
Petty traders and Messengers	73	13.5
Social class		
Upper class	37	6.9
Middle class	195	36.1
Lower class	308	57.0

*Others: traditional religion.

Table 2. Family characteristics and social relationships of respondents.

Variables	Frequency (%)	Percent (n)
Current living status		
Both Parents	255	47.2
Single parent	135	25.0
*Others	150	27.8
Status of parent		
Father dead	41	7.6
Mother dead	120	22.2
Parent's Marital Status		
Never Married	21	3.9
Married	316	58.5
Divorced	61	11.3
Widowed	132	24.4
Both Parents dead	10	1.9
Type of Family		
Monogamous	327	60.6
Polygamous	213	39.4
Birth order		
First (Eldest Child)	148	27.4
Lastborn	135	25.0
Only Child	22	4.1
Others (2nd, 3rd, 4th etc)	235	43.5
Relationship with Father		
Not applicable (Dead or not around)	38	7.0
Cordial	412	76.3
Not Cordial	90	16.7
Relationship with mother		
Not applicable (Dead or not around)	75	13.9
Cordial	448	83.0
Not Cordial	17	3.1
Relationship with siblings		
Not applicable (No siblings)	19	3.5
Cordial	473	87.6
Not Cordial	48	8.9
Relationship with Teachers		
Cordial	476	88.1
Not Cordial	64	11.9
Relationship with School mates		
Cordial	509	94.3
Not Cordial	29	5.4
No response	2	0.4

*Others: aunties, uncles, cousins.

weights. Those in the age group greater than 15 years had a higher prevalence (23.1%) than those in the age groups 13 - 15 years (13.7%) and 10 - 12 years (13.2%). Female adolescents had a higher prevalence (19.9%) than their male counterparts (12.9%). Respondents in public schools had a higher prevalence (18.0%) than those in private schools (14.9%). Adolescents in the senior secondary class group (SSSI-SSS3) had higher prevalence of 18.1% than those in the junior secondary class group of 15.3% (See Table 3).

3.4. Association between Depression and Socio Demographic Variables

Older age was significantly associated with depression as respondents in the 15 - 19 years category (23.1%) were found to be depressed when compared to those aged 13 - 15 years (13.7%) and 10 - 12 years (13.2%) (x^2 = 12.159, df = 2, p = 0.002). Gender was not significantly associated with depression as the proportion of males (12.9%) who were found to be depressed were not significantly different from the proportion of females (19.9%) who were found to be depressed. (x^2 = 0.035, df = 1, p = 0.852) (See Table 4).

Table 3. Prevalence of depression among respondents.

Category	Total, n	Prevalence (95% CI)%	
		Unweighted	Weighted
Total	182	33.7 (29.8 - 37.8)	16.3 (14.6 - 18.2)
Age group (yrs)			
10 - 12	21	19.8 (13.3 - 28.4)	13.2 (10.6 - 16.4)
13 - 15	112	35.8 (30.7 - 41.2)	13.7 (11.3 - 16.7)
>15	49	40.5 (32.2 - 49.4)	23.1 (19.6 - 27.1)
Gender			
Male	92	33.3 (28.0 - 39.1)	12.9 (10.8 - 15.3)
Female	90	34.1 (28.6 - 40.0)	19.9 (17.3 - 22.8)
School			
Oganganmodun	76	43.2 (36.1 - 50.6)	13.6 (10.9 - 17.0)
Ekitiparapo	46	34.1 (26.6 - 42.4)	16.4 (13.1 - 20.4)
Liberty	32	32.0 (23.7 - 41.7)	19.8 (15.6 - 24.7)
OkeOsanyintolu	16	23.2 (14.8 - 34.4)	16.5 (12.0 - 22.3)
Christ Public.	8	22.2 (11.7 - 38.1)	18.8 (13.6 - 25.4)
Christ-Led College	4	16.7 (6.7 - 35.9)	14.6 (8.9 - 23.0)
School type			
Public schools	122	39.2 (34.0 - 44.8)	18.0 (15.5 - 20.9)
Private schools	60	26.2 (20.9 - 32.3)	14.9 (12.7 - 17.4)
Class type			
JSS Class	102	30.3 (25.6 - 35.4)	15.3 (13.2 - 17.6)
SSS Class	80	39.4 (29.4 - 44.6)	18.1 (15.3 - 21.4)

Table 4. Association between depression and socio demographic characteristics of respondents (N = 540).

Variables	Depressed	Not Depressed	χ^2	df	P value
Age group (yrs)					
10 - 12	21 (19.8)	85 (80.2)	12.259	2	**0.002***
13 - 15	112 (35.8)	201 (64.2)			
16 - 19	49 (40.5)	72 (59.5)			
Gender					
Male	92 (33.3)	184 (66.7)	0.035	1	0.852
Female	90 (34.1)	174 (65.9)			
Religion					
Islam	27 (30.0)	63 (70.0)	0.668	2	0.716
Christianity	152 (34.5)	289 (65.5)			
*Others	3 (33.3)	6 (66.7)			
School type					
Public schools	122 (39.2)	189 (60.8)	10.017	1	**0.002***
Private schools	60 (26.2)	169 (73.8)			
Class groups					
JSS Class	102 (30.3)	235 (69.7)	4.738	1	**<0.001***
SSS Class	80 (39.4)	123 (60.6)			
Father's Education					
Tertiary	31 (12.2)	224 (87.8)	148.65	3	**<0.001***
Secondary	51 (35.4)	93 (64.6)			
Primary	97 (74.0)	34 (26.0)			
None	3 (30.0)	7 (70.0)			
Father's Occupation					
Professionals	2 (4.1)	47 (95.9)	97.576	3	**<0.001***
Intermediate	32 (18.2)	144 (81.8)			
Artisans and Drivers	84 (37.2)	142 (62.8)			
Petty trader and Messengers	64 (71.9)	25 (28.1)			
Mother's Education					
Tertiary	14 (6.6)	197 (93.4)	155.286	3	**<0.001***
Secondary	85 (41.7)	119 (58.3)			
Primary	77 (75.5)	25 (24.5)			
None	6 (26.1)	17 (73.9)			
Mothers Occupation					
Professionals	3 (5.1)	56 (94.9)	104.351	3	**<0.001***
Intermediate	49 (23.4)	160 (76.6)			
Artisans and Drivers	71 (35.7)	128 (64.3)			
Petty trader and Messengers	59 (80.8)	14 (19.2)			
Social class					
Upper class	8 (4.0)	29 (96.0)	138.786	2	**<0.001***
Middle class	63 (32.3)	132 (67.7)			
Lower class	111(36.0)	197(64.0)			

*Significant at p value <0.05.

A higher proportion of subjects from senior secondary class (18.1%) were found to be depressed when compared to those in the junior secondary class (15.3%) and this was statistically significant (x^2 = 4.738, df = 1, p ≤ 0.001). Low socioeconomic class was also significantly associated with depression as a higher proportion of respondents in the low socioeconomic class (36.0%) were found to be depressed when compared to those in the upper socioeconomic class (4.0%). (x^2 = 195.688, df = 2, p < 0.001) (See Table 4).

3.5. Factors Independently Associated with Depression

The socio demographic variables that were significantly associated with depression on chi square analysis were entered into a logistic regression analysis equation. These were age, school type, class group, current living status, death of parent(s), type of family, birth order, social class, relationships with father, mother, siblings, and teachers. Others were academic performance, witness of neighbourhood violence and report of sexual/physical abuse (See Table 5). Independent variables with two categories or more had their first category taken as reference and assigned an odd ratio of 1, while the effect of other categories was compared with this reference category.

Logistic regression analysis showed that lower social class was found to have a six fold increase in the risk of depression when compared to those in the upper class (OR = 6.222, 95% CI, 4.705 - 23.379). Death of mother also increased the risk of depression by almost twelve fold and was found to be significantly and independently associated with depression (OR = 11.786, 95% CI, 1.990 - 23.184).

Being from a polygamous family setting increased the chance of being depressed by approximately six fold when compared to those from monogamous family (OR = 5.781, 95% CI, 3.253 - 24.371). Having witnessed neighbourhood violence frequently also increased the risk of being a depressed by twelve fold when compared to those who never witnessed neighbourhood violence (OR = 12.411, 95% CI, 0.516 - 29.851).

Negative history of sexual abuse was found to be significantly protective against depression as respondents who had negative history of sexual abuse were five times less likely to be depressed when compared to those who had positive history of sexual abuse (OR = 0.203, 95% CI, 0.003 - 0.529) (See Table 5). Cordial relationship with mother was also found to be significantly protective against depression as respondents who had cordial relationship with their mothers were four times less likely to be depressed when compared to those who had no cordial relationship with their mothers (OR = 0.252, 95% CI; 0.000 - 0.358).

4. Discussion

The one month prevalence rate of depression of 16.3% obtained in this study is within the range of findings from previous studies from developing and developed countries [4] [13]. Omigbodun *et al* [13], in a cross sectional study among 484 adolescent students in two rural districts of South Western Nigeria using the

Table 5. Logistic regression analysis for the variables independently associated with depression.

Variables		B	OR (95% CI)	P value
Age group (yrs)	10 - 12		1	
	13 - 15	−0.941	0.390 (0.065 - 2.353)	0.305
	>15	−0.800	0.449 (0.007 - 29.538)	0.708
School type	Public		1	
	Private	0.135	1.145 (0.212 - 6.192)	0.875
Class groups	JSS Class		1	
	SSS Class	−0.610	0.543 (0.032 - 9.357)	0.674
Social class	Upper class		1	
	Middle class	1.999	5.381 (0.898 - 60.648)	0.063
	Lower class	4.131	6.222 (4.705 - 23.379)	**0.002**
Current living status	Both Parents		1	
	Single parent	2.521	2.236 (0.869-11.786)	**0.006**
	*Others	3.616	5.125 (4.136 - 20.789)	**0.011**
Death of parent (Father)	No		1	
	Yes	−1.781	0.168 (0.009 - 3.055)	0.228
Death of parent (Mother)	No		1	
	Yes	4.770	11.786 (1.990 - 23.184)	**0.022**
Type of Family	Monogamy		1	
	Polygamy	3.577	5.781 (3.253 - 24.371)	**<0.001**
Birth order	First (Eldest Child)		1	
	Lastborn	−0.357	0.700 (0.038 - 12.880)	0.810
	Only Child	−5.908	0.003 (0.000 - 24.314)	0.203
	Others	0.869	2.384 (0.234 - 24.323)	0.463
Relationship with Father	None		1	
	Cordial	0.256	1.292 (0.059 - 28.249)	0.871
	Not Cordial	3.760	4.293 (0.936 - 19.680)	0.054
Relationship with mother	None		1	
	Cordial	−5.016	0.252 (0.000 - 0.358)	**0.014**
	Not Cordial	3.308	27.331 (0.012 - 62.402)	0.402
Relationship with siblings	None		1	
	Cordial	−0.684	0.504 (0.001 - 21.309)	0.824
	Not Cordial	1.810	6.109 (0.005 - 24.116)	0.623
Relationship with Teachers	Cordial		1	
	Not Cordial	−2.093	0.123 (0.006 - 2.519)	0.174
Self-rated academic performance	Above Average		1	
	Average	1.218	3.380 (0.010 - 11.258)	0.681

Continued

	Below Average	4.828	12.495 (0.299 - 52.237)	0.117
Witnessed neighbourhood Violence	Never		1	
	Sometimes	1.319	3.738 (0.207 - 67.645)	0.372
	Always	2.519	12.411 (0.516 - 29.851)	**0.018**
Report of Sexual abuse	Present		1	
	Absent	−3.261	0.203 (0.003 - 0.529)	**0.015**
Report of Physical abuse	Present		1	
	Absent	0.187	1.205 (0.075 - 19.464)	0.895
Constant		−3.678		0.003

*Others: aunties, uncles and cousins.

Diagnostic Interview Schedule for Children (DISC) reported a prevalence rate of probable depression to be 12.1%. This prevalence is slightly lower than 16.3% obtained in this study. This variation in the finding from Omigbodun *et al.* [13] study compared to the current study may be due to varying methodological factors.

A more recent study by Fatiregun and Kumapayi in 2014 using Patient Health Questionnaire modified for adolescents reported the prevalence of depressive symptoms to be 21.2% among school adolescents in a rural district of Egbeda Local Government Area of Oyo State [17]. This prevalence rate is slightly higher than that obtained in this present study probably because only a screening instrument (the PHQ-A) was used in their study and no further diagnostic testing was done.

In other parts of developing world such as India, Nagendra *et al.* [19] using the Becks Depression Inventory reported a one month prevalence rate of depressive symptoms to be 57.7% in a sample of 3141 adolescent students within the age range 15 - 19 years among public and private secondary school students. This prevalence is significantly higher than that observed in this study. This observation may be readily explained by variation in the instruments.

The prevalence of 16.3% in this study also correlates well with the findings of Saluja *et al.* [4] in the United States of America where a one month prevalence of depression among 863 young adolescents was reported as 18% using the Composite International Diagnostic Interview (CIDI). The slight difference in the rates between this study and the work of Saluja *et al.* [4] may be due to the different ages of the participants studied. Saluja *et al.* [4] studied adolescents of narrower age range of 11 - 15 years while in this present study, those who participated were adolescents of broader age range of 10 - 19 years. The reasons for the observed differences in prevalence rates of depression in this study compared to some of the cited studies may be due to methodological issues like sampling,

study design and instruments used.

This study also found that the proportion of older adolescents in the age range 16 - 19 years who were found to be depressed was higher than the proportion of younger adolescents in the age range 10 - 12 years who were found to be depressed. Said and Hasan [20] also found similar results carried out among Turkish adolescents where they found that older adolescents reported depressive symptoms than younger adolescents. Possible reasons for this could be, societal expectations from older adolescents such as better academic performance, better conduct than the younger ones, hence they are more likely to experience more stressors than the younger adolescents [21]. Hormonally-linked heightened stress sensitivity in the older adolescents has been associated with higher prevalence estimates of depression among the older adolescents [22]. This is because hormonal changes produce behavioural and neural signs of depression by sensitizing the brain to the harmful effects of stress [22].

Socioeconomic class was also found to be significantly associated with depression in this study as students from lower socioeconomic status were six times more likely to be depressed than students from the upper socioeconomic status. This has been observed in other similar studies conducted in other parts of the world where they found that poverty and difficulties in meeting daily necessities may induce a child to compare himself with others and this situation increases child's tendency to depression [23] [24].

This present study also found that adolescents from polygamous families were almost six times more likely to be depressed than those from monogamous families and this was significantly and independently associated with depression on logistic regression. Previous studies have also linked polygamous family settings to adolescent depression [25] [26]. This might be due to parents in polygamous family settings being unable to fulfil the needs of their growing children as a result of more numbers in the family. Such needs would include food, clothing, education, love, care, emotional support, parental support and financial needs.

The finding of significant relationship between parental separation/divorce and depression in this study is in keeping with findings from other studies [27] [28]. These adolescents from separated/divorced families tend to be more depressed than their same aged peers from intact families. This could be, because such adolescents from divorced home tend to have less intimate relationship with their parents.

Death of a parent was also found to be significantly associated with adolescent depression in this study. Previous researchers have reported that adolescents who had experienced parental death were more likely to be depressed than those who had not [29] [30]. The reason for this observation is obvious, since such adolescents are often deprived of secure and loving relationships with their parents and these are protective factors that reduce the rate of emotional disorders among adolescents [31].

This study revealed that the one month prevalence of depression among ado-

lescents in rural area appears slightly higher than that in urban area and is significantly and independently associated with lower socioeconomic class, polygamous family setting, having a single parent, death of a mother, witnessing of frequent violence and sexual abuse.

Clinicians practicing in rural areas therefore need a higher index of suspicion for this disorder when managing adolescents. General physicians and primary health workers also need training to recognize this disorder, as they are more likely to see patients in the early stages before co-morbid conditions develop. The factors identified to be significantly associated with adolescent depression may also be helpful when designing and implementing preventive or in intervention programs.

5. Limitations

1) This study was cross sectional in design; a longitudinal study would have provided more information as to cause and effect of depression in adolescent subjects. However, time constraints would not allow such a study design.

2) This study did not assess the severity nor co-morbidity associated with depression.

3) The instruments used for the screening and diagnosis of depression in this study were not translated to the local language of the respondents. However, efforts were made to ensure that the questions were properly understood by the participants.

4) Correlates such as sexual abuse, physical abuse and violence were self reported by the study participants and it is possible there might have been some recall bias.

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