Original Research Article

Socio-demographic and HIV-related factors associated with Depression among Retroviral Positive Adolescents in Port Harcourt

Abstract

Introduction: Depression with HIV constitute a co-morbid condition associated with severe sequalae, which include deliberate self-harm and suicide, even among adolescents. Identifying demographic and HIV-related determinants of depression among adolescents living with HIV is vital for instituting relevant evidence-based interventions for curbing this problem. Thus this aimed to determine the relationship between these factors (socio-demographic and HIV-related factors) and depression among adolescents living with HIV.

Methods: A cross-sectional hospital-based study was employed. It involved 140 HIV-infected adolescents, who were selected from the HIV Paediatric clinic of the University of Port Harcourt Teaching Hospital (UPTH) via systematic sampling method. Depression was determined based on the depression component of the depression anxiety stress scale (DASS-21), while social support was assessed using the social support rating scale. Socio-demographic and HIV-related factors comprised independent variables, while dependent variable was depression. Bivariate and multivariate analyses were performed at $p<0.05$.

Results: The mean (±) age of HIV-infected adolescents in the study was 14.05±2.68years. Close to half of the adolescents in the study had been living with HIV from birth (46.4%;n=65). The prevalence of depression was 14.2% (n=20). HIV-infected adolescents aged ≥16 years were four times more likely to experience depression than their younger aged counterparts

(AOR:4.40;95%CI:1.42-13.70). Also, those with higher social support had significantly lower odds of experiencing depression (AOR:0.94;95%CI:0.90-0.99).

Conclusion: About 1 in 7 adolescents living with HIV are burdened with depression in the study area. Social support and age of adolescents showed significant relationship with depression in the study. The integration of mental health in Paediatric HIV care could optimize health outcomes.

Keywords: depression, adolescents, HIV, mental health,

Introduction

Globally, 1.71 million adolescents aged 10-19 years were living with Human Immunodeficiency Virus (HIV) in 2021, with 85% of this number (1.47million) living in sub-Saharan Africa.[1] In Nigeria, a total of 140,000 adolescents were living with HIV in 2020,[2] while an estimated 1.2 million children were orphaned by Acquired Immune Deficiency Syndrome (AIDS).[3] Undoubtedly, HIV in children and adolescents remain a serious public health concern. Health outcomes for adolescents living with HIV in Nigeria are poor, and Nigeria is the only country in the world where mortality in 10-14-year-olds is rising. [4]

Children and adolescents are an ever-growing part of the HIV/AIDS epidemic, and suffer from varying psychological and social effects of the disease.[5] HIV/AIDS can increase the risk of mental illness such as depression, while poor mental health can inspire behaviours which place individuals at risk for HIV/AIDS. Amongst other indicators of psychological morbidity, depression has been identified as one of the most common mental health conditions amongst adolescents living with HIV and AIDS.[6] Social and emotional development among young people

infected with HIV can breed a sense of social isolation, hopelessness, and depression.[6,7] The psychological and social effects of HIV/AIDS are actually magnified in young people.[8]

Previous studies and reports have documented the presence of depression among adolescents living with HIV/AIDs. In Kenya, Kamau et al. reported that 17.8% had depressive disorder.[9] Another cross-sectional study of HIV-infected adolescents from Malawi found a depression prevalence of 18.9%.[10] Studies in Tanzania and Nigeria reported a depression prevalence of 27% and 20% respectively among HIV-infected children and adolescents.[11,12] Although, these studies expose the uncommonness of depression among adolescents, there is need to uncover the socio-demographic and HIV-related determinants of depression as a basis for evidence-based strategies and policies for curbing this public health problem. Also, intervention such as the integration of mental health services in the care of adolescents living with HIV is absent in Nigeria and most parts of sub-Saharan Africa. Therefore, this study hopes to enrich the body of literature by providing evidence-based information on the socio-demographic and HIV-related factors that contribute to depression burden among adolescents living with HIV. Identifying the determinants of depression could serve as knobs for turning down the prevalence and promoting better outcomes among HIV-infected adolescents. The study hypothesized that depression is associated with socio-demographic and HIV-related factors among adolescents.

Methods

Study area: This study was carried out in the University of Port Harcourt Teaching Hospital (UPTH), Rivers State, Nigeria. It is a major tertiary health care facility in the state. It has a peak annual patient visitation of 200,000 patients with over 500 beds for patient admissions. The HIV clinic in UPTH provides highly active antiretroviral therapy (HAART) for about 11,000 clients including children and adolescents who are accessing care in the University of Port Harcourt

Teaching Hospital. There are 263 registered adolescents receiving HAART in the paediatric HIV clinic, with a weekly client attendance of 20-30 HIV-infected adolescents.

Study design: A hospital-based cross-sectional study was employed in the study.

Study population: Adolescents, aged 10 – 19 years who were HIV positive and were attendees of the paediatric HIV Clinic of the University of Port Harcourt Teaching Hospital comprised the study population. HIV positive adolescents who were severely ill were precluded from the study.

Ethical consideration: Ethical clearance for the study was obtained from the Research and Ethics Committee of the University of Port Harcourt Teaching Hospital (UPTH). Written informed consent was obtained from parents/guardian of the adolescents in the study, and verbal assent was obtained from each of the adolescents prior to their inclusion into the study. Confidentiality and anonymity were maintained in the study. The respondents were free to withdraw from the study with no form of penalty. The participants who were found to have manifestations of depression were counselled and subsequently referred to the mental health clinic for expert evaluation and treatment as necessary.

Sample size calculation: The sample size was determined using the formula for cross-sectional studies.[13]

$$n = \frac{(Z\alpha + Z\beta)^2 (p)(1-p)}{(e)^2}$$

Where:

n = minimum sample size

Z α = standard normal deviate of 0.05 significant level corresponds to 1.96

Zβ = power of study of 80% corresponds to 0.84

p = proportion of depression among children and adolescents from Nigerian study was 20%[12]

e = precision level of 0.1

A minimum sample size of 125 was obtained. Adjustment for 10% non-response yielded a sample size of approximately 140, which was adopted in the study.

Sampling technique: A systematic random sampling technique was used to select study participants from the Paediatric HIV Clinic. This was based on a calculated sampling interval as follows: Population size ÷ sample size. In this study, the population size was 263 and the sample size is 140 per group, giving a sampling interval of ~ 2. Thus, every 2nd HIV-infected adolescent was selected from the Paediatric HIV Clinic after the adoption of simple random sampling in identifying the random start i.e. the first study participant.

Data collection: This study was carried out from January 3rd 2021 to May 3rd 2021 (a period of 4 months). The socio-demographic characteristics (age, sex, educational level, socio-economic status, social support) and HIV-related characteristics (duration of HIV, duration of ARV, consistency with ARV, method of HIV discovery, and viral load) comprised the independent variables for the study. The dependent variable was depression (yes/no).

Depression was determined using the depression component of the depression anxiety stress scale (DASS-21). Each item is scored from 0 (did not apply to me) to 3 (applied to me very much or most of the time). For the depression domain, normal scores range from "0 to 9 while higher scores range from 10 to 28".[14] This scale has been validated in a Nigerian study among medical students from the Lagos State University College of Medicine with a Cronbach's alpha value of 0.81 for the subscale of depression.[15] Other studies have similarly demonstrated the usefulness of the tool.[16,17]

Social support was assessed using the multidimensional scale of perceived social support rating scale, which captures forms and degrees of social support from family, friends and significant others and was shown to be a psychometrically sound instrument with good total scale reliability

(cronbach alpha of 0.88).[18] It was used to measure the degree to which respondents felt satisfied with evaluable social support and sources of their support. It is a 12-item format scale which is scored on five points ranging from 1 (strongly disagree) to 7 (strongly agree). Higher scores of 61 to 84 indicates a high level of satisfaction with social support.[19] The instrument was also found to have adequate reliability with McDonald's omega value of above or equal to 0.70 in in in correlation to other study measures among students in Nigeria.[20]

Socioeconomic status was determined using the Oyedeji Classification of Social Class Instrument.[21] The occupation and the educational attainment of the parents are used to determine the socio-economic index scores of the subjects. Each subject will be assigned scores based on the parent's (father s and mother's) education and occupation. The scores (two for the father and two for the mother) will be summed up and the mean (approximated to the nearest whole number) obtained. The mean of four scores will be used to assign the subject to one of the socioeconomic groups (I-V). A person with a score of I to II was grouped in the high socioeconomic class; III to IV was grouped into middle, and V was grouped into low socioeconomic class.

The most recent viral load within (3 months from date of data collection) of each participant was obtained from their medical records. Socio-demographic questionnaire was used to obtain information to responses on demographic and HIV-related factors.

Statistical analysis: SAS OnDemand for Academic was employed in performing descriptive and inferential statistics. Data were summarized as frequencies and proportions for categorical variables while numerical variables were expressed as means and standard deviation. Independent t test was used for comparison of means across presence/absence of depression. Chi Square statistics was employed to compare differences in proportions. Binary logistic regression

model was performed to identify determinants of depression among adolescents in the study. Collinear independent variables were not included in the model. Statistical significance was set at $p<0.05$. Adjusted odds ratio and 95% confidence intervals were determined.

Results

Socio-demographic characteristics

The mean age of the adolescents living with HIV in this study was 14.05 years (SD=2.68). Females were more, with a proportion of 55%(n=77). The highest proportion of the adolescents were in tertiary level of education (40.7%) and belonged to upper socio-economic status (49.2%). (Table 1)

HIV-related characteristics

Close to half of the adolescents in the study were living with HIV from birth (46.4%). They were all on antiretroviral drugs(ARV), and about 42% were on ARVs for longer than seven years. Majority of them (92%) were consistent with ARVs. About five percent discovered their status from a mandatory test without counselling. More than half of the adolescents in the study had viral load counts that were less than 100cells/ml (55.0%).

Depression prevalence and comparison of social support scores by depression status

Twenty of the 140 adolescents had depression yielding a prevalence of 14.2%. Comparison of social support scores across depressed and non-depressed adolescents showed values of 51.05±11.30 and 55.00±13.33 respectively (t=1.25;p=0.2129).

Socio-demographic/HIV-related factors and Depression

Bivariate analysis

Adolescents aged 16-19 years had significantly higher proportion of depression (26%) in comparison to the 10-12years (4.0%) and 13-15years (13.3%) age groups (p=0.0068). There was

no significant difference in proportion of depression across the sex of the adolescents (p=0.3316). The study noted that those with tertiary level of education had significantly higher proportion of depression (28.1%) in comparison to those in primary and secondary levels, which reported rates of 3.7% and 5.4% respectively (p=0.0006). Also, those belonging to upper and middle socio-economic status had significantly higher prevalence of depression in comparison to those of the low class (p=0.0482).(Table 2)

The HIV-related characteristics collected in this study; HIV duration (p=0.3191),duration on ARV (p=0.6287), consistency of ARV (p=0.1997), method of HIV discovery (0.1290) and viral load (0.2480) showed no significant relationship with depression. (Table 2)

Multivariate analysis

After adjusting for other socio-demographic and HIV-related factors, age of the adolescents and social support were significantly associated with depression in the study ($p<0.05$). Adolescents who were aged 16 years and above were about four times more likely to experience depression than those below 16years (AOR:4.40;95%CI:1.42-13.70) as shown in Table 3. Those with higher social support had significantly lower odds of experiencing depression (AOR:0.94;95%CI:0.90-0.99). (Table 3).

Discussion

This study was carried out to evaluate the prevalence and factors of depression in HIV-infected adolescents who were attending the Peadiatric HIV clinic of the University of Port Harcourt Teaching Hospital. It revealed a depression prevalence of 14.2%, which implies that 1 in 7 adolescents living with HIV experienced depression. The findings of the index study is

somewhat consistent with other African studies in Kenya, Malawi, and Tanzania.[9,10,11] Also, the finding is comparable to that of Bankole et al. in Nigeria, who found a prevalence of 20% among children and adolescents living with HIV.[12] These findings along with the index study highlight the need to address depression among HIV-infected adolescents. This is inevitable to forestalling the consequences of untreated depression, which include deliberate self-harm and suicide.

Sadly, in most adolescent care centres and HIV clinics, routine screening for depression among adolescents is yet to be effectively undertaken. Thus, depression and other mental health problems remain undetected and therefeore untreated. This lack of routine screening may be due to a shortage of mental health professionals, limited medical resources especially for mental health services, and the societal perception that mental health care is not a priority. Implementing routine screening for depression among HIV-infected adolescents could allow this high-risk population to get the mental health treatment they need and avoid the long-term risks associated with the comorbidity of depression and HIV.

Concerning the determinants of depression among adolescents living with HIV, age and social support were identified in this study. The finding that older adolescents aged 16years and above had higher odds of depression possibly connote the greater awareness and understanding of the implications of living with HIV, and fear of stigmatisation by their peers. This finding is consistent with that of Bankole et al., in which higher rates of depression was observed among the upper adolescent age group.[12] Therefore, interventions targeted at promoting mental health among adolescents should prioritize older aged adolescents. The role of social support in depression has been previously highlighted in research.[22] Social support groups in HIV care have seemingly focused on adults living with HIV, while neglecting children and adolescents. The

study stresses the importance of promoting social support in curbing the menace of depression among adolescents.

None of the HIV-related factors investigated in this study showed significant relationship with depression. This finding is therefeore in line with the assertion that it is the social, and psychological stressors associated with living with HIV/AIDS that makes adolescents vulnerable to depression.[23] The study noted that almost half of the adolescents in the study had been living with HIV from birth, which reveals the several missed opportunities for the prevention of mother-to-child transmission (PMTCT). This could be due to lack of adequate interventions targeted at PMTCT. Hence the need to upscale and strengthen PMTCT interventions across the country. Notably, the finding of viral load of ≤1000cells/ml in most of the adolescents living with HIV in the study indicates a good viral suppression, which is consistent with a previous study that examined the clinical profile and viral load suppression among HIV-positive adolescents attending a tertiary hospital in North Central Nigeria.[24]

This study has provided evidence-based information concerning depression among adolescents living with HIV, which could form basis for advocacy, policies and interventions targeted at optimizing mental health outcomes for this group of adolescents. The cross-sectional nature of the study precludes causality, thus the significant factors identified for depression are not causal, but reveal possible associations. The lack of a comparison group comprising HIV uninfected adolescents in this study is another limitation, which provides a gap in knowledge. Thus, further studies could explore analytic study designs.

Conclusion

About one in seven HIV-infected adolescents experience depression. Older adolescents, aged 16years and above are about four times more likely to experience depression than their younger

counterparts. Higher social support was also linked to lower odds of experiencing depression. The need to integrate mental health services in paediatric HIV care is highlighted by the findings of the study.

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Table 1: Socio-demographic and HIV-related characteristics of adolescents living with HIV

Variables	Frequency (N=140)	Percentage (%)
Age category		
10 – 12 years	50	35.8
13 – 15 years	45	32.1
16 – 19 years	45	32.1
Sex		
Male	63	45.0
Female	77	55.0
Educational level		
Primary	27	19.3
Secondary	56	40.0
Tertiary	57	40.7
Socio-economic status		
Upper	69	49.2
Middle	32	22.9
Low	39	27.9
Duration of living with HIV		
1 – 2 years	13	9.3
> 2 – 4 years	18	12.9
5 – 7 years	20	14.3
> 7 years	24	17.1
From birth	65	46.4
Length on ARV medications		
1 – 2 years	26	18.6
> 2 – 4 years	28	20.0
5 – 7 years	27	19.3
> 7 years	59	42.1
Consistent with ARV		
Yes	129	92.1
No	11	7.9
Method of HIV discovery		
Sickness	88	62.9
Voluntary HCT	45	32.1
Mandated test without counselling	7	5.0
Viral load		
< 100cells/ml	77	55.0
100-1000cells/ml	50	35.7
1001-10000cells/ml	4	2.9
> 10000cells/ml	9	6.4

HCT – HIV counselling and testing

Table 2: Bivariate analysis showing socio-demographic characteristics/HIV-related characteristics and depression among adolescents living with HIV

Variables	Depression		Total n=140 n(%)	Chi Square (d.f)	p-value
	Yes n=20 n (%)	No n=120 n (%)			
Age category					
10 – 12 years	2 (4.0)	48 (96.0)	50 (100.0)		
13 – 15 years	6 (13.3)	39 (86.7)	45 (100.0)	22.501	0.0068*
16 – 19 years	12 (26.7)	33 (73.3)	45 (100.0)	(d.f=2)	
Sex					
Male	11 (17.5)	52 (82.5)	63 (100.0)	0.9428	0.3316
Female	9 (11.7)	68 (88.3)	77 (100.0)	(d.f=1)	
Educational level					
Primary	1 (3.7)	26 (96.3)	27 (100.0)		
Secondary	3 (5.4)	53 (94.6)	56 (100.0)	14.960	0.0006*
Tertiary	16 (28.1)	41 (71.9)	57 (100.0)	(d.f=2)	
Socio-economic status					
High	13 (18.8)	56 (81.2)	69 (100.0)		
Middle	6 (18.8)	26 (81.2)	32 (100.0)	6.066	0.0482*
Low	1 (2.6)	38 (97.4)	39 (100.0)	(d.f=2)	
Duration of living with HIV					
1 – 2 years	2 (15.4)	11 (84.6)	13 (100.0)		
> 2 – 4 years	2 (11.1)	16 (88.9)	18 (100.0)		
5 – 7 years	0 (0.0)	20(100.0)	20 (100.0)	4.7038	0.3191
> 7 years	5 (20.8)	19 (79.2)	24 (100.0)	(d.f=4)	
Fr (p[=om birth	11 (16.9)	54 (83.1)	65 (100.0)		
Length on ARV medications					
1 – 2 years	5 (19.2)	21 (80.8)	26 (100.0)		
> 2 – 4 years	2 (7.1)	26 (92.9)	28 (100.0)	1.7373	0.6287
5 – 7 years	4 (14.8)	23 (85.2)	27 (100.0)	(d.f=3)	
> 7 years	9 (15.3)	50 (84.7)	59 (100.0)		
Consistent with ARV					
Yes	17 (13.2)	112 (86.8)	129 (100.0)	1.6444	0.1997
No	3 (27.3)	8 (72.7)	11 (100.0)	(d.f=1)	
Method of HIV discovery					
Sickness	10 (11.4)	78 (88.6)	88 (100.0)		
Voluntary HCT	10 (22.2)	35 (77.8)	45 (100.0)	4.0951	0.1290
Mandated test without counselling	0 (0.0)	7 (100.0)	7 (100.0)	(d.f=2)	
Viral load					
< 100cells/ml	8 (10.4)	69 (89.6)	77 (100.0)		
100-1000cells/ml	11 (22.0)	39 (78.0)	50 (100.0)	4.1253	0.2482
1001-10000cells/ml	0 (0.0)	4 (100.0)	4 (100.0)	(d.f=3)	
> 10000cells/ml	1 (11.1)	8 (88.9)	9 (100.0)		

*Statistically significant d.f=degree of freedom

Table 3: Multivariate analysis showing socio-demographic characteristics/HIV-related characteristics and depression among adolescents living with HIV

Factors	Coefficient (B)	Adjusted Odds ratio (AOR)	95% CI	p-value
Age (≥16/<16years)	1.4813	4.40	1.42 – 13.70	0.0102*
Sex (Male/Female)	0.4681	1.60	0.55 – 4.61	0.3867
Socio-economic status	0.7285	2.07	0.93 – 4.63	0.0749
Duration of HIV	0.2774	1.32	0.86 – 2.04	0.2102
Consistent with HIV (No/Yes)	1.2380	3.50	0.68 – 17.59	0.1364
Viral load	0.2271	1.26	0.70 – 2.25	0.4440
Social support	-0.0584	0.94	0.90 – 0.99	0.0248*

*Statistically significant CI – Confidence Interval