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PEDIATRICS | RESEARCH ARTICLE

Psychological complications associated with HIV/AIDS infection among children in South-South Nigeria, sub-Saharan Africa

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Abstract: To examine the prevalence of depression and suicidality among children with HIV infection and determine the clinical characteristics associated with depression, we interviewed 150 children and adolescent with HIV and without HIV infection respectively using Major Depressive and Suicidality Modules of Mini-International Neuropsychiatric Interview for children and adolescents at a Paediatric Outpatient Clinic of a Teaching Hospital. The prevalence of depression was higher among children and adolescents with HIV infection than those without HIV infection ($p = 0.01$). Older age group (14–16 years), children who experienced academic failure, the orphans, and those who had more than one hospitalization were more likely to experience depression. The higher prevalence of depression among children and adolescents with HIV infection compared to the control group indicates a need to incorporate psychiatric liaison services into management of children with HIV/AIDS.

Subjects: Behavioral Sciences; Health and Social Care; Medicine, Dentistry, Nursing & Allied Health

Keywords: psychological issues; children; HIV/AIDS infection; Nigeria; Sub-Saharan Africa

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PUBLIC INTEREST STATEMENT

There is poor attention to mental health service needs of children and adolescents in sub-Saharan Africa. Appropriate paediatric consultation liaison services need to be developed in sub-Saharan Africa to cater to the mental health needs of children with chronic physical health problems. Hence, the report of this article highlighting the enormous psychological complications associated with paediatric HIV/AIDS in South-South Nigeria, sub-Saharan Africa.

1. Introduction

In 2009, approximately 2.5 million children below 15 years were living with human immunodeficiency virus (HIV) around the world, with the vast majority of 2.3 million in Sub-Saharan Africa (WHO, UNAID and UNICEF, 2010). According to the 2009 Universal Access Report, Nigeria accounted for 30% of the global burden of mother to child transmission of HIV and 10% of paediatric HIV and acquired immunodeficiency syndrome (AIDS) (World Health Organization [WHO], 2009). A study indicated that 36% of infants living with HIV have a median life expectancy of 16 years (Ferrand et al., 2009). Advances in HIV testing for exposed children and provision of antiretroviral therapy (ART) enable children living with HIV to be healthier and live longer (Gortmaker et al., 2001; Mellins, Brackis-Cott, Dolezal, & Abrams, 2004). For these children, HIV is a chronic disease requiring a lifetime of continuous treatment, care and support to ensure their physical and mental development, as well as emotional and psychological wellbeing. As children live longer with chronic HIV infection, there is greater risk of increased prevalence and severity of psychosocial complications. HIV/AIDS is associated with a multitude of psychosocial problems that may induce psychiatric disorders in the infected child (Musisi, Kinyanda, Nakasujja, & Nakigudde, 2007). These problems include chronic physical ill health, orphanhood, frequent bereavements (parents and siblings), stigmatization, physical and sexual abuse (Kamau, Kuria, Mathai, Atwoli, & Kangethe, 2012; Musisi & Kinyanda, 2009; Musisi et al., 2007).

1.1. Prevalence of depression among children and adolescents with HIV infection

Some studies have been carried out on psychiatric morbidity among children infected with HIV. Some of the psychiatric disorders and behavioural problems reported from these studies are major depression, attention deficit hyperactivity disorder, anxiety disorders, oppositional defiant disorder, somatization disorders, social phobia, seizures and mania (Kamau et al., 2012; Musisi & Kinyanda, 2009; Scharko, 2006). Denise et al. (2004) reported that the prevalence of psychiatric cases in children with HIV was higher compared to children in general pediatric population (6.17 vs. 1.7 cases per 1,000 person-years). The authors also reported that 50% of those admitted had depression. Misdrahi et al. (2004) in a study involving 17 HIV positive adolescents reported that the most frequent psychiatric diagnosis in children and adolescents with HIV was major depressive disorder (47%). Scharko reviewed eight studies that determined the prevalence of psychiatric disorders among adolescents with HIV infection and reported that 25% had depression (Scharko, 2006).

Also Pao et al. (2000) evaluated 34 HIV infected adolescents attending an urban clinic for current and lifetime rates of psychiatric disorders. The study reported that 44% of the participants had a diagnosis of ongoing depression. Furthermore, persons with HIV infection are nearly twice as likely as those who are HIV negative to experience depression (Ciesla & Roberts, 2001). A cross sectional study among 82 HIV positive adolescents who knew their HIV status and attending a specialized HIV/AIDS care centre in Kampala Uganda identified specific psychiatric disorders as anxiety 45.6%, depression 40.8%, somatization 18.0%, seizure disorders 8.4%, mania 1.2% and HIV-associated progressive encephalopathy 4.8% (Musisi & Kinyanda, 2009). Another study was done among children and adolescents infected with HIV and attending a comprehensive HIV care clinic in Kenya. One hundred and sixty-two children and adolescents between 6 and 18 years were interviewed. Seventy-nine (48.8%) of the participants were found to have psychiatric morbidity, and the prevalence of major depression was 17.8% (Kamau et al., 2012). However, contrary to some previous studies, Lee, Chhabra, and Oberdorfer (2011) carried out a comparative cross sectional study among HIV infected teens and HIV negative controls. Among HIV infected teens (cases), 27.8% screened positive for depression compared to 43% of controls.

1.2. Prevalence of suicidal ideation and attempts in children and adolescents with HIV infection

It is established that in the context of HIV infection, there is the risk of suicide (Maldonado, Fernandez, Levy, et al., 2000; McKeegney & Dowd, 1992). Denise et al. (2004) reported that 6 (19%) out of 32 children hospitalized because of psychiatric illnesses had suicidal ideation/attempts. Another study also reported that among children and adolescents attending comprehensive HIV care clinic in

Kenya, 18% had suicidal risk. Suicidality was noted to increase with age and lowest prevalence of 4.6% in the youngest age group and highest of 25% in the oldest age group. None of the children and adolescents in the study admitted to any suicidal attempts (Kamau et al., 2012). Musisi and Kinyanda (2009) in a study of emotional and behavioural disorders among adolescents attending a specialized HIV/AIDS care centre in Kampala, Uganda reported that 17.1% had attempted suicide within the last 12 months. Chikezie, Otakpor, Kuteyi, and James (2012) studied adult HIV infected patients attending a comprehensive HIV clinic in Benin, Nigeria and reported a prevalence 34% of suicidal ideation compared to 4% in normal population with 9.3% attempting suicide in the preceding six months prior to the study. Higher suicide risks in HIV/AIDS infected people have been reported in comparison to the general population which improved with better treatment (Robertson, Parsons, van der Horst, & Hall, 2006; Schlebusch & Vawda, 2010). According to a Youth Risk Behavior Surveillance data, 16.9% of US high school students had (at some point during the previous 12 months) made a plan to attempt suicide, and 8.4% reported at least one actual attempt (Eaton et al., 2006). Omigbodun, Dogra, and Esan (2008) got 1,429 youths aged 10–17 years to complete the Nigeria version of the Global School Health Questionnaire (GSHQ) and the Diagnostic Predictive Scale (DPS) for youths (suicidal behaviour questions) in a classroom setting. The study showed that over 20% had suicidal ideation and approximately 12% had attempted suicide in the previous year. Bakare, Omigbodun, Kuteyi, Meremikwu, and Agomoh (2008) in a study that involved children with chronic medical conditions attending specialist outpatient clinic, reported that 20% of sickle cell disease patients and 11.1% of those with juvenile diabetes mellitus patients had suicidal ideation compared to the healthy participants who reported no suicidal ideation.

1.3. Clinical variables associated with depression in children with HIV infection

There is paucity of information on clinical variables associated with depression in children with HIV infection. Most of the studies found in the literature were on adult populations with HIV/AIDS. A study on people living with HIV/AIDS in Peru demonstrated the following correlates of depression: HIV-related stigma, poverty, socioeconomic vulnerability including food scarcity, less than secondary school educational level, and not having disclosed seropositivity to their partners. Length of time on ART also correlated with depression (Wu et al., 2008). Among women in Zimbabwe, depression was less common among those who were on ART for 13 months compared to those who were not receiving treatment (Patel et al., 2009). Kamau et al. (2012) found that major depression was significantly associated with immune suppression (CD4 count less than 350 cells/mm³) and male gender which was in contrast to some studies that found depression to be more prevalent in females (Costello, Erkanli, & Angold, 2006; Hankin et al., 1998). Misdrahi et al. (2004) also reported that there was a strong association between low percentage of CD4 count and the appearance of psychiatric complications. However, Denise et al. (2004) reported that disease status, as measured by CD4 count and viral load, was not associated with first psychiatric hospitalizations. Zorrilla, McKay, Luborsky, and Schmidt (1996) reviewed 19 studies that examined the relationship between depressive symptoms and HIV progression and failed to find a relationship except for an increase in the reports of disease symptoms. Depression and suicidality may have very considerable impact on the quality of life of children and adolescents with HIV/AIDS.

This study assessed the prevalence of major depression and suicidality with associated clinical characteristics among children and adolescents with HIV/AIDS and also children and adolescents who tested negative to HIV/AIDS (control). The authors hypothesized there were no differences in the prevalence of depression and suicidal behaviour among the study group and the control. The authors also hypothesized that there were no differences in the socio-demographic and clinical variables of children with HIV infection who have depression and those who do not have depression. Findings from this study would provide insight into the magnitude of psychological complications among children and adolescents with HIV infection with a view to improving early recognition and institution of appropriate holistic interventions.

2. Methods

2.1. Location of study

This cross sectional study was carried out at Paediatric Outpatient Clinic of University of Calabar Teaching Hospital (UCTH), Calabar Cross River State in South-South Nigeria. Though the centre is a tertiary health care facility, it offers primary healthcare services.

2.2. Participants

The study group consisted of 75 consecutive attendees (31 boys and 44 girls) of the comprehensive HIV care clinic, between the ages of 8 and 16 years and diagnosed as having HIV infection by rapid antibody test. Participants were recruited whether or not they were on the combined antiretroviral medications. Seventy-five children who were not reactive to rapid antibody tests (HIV negative) and were attending children outpatient clinic of the same hospital during the study period formed the control group. The controls were matched for age and sex with the study group. Children and adolescents who were too ill and those whose parents/caregivers objected to giving written informed consent were excluded from this study.

2.3. Instruments

2.3.1. Socio-demographic and clinical characteristics questionnaire

A socio-demographic questionnaire designed by the authors was used to obtain socio-demographic data and clinical variables were obtained from medical records. These included age, sex, ethnic background, family structure at home, orphan status, academic performance, current immune status (CD4 count), HIV clinical stage, whether on highly active antiretroviral therapy (HAART) and number of previous hospitalizations.

2.3.2. MINI-International Neuropsychiatric Interview for children and adolescents (MINI-Kid)

The MINI-Kid is a brief structured interview for the major axis 1 disorders for children and adolescents in DSM-IV and ICD-10 (Sheehan, Shytle, Milo, Lecrubier, & Hergueta, 2006). MINI-Kid is a diagnostic instrument; it makes diagnoses based on criteria specified in DSM-IV and ICD-10. Further assessment of children diagnosed with depression and having suicidal thoughts was done by qualified clinicians. It comes in 2 versions- the parent version for children aged 6–10 years and the youth self report version for those aged between 11 and 18 years. Depressive and suicidality modules were used and it took an average 15 min to administer for each child. There are four questions in the major depressive episode module labelled A1–A4 and nine questions in the suicidality module labelled B1–B9. Questions in both modules have NO or YES response option. The MINI-Kid generates reliable and valid psychiatric diagnoses for children and adolescents because it is based on ICD 10 and DSM IV TR diagnostic criteria (See Appendix 1).

2.4. Procedure

All eligible consecutive attendees of outpatient clinic and their primary caregivers/parents were given information on the purpose of the study, the implications of participation, the informed consent process, use of the results and confidentiality of the data and information regarding their rights to refuse participation. The consecutive attendees were recruited until sample size of 75 children and adolescent with HIV infection was met. Interview was held in one of the consulting rooms at the UCTH outpatient clinic and was conducted by the authors. Socio-demographic Questionnaire was used to obtain socio-demographic data. Current immune status (recent CD4 count) and other clinical variables were obtained from the children's case notes. MINI Kid Neuropsychiatric structured diagnostic interview was used to assess depression and suicidality. Seventy-five children who met the criteria for this study but not reactive to rapid antibody tests (HIV negative) formed the control group. This study was conducted between August, 2013 and July, 2014. Those who had psychiatric morbidity were given referral letters to psychiatric unit of UCTH Calabar for further assessment and treatment.

2.5. Ethical issues

Permission for this study was obtained from Ethics and Research Committee of University of Calabar Teaching Hospital, (UCTH), Calabar. Also written informed consent of parents/caregivers of the children who participated in the study was obtained.

2.6. Statistical analysis

The Statistical Package for Social Sciences version 16 (SPSS, 2007) was used for analysis and simple descriptive statistics were used to present the basic characteristics of the participants. χ^2 statistics was used to compare categorical variables and p -value of < 0.05 was accepted as significant.

3. Results

3.1. Clinical characteristics of the children

A total of 150 participants were interviewed. Out of these participants, 75 subjects were children and adolescents with HIV infection and the control group consisted of 75 participants who were HIV negative. Each group consisted of 31 (41.3%) males and 44 (58.7%) females. The age range of the study participants was from 8 to 16 years, and the mean age of children with HIV/AIDS was 10.63 ± 2.38 years, while the control group had a mean age of 10.91 ± 2.48 years. Fifty-seven (76%) of the children in the study group were in primary school, while in the control group, 48 (64.0%) were in primary school. In the study group 61 (81.3%) had not repeated any class and 70 (93.3%) had not repeated any class in the control group. Fifty (66.7%) of the children with HIV infection lived with their biological parents. While in the control group 64 (85.3%) lived with their biological parents. Thirty-four (45.3%) of the children with HIV infection had both parents alive and in the control group, 65 (86.7%) had both parents alive. Nine (12.0%) of the children with HIV infection were in stage 1 of the HIV infection, 18 (24.0%) in stage 2, 40 (53.3%) were in stage 3 and 8 (10.7%) were in stage 4. Twenty-eight (37.3%) had CD4 Count of less than 350 cells/mm³ and 47 (62.7%) had CD4 Count of 350 cells/mm³ or more. Sixty-seven (89.3%) of the children with HIV infection were on HAART at the time of the study and 8 (10.7%) had not been commenced on antiretroviral medication at the time of the study. Table 1 showed demographic characteristics of the children.

3.2. Prevalence and distribution of depression among children and adolescents

Fifteen (20.0%) of the children and adolescents with HIV infection had depression and in the control group, 5(6.7%) were diagnosed with depression ($\chi^2 = 6.00, p = 0.01$). Table 2 shows the prevalence and distribution of depression among the children and adolescents.

3.3. Association between clinical characteristics of children and adolescents with HIV infection and depression

Clinical characteristics of age group, family structure at home, orphan status, academic performance and number of hospitalizations prior to study showed statistical significant association with depression in children and adolescents with HIV/ AIDS. Table 3 shows association between clinical characteristics of children and adolescents with HIV infection and depression.

3.4. Suicidal ideation and suicidal attempts

Twelve (16.0%) of the children and adolescents with HIV infection had suicidal ideation while in the control group, 5 (6.7%) had suicidal ideation ($\chi^2 = 3.34, df = 1, p = 0.07$). One (1.3%) of the children and adolescents with HIV infection had attempted to kill him/herself while in the control none of them had made attempt to kill himself/herself. Table 4 shows the distribution of suicidal ideation and attempts in the study and control groups.

Table 1. Socio-demographic and clinical characteristics of the children and adolescents

Variables	Children with HIV	Children without HIV	χ^2	df	p-value
		N (%)	N (%)		
<i>Age (years)</i>					
Mean	10.63 ± 2.38	10.91 ± 2.48			
<i>Gender</i>					
Male	31 (41.3%)	31 (41.3%)	0.00	1	1.00
Female	44 (58.7%)	44 (58.7%)			
<i>Education</i>					
No educ	1 (1.3%)	0 (0%)	4.69	3	0.20
Primary	57 (76%)	48 (64%)			
Secondary	15 (20%)	25 (33.3%)			
Post sec	2 (2.7%)	2 (2.7%)			
<i>Academic performance</i>					
Repeated class	13 (17.3%)	5 (6.7%)	5.69	2	0.06
Never repeat	61 (81.3%)	70 (93.3%)			
<i>Family structure at home</i>					
Parents	50 (66.7%)	64 (85.3%)	17.23	2	0.02
Grandparents	7 (9.3%)	3 (4%)			
Relatives	18 (24%)	8 (10.7)			
<i>Orphan status</i>					
2 parents alive	34 (45.3%)	65 (86.7%)	30.66	2	<0.01
2 parents dead	17 (22.7%)	3 (4%)			
1 parent dead	24 (32%)	7 (9.3%)			
<i>HIV clinical stage</i>					
1		9 (12%)			
2		18 (24%)			
3		40 (53.3%)			
4		8 (10.7%)			
<i>Current CD4 Count (cells/mm³)</i>					
Mean		679.87 ± 472.32			
<350		28 (37.3%)			
≥350		47 (62.7%)			
<i>HAART</i>					
Yes		67 (89.3%)			
No		8(10.7%)			

Table 2. Depression diagnosis in the study and control groups

Assessment (MINI Kids)	Study group	Control group	Total	χ^2	p-value
Depressed	15 (20%)	5 (6.7%)	150	6.00	0.01
Not depressed	60 (80%)	70 (93.3%)			

Table 3. Characteristics of children and adolescents with HIV infection with or without depression

Characteristics	Not depressed	Depressed	χ^2	df	p-value
	N = 60	N = 15			
<i>Gender</i>					
Male	27 (87.1%)	4 (12.9%)	1.73	1	0.19
Female	33 (75.0%)	11 (25.0%)			
<i>Age groups (years)</i>					
8-10	42 (95.5%)	2 (4.5%)	31.40	2	<0.01
11-13	16 (84.2%)	3 (15.8%)			
14-16	2 (16.7%)	10 (83.3%)			
<i>Academic failure</i>					
Yes	4 (30.8%)	9 (69.2%)	19.79	2	<0.01
No	55 (90.2%)	6 (9.8%)			
<i>Family structure</i>					
Parent	47 (94.0%)	3 (6.0%)	19.26	2	<0.01
Grandparent	5 (71.4%)	2 (28.6%)			
Relatives	8 (44.4%)	10 (55.5%)			
<i>Orphan</i>					
Both alive	32 (94.1%)	2 (5.9%)	14.71	2	<0.01
Both dead	8 (47.1%)	9 (52.9%)			
One parent	20 (83.3%)	4 (16.7%)			
<i>Clinical stage</i>					
1	6 (66.7%)	3 (33.3%)	2.98	3	0.40
2	15 (83.3%)	3 (16.7%)			
3	34 (85.0%)	6 (15.0%)			
4	5 (62.5%)	3 (37.5%)			
Mean CD4 count	654.00 ± 462.47	783.33 ± 513.30	t = 0.94	73	0.35
<i>HAART</i>					
Yes	54 (80.6%)	13 (19.4%)	0.13	1	1.00
No	6 (75.0%)	2 (25.0%)			
<i>Hospitalizations</i>					
0	46 (88.5%)	6 (11.5%)	7.48	2	0.02
1	11 (64.7%)	6 (35.3%)			
>1	3 (50.0%)	3 (50.0%)			

Table 4. Suicidal behaviour in the study and control groups

Variables	Study group	Control group	Total	χ^2	df	p-value
Suicidal ideation	12 (16.0%)	5 (6.7%)	150	3.34	1	0.07
Suicidal attempts	1 (1.3%)	0 (0.0%)	150	1.39	1	0.24

4. Discussion

This cross sectional study of Nigerian children living with HIV/AIDS and those without HIV/AIDS showed that psychological complications including major depressive disorder and its associated clinical characteristics like being orphaned, change in family structure at home, age of the child and number of hospitalizations (12 months prior to the study period) are important issues.

4.1. Prevalence of depression

The prevalence of depression in children and adolescents with HIV infection was 20% while that of the control was 6.7%. The prevalence in this study was comparable to that of Kamau et al. (2012) who found a prevalence of 17.8% in children and adolescent with HIV infection.

This finding also agreed with that of Scharko (2006) in a meta-analysis of eight studies that determined the prevalence of psychiatric disorders among adolescents with HIV infection and reported 25% prevalence of depression among the adolescents.

The finding in this study was however lower than three studies that reported prevalence of depression among adolescents with HIV infection to be 40.8, 47 and 68% respectively (Misdrahi et al., 2004; Musisi & Kinyanda, 2009; Pao et al., 2000). This wide range of prevalence of depression among children and adolescents with HIV infection may be due to variations in methodology and socio-demographic factors.

Among the children and adolescents who were HIV negative in this study, the prevalence of depression was 6.7%. This finding was consistent with a previous study of depression at Ibadan, Nigeria among children and adolescents attending paediatric outpatient clinic, which reported a depression prevalence of 6.0% (Gureje et al., 1994).

4.2. Factors associated with depression among children with HIV/AIDS

4.2.1. Age and depression

Majority of the children aged 14–16 years had depression, representing 83.3% of children with depression. This was consistent with previous literature findings which supported that prevalence of depression increased from childhood to adolescence for HIV and normal populations (Costello et al., 2006; Jellinek & Snyder, 1998; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993). This was an expected finding from a cognitive development point of view as 14–16 year old children would have developed abstract thinking, logical reasoning and understood what it meant to live with a lifelong HIV infection with psychosocial implications of stigma and discrimination. The implication of this finding is that special attention needs to be paid to the children in this age group when assessing the psychological complications and providing interventions following HIV infection.

Our finding is in contrast to that of Kamau et al. (2012) conducted in a comprehensive HIV care clinic in Kenya among 6–18 year old children. The authors reported that age of the children was not associated with psychiatric morbidity including depression in their studied population.

4.2.2. Academic performance and depression

This study also found that children and adolescents with HIV infection who repeated classes were more likely to experience depression than those who had not repeated any class. This was similar to a previous study by Musisi and Kinyanda (2009) which reported that being out of the school was associated with significant psychological distress. This also agrees with a study carried out in a special group of children in school which noted that psychological distress including anxiety and depression were associated with academic failure (Musisi et al., 2007). However, academic failure may also be a distressing experience to children in this environment where much value is placed on academic excellence.

4.2.3. Family structure and depression

In this study family structure at home was found to have a significant association with depression. Those who lived with parents (6.0%) were less likely to develop depression than those who stayed with relatives (55.0%). This was similar to finding in a study by Kinyanda, Kizza, Abbo, Ndyabangi, and Levin (2013) in north eastern rural Uganda. The study reported less depression in children living with biological parents. This may be so because biological parents tend to be more protective and nurturing with their children. In contrast, a previous study had noted that there was no association between who the child lived with and depression (Musisi & Kinyanda, 2009).

4.2.4. Orphan status and depression

In this study, children and adolescents with HIV infection who were orphans (69.6%) were more likely to experience depression than non orphans (5.9%), with those who had lost both parents more likely to experience depression. Our finding was similar to a study in rural Uganda among AIDS orphans, which reported that orphans had significant higher scores in Beck Youth Depression Inventory than non orphans (Atwine, Cantor-Graae, & Bajunirwe, 2005). The study in Uganda was community based while this study was hospital based. Older children are more grieved by the loss of their parents. Unlike adults, younger children often do not feel the full impact of the loss, simply because they may not immediately understand the finality of death. This prevents them from going through the grief process which is necessary for recovery. Therefore, the children are at risk of growing up with unresolved negative emotions which may be expressed as depression.

4.2.5. Number of hospitalizations (12 months prior to the study) and depression

Children who had more hospitalizations were more likely to experience depression than those with no hospital admissions prior to the study. Our finding is similar to a study which reported that having knowledge of being HIV positive and significant life events were both associated with increased risk of hospitalizations and psychiatric problems (Denise et al., 2004). Repeated hospitalization could constitute psychological distress to these children and their parents or guardians.

4.3. Prevalence of suicidal behaviour in the study and control groups

The prevalence of suicidal ideation among the children and adolescents with HIV infection was 16.0%. This was similar to two previous studies among children and adolescents with HIV infection which reported lifetime prevalence of 18 and 19% of suicidal ideations respectively (Denise et al., 2004; Kamau et al., 2012). Also, Bakare et al. (2008) carried out a study among children and adolescents with sickle cell disease and juvenile diabetes mellitus (chronic medical illnesses like HIV infection) and reported lifetime prevalence of suicidal ideation to be 20 and 11% respectively. One of the children with HIV/AIDS in this study reported lifetime prevalence of suicide attempt and this contrast with the study done by Kamau et al. (2012), which reported that none of their samples attempted suicide in the past. This finding might be attributed to the fact that more than three quarters of their samples were children below 11 years.

The prevalence of suicidal ideation in the control group was 6.7%. This finding was lower compared to the school-based study carried out by Omigbodun et al. (2008). The authors used a stratified sampling technique to identify school children aged 10–17 years. They subsequently administered the Global School Health Questionnaire and Diagnostic Predictive Scale to assess suicidal behaviour. They reported that 20% of their sample experienced suicidal ideation. The difference is that our study was hospital based. Our present finding is however, higher than the previous study carried out by Bakare et al. (2008) also among healthy school children aged 10–18 years. None of the children in that study reported suicidal ideation.

In the present study, none of the children in the control group had attempted suicide, while one of the children with HIV/AIDS reported past episode of suicide attempt.

4.4. Limitations of the study

This is a cross-sectional study and only associations between different variables could be demonstrated. The prevalence of depression and suicidal behaviour reported may not be adequately representative of what obtained in the community where the majority of children and adolescents with HIV infection are living and may not be accessing care.

However, these limitations are unlikely to impact significantly on the implication of the findings of this study, which is the need to incorporate psychiatric liaison services in treatment facilities for children and adolescents with HIV/AIDS.

5. Conclusion

This study found that major depression was significantly higher in children with HIV/AIDS than those without HIV. Older age group (14–16 years), those children who experienced academic failure, those who were orphans and lived with relatives, and those who had more than one hospitalization were more likely to experience depression. The higher prevalence of depression among children and adolescents with HIV infection compared to the control group indicates a pertinent need to incorporate psychiatric liaison services into various health care facilities for children and adolescent with HIV/AIDS in Nigeria.

Authors' contributions

All authors contributed to the conception of the study. KOB, MOB, BEE, MNI were involved in statistical analysis and writing the initial draft of the Manuscript. KOB, MOB, BEE, MNI, AUE, IAB and EEO were involved in revising the manuscript. All authors read and approved the final draft of the manuscript.

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Competing Interests

The authors declare no competing interest.

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Appendix 1.

Major depressive and suicidality modules of MINI kid interviewer instructions

Introducing the interview

The nature and purpose of the interview should be explained to the child or adolescent prior to the interview. A sample introduction is provided below:

I'm going to ask you a lot of questions about yourself. This is so that I can get to know more about you and figure out how to help you. Most of the questions can be answered either "yes" or "no". If you don't understand a word or a question, ask me, and I'll explain it. If you are not sure how to answer a question, don't guess—just tell me you are not sure. Some of the questions may seem weird to you, but try to answer them anyway. It is important that you answer the questions as honestly as you can so that I can help you. Do you have any questions before we start?

For children under 13, we recommend interviewing the parent and the child together. Questions should be directed to the child, but the parent should be encouraged to interject if s/he feels that the child's answers are unclear or inaccurate. The interviewer makes the final decision based on his/her best clinical judgement, whether the child's answers meet the diagnostic criterion in question. With children you will need to use more examples than with adolescents and adults.

General format

The MINI is divided into *modules* identified by letters, each corresponding to a diagnostic category.

- At the beginning of each diagnostic module (except for psychotic disorders module), screening question(s) corresponding to the main criteria of the disorder are presented in a *gray box*.
- At the end of each module, diagnostic box(es) permit the clinician to indicate whether diagnostic criteria are met.

Conventions

Sentences written in «normal font» should be read exactly as written to the patient in order to standardize the assessment of diagnostic criteria.

Sentences written in «CAPITALS» should not be read to the patient. They are instructions for the interviewer to assist in the scoring of the diagnostic algorithms.

Sentences written in «bold» indicate the time frame being investigated. The interviewer should read them as often as necessary. Only symptoms occurring during the time frame indicated should be considered in scoring the responses.

Answers with an arrow above them (↗) indicate that one of the criteria necessary for the diagnosis(es) is not met. In this case, the interviewer should go to the end of the module and circle «NO» in all the diagnostic boxes and move to the next module.

When terms are separated by a *slash (/)* the interviewer should read only those symptoms known to be present in the patient.

Phrases in (parentheses) are clinical examples of the symptom. These may be read to the patient to clarify the question.

Format of the interview

The interview questions are designed to elicit specific diagnostic criteria. The questions should be read verbatim. If the child or adolescent does not understand a particular word or concept, you may explain what it means or give examples that capture its essence. If a child or adolescent is unsure if s/he has a particular symptom, you may ask him/her provide an explanation or example to determine if it matches the criterion being investigated. If an interview item has more than 1 question, the interviewer should pause between questions to allow the child or adolescent time to respond.

Questions about the duration of symptoms are included for diagnoses when the time frame of symptoms is a critical element. Because children may have difficulty estimating time, you may assist them by helping them connect times to significant events in their lives. For example, the starting point for “past year” might relate to a birthday, the end or beginning of a school year, a particular holiday or another annual event.

Rating instructions

All questions must be rated. The rating is done at the right of each question by circling either Yes or No. Clinical judgment by the rater should be used in coding the responses. The rater should ask for examples when necessary, to ensure accurate coding. The child or adolescent should be encouraged to ask for clarification on any question that is not absolutely clear.

The clinician should take each dimension of the question into account (for example, time frame, frequency, severity, and/or alternatives).

Symptoms better accounted for by an organic cause or by the use of alcohol or drugs should not be coded positive in the MINI Kid.

A. Major depressive episode

(Means: go to the diagnostic boxes, circle NO in all diagnostic boxes, and move to the next module)

In the past two weeks:		
A1	Have you felt sad or depressed? Felt down or empty? Felt grouchy or annoyed? IF YES TO ANY, CONTINUE. IF NO TO ALL CODE NO.	
	Have you felt this way, most of the day, nearly every day ?	NO YES
A2	Have you been bored a lot or much less interested in things (Like playing your favorite games)? Have you felt that you couldn't enjoy things? IF YES TO ANY CONTINUE. IF NO TO ALL CODE NO.	
	Have you felt this way, most of the day, nearly every day ?	NO YES
	IS A1 OR A2 CODED YES?	NO YES
A3	In the past two weeks, when you felt depressed/grouchy/uninterested:	
	a. Were you less hungry or more hungry most days? Did you lose or gain weight without trying? [i.e. by $\pm 5\%$ of body weight or ± 8 lbs in the past month]? IF YES TO EITHER, CODE YES	NO YES
	b. Did you have trouble sleeping almost every night ("trouble sleeping" means trouble falling asleep, waking up in the middle of the night, waking up too early or sleeping too much)?	NO YES
	c. Did you talk or move slower than usual? Were you fidgety, restless or couldn't sit still? IF YES TO EITHER, CODE YES	NO YES
	d. Did you feel tired most of the time? Did you feel bad about yourself most of the time? Did you feel guilty most of the time? IF YES TO EITHER, CODE YES	NO YES
	e. Did you have trouble paying attention? Did you have trouble making up your mind? IF YES TO EITHER, CODE YES	NO YES
	f. Did you feel so bad that you wished that you were dead? Did you think about hurting yourself? Did you have thoughts of death? Did you think about killing yourself? IF YES TO ANY, CODE YES	NO YES
	ARE 5 OR MORE ANSWERS (A1, A2 AND A3a-g) CODED YES?	NO YES
		MAJOR DEPRESSIVE EPISODE CURRENT
IF PATIENT HAS CURRENT MAJOR DEPRESSIVE EPISODE CONTINUE TO A4, OTHERWISE MOVE TO MODULE B:		
A4	a. Did you ever have other times of two weeks or more when you felt depressed or not interested in most things, and had most of the problems we just talked about?	NO YES
	b. In between your times of depression, were you completely free of depression for of at least 2 months?	NO YES
		MAJOR DEPRESSIVE EPISODE, RECURRENT

B. Suicidality

(☐☐means : go to the suicide risk current box, circle NO in that box, and move to the next module)

B1	a. Have you ever felt so bad that you wished you were dead?		NO	YES	
	b. Have you ever tried to hurt or to injure yourself?		NO	YES	
	c. Have you ever tried to kill yourself?		NO	YES	
	IF YES TO ANY, CODE YES		NO	YES	
SUICIDE RISK					
In the past month did you:					
B2	Have any accident?		NO	YES	
	IF NO TO B2, SKIP TO B3: IF YES, ASK B2a,:				
B2a	Plan or intend to hurt yourself in that accident?		NO	YES	
	INCLUDE PASSIVE OR ACTIVE INTENT IN YOUR RATING				
	IF NO TO B2a, SKIP TO B3: IF YES, ASK B2b:				
B2b	Did you intend to die as a result of this accident?		NO	YES	
B3	Think you would be better off dead or wish you were dead?		NO	YES	
B4	Want to hurt yourself?		NO	YES	
B5	Think about killing yourself?		NO	YES	
	IF YES, ASK ABOUT THE INTENSITY AND FREQUENCY OF THE SUICIDAL IDEATION:				
	Frequency		Intensity		
	Occasionally	Mild	Can you control these impulses		
	Often	Moderate	and state that you will not act		
	Very often	Severe	on them while in this program?		
B6	Have a plan to kill yourself?		NO	YES	
B7	Take active steps to prepare for injuring yourself or to prepare for killing yourself and expect to die as a result?		NO	YES	
B8	Try to deliberately injure yourself without intending to kill yourself?		NO	YES	
B9	Try to kill yourself		NO	YES	
	Hoped to be rescued/survive ☐				
	Expected/intended to die ☐				
IS AT LEAST 1 OF THE ABOVE (EXCEPT B2) CODED YES?					
IF YES, ADD THE TOTAL NUMBER OF POINTS FOR THE ANSWERS (B1–B9)		NO	YES		
CHECKED “YES” AND SPECIFY THE LEVEL OF SUICIDE RISK AS INDICATED IN THE DIAGNOSTIC BOX:		SUICIDE RISK CURRENT			
MAKE ANY ADDITIONAL COMMENTS ABOUT YOUR ASSESSMENT OF THIS PATIENT’S CURRENT AND NEAR FUTURE SUICIDE RISK IN THE SPACE BELOW:		1–8 points	Low	☐	
		9–16 points	Moderate	☐	



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